BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE: ODALAREVU

(AUTONOMOUS)

III -B.Tech II-Semester Regular End Examinations (BR23), April-2026

DESIGN AND DRAWING OF STEEL STRUCTURES (CE)

TIME: 3 hours Max. Marks: 70

Question Paper consists of Part-A and Part-B

Answer **ONE** question in **Part-A**

Answer any **THREE** Questions from **Part-B**

Note:IS: 800-2007 & Steel Table is Permitted to use in the Examination hall.

PART–A (28x1=28M)

			Marks	CO	BL
1		Design a built up column with two channels toe to toe to carry a factored load of 2000 kN. Take the effective length as 5.0 m. Draw to scale the cross-section and sectional elevation of the column with lacing details.	28	CO4	BL6
		(OR)			
2		Design a welded plate girder for a simply supported bridge deck beam with a clear span of 18 m. Dead Load including self weight = 20 kNm and imposed load = 10 kNm. Two moving loads of 100 kN each spaced 2 m apart. Assume the top compression flange of the plate girder is restrained laterally and prevented from rotating. Design as an unstiffened plate girder with thick welds. Draw the plan and sectional elevation.	28	CO5	BL6

PART–B (3x14=42M)

			Marks	CO	BL
3	a	What are the advantages of welded connections?	4	CO1	BL2
	b	A tie member of a roof truss consists of 2 ISA 10075, 8 mm. the angles are connected to either side of a 10 mm gusset plates and the member is subjected to a working pull of 300 kN. Design the welded connection.	10	CO1	BL3
4		Design a laterally unsupported I beam with simply supported ends of effective span 6 m subjected to the working load of 40 kN/m. Assume that full torsional and warping restraints are provided at the supports and the load acts on the upper flange which will have destabilizing effect.	14	CO2	BL3
5		Design a suitable double angle section to carry a factored tensile load of 450 kN. The length of the member is 2.9m.Use welded connection. The grade of steel is Fe410.	14	CO3	BL3
6		Design the suitable of steel column and suitable base for an axial compressive factored force of 2000 kN. The effective length of column is 5 m. Use M30 grade concrete pedestal.	14	CO4	BL3
7		Design a gantry girder (without lateral restraint along its span) for an Industrial building to support overhead travelling crane. Use the following data: Centre to centre distance between column (span of gantry) 6 m, Crane capacity 150 kN. Self weight of crane girder (exclude trolley) 160 kN, Self weight of trolley motor and other accessories 40 kN, Minimum hook approach 1.00 m, Distance between wheel centers of trolley 2.00 m, Centre to centre between gantry rails (span of crane) 12 m, Self weight of rail section 250 N/m, Yield strength of steel 250 MPa. Apply necessary design checks.	14	CO5	BL6

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BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE ODALAREVU (AUTONOMOUS)

III B. Tech II-Semester Regular End Examinations (BR23), Highway Engineering(CE)

Time: 3 Hours **Max. Marks: 70**

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

Q.No.		Marks	CO	BL
1.	a) Define NHAI.	2	CO1	L1
	b) List out the recommendations of Jayakar committee.	2	CO1	L1
	c) Differentiate skid and slip.	2	CO2	L2
	d)What are the objectives of providing horizontal curves?	2	CO2	L1
	e) Define PCU.	2	CO3	L1
	f) Define Rotary.	2	CO3	L1
	g) Define impact value of aggregate.	2	CO4	L1
	h) Define Tar and Bitumen.	2	CO4	L1
	i) Define E.S.W.L.	2	CO5	L1
	j) What are the functions of tie and dowel bar.	2	CO5	L1

PART–B (5X10 = 50M)

Q. No	UNIT-I	Marks	CO	BL
2a.	Explain Various road network patterns with neat sketch.	10M	CO1	L3
	OR			
3a.	Write the classification of highways as per Nagpur Plan.	5M	CO1	L1
b.	Explain how Nagpur Plan came into existence and its formula.	5M	CO1	L3
	UNIT-II			
4a.	Derive an equation for overtaking sight distance.	10M	CO2	L3
	OR			
5a.	Write the definitions of super elevation and extra widening	5M	CO2	L1
b.	Calculate the length of transition curve and the shift using the following data. Design speed = 60 kmph; Radius of circular curve = 220 m; Allowable rate of introduction of super elevation (pavement rotated about the centre line) =1 in 150; pavement width including extra widening = 7.0 m	5M	CO2	L3
	UNIT-III			
6 a	What are the common methods of on-street parking. Explain.	5M	CO3	L2
b.	What are the difference between on-street parking and off street -parking	5M	CO3	L1
	OR			
7.	What are the types of traffic signs? Explain with neat sketches.	10M	CO3	L2

UNIT-IV

8.	Explain Marshall method of mix design with detailed procedure.	10M	CO4	L2
	OR			
9.	Explain the penetration test procedure with the help of neat sketch.	10M	CO4	L3
	UNIT-V			
10	State the difference between flexible pavement and rigid pavements in detail.	10M	CO5	L2
	OR			
11a.	Explain the design principles of flexible pavements	5M	CO5	L2
b.	Explain CBR and IRC method of flexible pavements	5M	CO5	L2

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(S) (BR23/BR20/BR18) 01/05/2026

Course code: 23CE6T12

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE ODALAREVU (AUTONOMOUS)

III B. Tech II-Semester Regular End Examinations (BR23), APRIL - 2026

ENVIRONMENTAL ENGINEERING (CE)

Time: 3 Hours **Max. Marks: 70**

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

Q.No.	Questions	Marks	CO	BL
1.a)	Define gravity conduit.	2	CO1	L1
b)	What is meant by pipe joint?	2	CO1	L1
c)	Define BOD and state its significance in water quality assessment.	2	CO2	L2
d)	Define dead-end system.	2	CO2	L1
e)	What is meant by water softening?	2	CO3	L1
f)	Define the terms "Coagulation and flocculation"	2	CO3	L2
g)	Write a short note on sewer appurtenance.	2	CO4	L1
h)	What is skimming tank?	2	CO4	L1
i)	What is sewage reclamation?	2	CO5	L1
j)	Define self-purification of streams and mention any two factors affecting it.	2	CO5	L2

PART–B (5X10 = 50M)

Q. No	Questions	Marks	CO	BL
2.	The population of a town in 1970, 1980, 1990 and 2000 are 28000, 40000, 70000 and 85000 respectively. Find the population in 2040 using arithmetic and geometric methods.	10M	CO1	L3
	OR			
3. a)	What are the various factors affecting "per capita demand"?	5M	CO1	L2
b)	Explain the importance and necessity of protected water supply system.	5M	CO1	L2
4.	Discuss drinking water quality standards as per IS and WHO guidelines.	10M	CO2	L2
	OR			
5.	Explain Hardy Cross method for analysis of distribution networks.	10M	CO2	L3
6. a)	Draw and explain typical treatment flow diagram of a municipal water treatment plant.	5M	CO3	L3
b)	Write a short note on fluoridation and defluoridation.	5M	CO3	L2
	OR			

7.	Design a clarifier to treat 8 MLD of water such that (i) at least 70% of all particles with a settling velocity of 2.5 m/hour or more are removed and (ii) a minimum detention time of 3 hour is provided. Find the % removal in the settling tank of particles having settling velocities of 2.5, 1.0 and 0.20 m/hour.	10M	CO3	L3
8.	Discuss septic tank design, construction, operation and maintenance in detail.	10M	CO4	L3
	OR			
9.	Discuss hydraulics of flow in sanitary sewers and sewer design principles.	10M	CO4	L3
10.	Explain about activated sludge process.	10M	CO5	L3
	OR			
11.	Explain UASB reactor and SBR in detail with neat sketches.	10M	CO5	L2

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Course Code: 23CE6D09

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE: ODALAREVU
(AUTONOMOUS)
III B. Tech II Semester Regular End Examinations (BR23), April 2026
WATER RESOURCES ENGINEERING(CE)

Time: 3 Hours | Max. Marks: 70

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

		Marks	CO	BL
1	a) Define duty and delta .	2	CO1	L1
	b) Explain the concept of crop rotation.	2	CO1	L1
	c) Define balancing depth of cutting.	2	CO1	L1
	d)Find the silt factor when size of silt is 0.1 cm .	2	CO2	L1
	e) What is the difference between aqueduct and super passage.	2	CO2	L2
	f) Write two functions of cross regulator.	2	CO2	L1
	g) What is the difference between weir and barrage.	2	CO3	L1
	h) What is exit gradient and write its equation	2	CO3	L1
	i) What are the classification of dams.	2	CO4	L2
	j)What is dead storage and useful storage	2	CO5	L1

PART–B (5X10 = 50M)

		Marks	CO	BL
2.a)	The following data pertains to healthy growth of a crop: i. Field capacity of soil=30% ii. Permanent wilting percentage=11% iii. Density of soil=1300kg/m^3 iv. Effective depth of root zone=700mm v. Daily consumptive use of water for the given crop=12mm For healthy growth moisture content must not fall below 25% of the water holding capacity between the field capacity and the permanent wilting point. Find the watering interval in days.	5M	CO1	L2
2.b)	What is irrigation and write a importance.	5M	CO1	L2
	OR			
3.a)	Awatercoursecommandsanirrigatedarea1000hectares. Theintensityofirrigationof rice in this area is 70%. The transplantation of rice crop takes 15days and during the transplantation period the total depth of water required by the crop on the fieldis 500mm. During the transplantation period, the useful rain falling on the field is 120mm.Findthedutyofirrigationwaterforthecroponthefielddurингtrans plantation,atthe head of the field and also the head of the water course assuming losses of water to be 20% in the water course. Also calculate the discharge required in the water course	10M	CO1	L3
4.a)	Using Lacey's theory, design an irrigation channel in alluvial soil with the following data: Full supply discharge = 15 cumec, Lacey's silt factor = 0.9 and side slopes: 0.5H:IV	10M	CO2	L3
	OR			
5.a)	Discuss the drawbacks of design of irrigation canal according to Kennedy's method. Compare Kennedy's method and Lacey's method.	10M	CO2	L2

6.a)	What is a cross drainage work? List different types under various considerations and explain them in detail with neat sketches.	10M	CO3	L2
	OR			
7.a)	Explain in detail about Sarada type fall and straight glacis fall with neat sketches.	10M	CO3	L2
8.a)	Explain Khosla's design procedure of independent variables. How do you apply corrections for interference of piles and inclination of floor	10M	CO4	L2
	OR			
9.a)	Explain briefly about process of blighs theory.	10M	CO4	L2
10a)	i).A discharge of 2000 Cumecs has to be passed over an ogee spillway. With acoefficient of discharge of 2.3 at a head of 5.5 m. what should be the effectivelength of the spill-way. Neglect the velocity of approach.	5M	CO5	L2
b)	ii). Explain in dctail thc procedure for the determination of reservoir storage using mass inflow curve	5M	CO5	L2
	OR			
11a)	Explain briefly about types of dams and also write about the gravity dam.	10M	CO5	L4

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Course Code: 23ME5E06

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE: ODALAREVU
(AUTONOMOUS)

(5)

III B.Tech II Semester Regular End Examinations (BR23), April 2026
INDUSTRIAL MANAGEMENT (CE)

Time: 3 hours

Max. Marks: 70

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	Define scientific management.	BL1	1	(2M)
b)	What are Taylor's principles of management?	BL2	1	(2M)
c)	What is the role of an industrial engineer?	BL1	2	(2M)
d)	Define preventive maintenance.	BL2	2	(2M)
e)	What is time study?	BL1	3	(2M)
f)	Define string diagram.	BL2	3	(2M)
g)	What are Therbligs?	BL1	4	(2M)
h)	What is a flow process chart?	BL1	4	(2M)
i)	Define quality control.	BL1	5	(2M)
j)	What is merit rating?	BL2	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.(a)	Explain the concept of management and discuss the functions of management.	BL4	3	(10M)
	(OR)			
3.(a)	Explain plant location factors and their importance in industries.	BL2	2	(10M)
	UNIT-II			
4.(a)	Explain work study techniques used in industrial engineering.	BL3	2	(10M)
	(OR)			
5.(a)	Describe micro motion study and its applications.	BL4	2	(10M)
	UNIT-III			
6.(a)	What is Statistical Quality Control? Explain control charts and their applications.	BL4	3	(10M)
	(OR)			
7.(a)	Explain the concept of zero defects and quality circles in TQM.	BL3	3	(10M)
	UNIT-IV			
8.(a)	Explain the scope and nature of financial management.	BL3	4	(10M)
	(OR)			
9.(a)	Discuss capital budgeting and investment evaluation techniques.	BL2	4	(10M)

UNIT-V

10.(a)	Explain the functions of personnel management.	BL3	5	(10M)

(OR)

11.(a)	Write a detailed note on wage incentive plans and their types.	BL5	5	(10M)

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BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE ODALAREVU
(AUTONOMOUS)
III B.Tech II-Semester Regular End Examinations (BR23), April 2026
REPAIR AND REHABILITATION OF STRUCTURES (CE)

Time: 3 Hours | Max. Marks: 70

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

		Marks	CO	BL
1.	a) Write about Carbonation.	2	CO1	L1
	b) Write the difference between Steel and Glass fibres.	2	CO1	L1
	c) What is stress reduction.	2	CO2	L2
	d) List out the Design Consideration .	2	CO2	L1
	e) What is Near Surface Mounted (NSM) FRP technique?	2	CO3	L2
	f) Define Externally Bonded FRP systems.	2	CO3	L1
	g) Define No Fine Concrete.	2	CO4	L1
	h) What is Fly Ash Concrete	2	CO4	L1
	i) List out the Materials for Self Consolidating Concrete(SCC).	2	CO5	L1
	j) List out the Materials for High Performance Concrete(HPC).	2	CO5	L1

PART–B (5X10 = 50M)

		Marks	CO	BL
	UNIT-I			
2.a)	Explain about Concrete behaviour under Corrosion. Discuss about corrosion mechanism?	10M	CO1	L2
	OR			
3.a)	Explain the Ultrasonic pulse velocity test with neat sketch?	5 M	CO1	L2
3.b)	Explain the Pull out test with neat sketch.	5 M	CO1	L2
	UNIT-II			
4.a)	Explain the Techniques and Design Consideration for strengthening and stabilization.	10M	CO2	L3
	OR			
5.a)	Explain stress reduction Techniques.	5 M	CO2	L3
5.b)	Explain Flexural strengthening Techniques.	5 M	CO2	L3
	UNIT-III			
6.a)	Explain the Externally Bonded FRP strengthening method with its applications and limitations.	6 M	CO3	L2
6.b)	What is meant by bond in structural strengthening?	4 M	CO3	L2
	OR			
7.a)	Explain various bond installation techniques used in structural rehabilitation with neat sketch.	10M	CO3	L2
	UNIT-IV			
8.a)	Define FRC and Explain the factors affecting Fiber Reinforced Concrete (FRC).	5M	CO4	L2
8.b)	Explain the effects of Fly Ash in fresh and Hardened Concrete	5M	CO4	L2
	OR			
9.a)	Explain the Materials and Applications Fiber Reinforced Concrete FRC.	5M	CO4	L3
9.b)	Explain the reaction mechanism Fly Ash Concrete	5M	CO4	L3

UNIT-V

10.a)	Explain Briefly about Materials and properties of High Performance Concrete (HPC).	10M	CO5	L4
	OR			
11.a)	Explain the Materials and properties of Self Consolidating Concrete.	10M	CO5	L4

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Course code: **23EE6T11**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE: ODALAREVU

(Autonomous)

III B.Tech-II Semester Regular End Examination (BR23), April-2026

Electrical Measurements and Instrumentation (EEE)

Times: 3 hours **Max. Marks: 70**

Question Paper consists of Part-A and Part-B

Answer ALL the questions of Part-A

Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART - A

1)a.	Compare scale of PMMC and MI instruments	2M	CO1	BL1
b.	What is controlling torque.	2M	CO1	BL1
c.	List applications of potentiometer.	2M	CO2	BL2
d.	List advantages of electrodynamometer wattmeter.	2M	CO2	BL2
e.	State the use of Wien's bridge.	2M	CO3	BL2
f.	Give the balanced equation for a Maxwell's Bridge.	2M	CO3	BL1
g.	Define a Transducer and classify them.	2M	CO4	BL1
h.	What are the advantages of LVDT.	2M	CO4	BL1
i.	List the advantages of Digital Voltmeters over Analog voltemeters.	2M	CO5	BL1
j.	What is Q-meter.	2M	CO5	BL1

PART - B

2.a)	Describe deflecting, controlling and damping torques in detail.	10M	CO1	BTL2
	OR			
3.a)	Describe the construction and working of Current Transformer and derive the expression for ratio error.	5M	CO1	BTL3
3.b)	Compare PMMC and Moving Iron instruments?	5M	CO1	BTL2
4.a)	Derive the torque equation for an Electrodynamometer type wattmeter.	5M	CO2	BTL3
4.b)	Explain the standardization process of a D.C. Crompton's Potentiometer.	5M	CO2	BTL3
	OR			
5.a)	Explain the construction and principle of operation of a D.C. Crompton's Potentiometer.	10M	CO2	BTL3
6.a)	Describe how Maxwell's Bridge is used to measure inductance and quality factor.	5M	CO3	BTL2
6.b)	Explain measurement of medium resistance using Wheatstone bridge with derivation.	5M	CO3	BTL2
	OR			
7.a)	Describe the measurement of unknown capacitance using a Wien's bridge.	10M	CO3	BTL3
8.a)	Explain construction and working of LVDT with neat diagram.	5M	CO4	BTL2
8.b)	Discuss the working of a Strain Gauge and derive the expression for Gauge Factor.	5M	CO4	BTL3
	OR			
9.a)	Explain piezoelectric transducer with advantages	5M	CO4	BTL2
9.b)	Explain the construction and working of Thermocouples.	5M	CO4	BTL2
10.a)	With a neat block diagram, explain the operation of a Successive Approximation DVM.	5M	CO5	BTL2
10.b)	Explain the working of a Digital Energy Meter with a relevant diagram.	5M	CO5	BTL3
	OR			
11.a)	Describe ramp type DVM with operation	5M	CO5	BTL2
11.b)	Explain how frequency is measured using a Digital Frequency Meter.	5M	CO5	BTL3

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BONAMVENKATACHALAMAYYAENGINEERINGCOLLEGE::ODALAREVU
(AUTONOMOUS)
III B.Tech II Semester Regular End Examinations (BR23),April-2026
Microprocessors and Microcontrollers (EEE)

Time:3hours Max.Marks:70

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

1.a)	What is the difference between a microprocessor and microcontroller?	BL2	1	(2M)
b)	What is memory organization in 8086?	BL3	1	(2M)
c)	Define maximum mode operation.	BL2	2	(2M)
d)	Give examples of assembler directives.	BL1	2	(2M)
e)	Define programmable peripheral interface (8255).	BL2	3	(2M)
f)	List the functions of DMA controller.	BL2	3	(2M)
g)	What are the addressing modes of 8051?	BL1	4	(2M)
h)	What is stack in 8051?	BL2	4	(2M)
i)	What is program memory in PIC?	BL2	5	(2M)
j)	List the features of PIC18 microcontroller.	BL2	5	(2M)

PART–B(5X10= 50M)

UNIT-I

2.(a)	Explain the physical memory organization of 8086 microprocessor.	BL2	1	(5M)
2.(b)	Briefly explain register organization in 8086 microprocessor.	BL2	1	(5M)
	(OR)			
3.(a)	Compare the architectural features of 80286, 80386, 80486 and Pentium processors.	BL3	1	(5M)
3.(b)	Draw and Explain the architecture of 8086 Microprocessor.	BL2	1	(5M)

UNIT-II

4.(a)	Explain the read cycle timing diagram of 8086.	BL2	2	(5M)
4(b)	Write an Assemble language program to find the sum of squares of first ten numbers.	BL3	2	(5M)
	(OR)			
5.(a)	Explain the following instructions: i)HLT (ii)LOCK (iii)CLI (iv)XLAT (v) PUSH (vi) POP with suitable examples. microprocessorwithexample.	BL2	2	(5M)
5.(b)	Discuss the various pins in minimum and maximum mode configurations of 8086.	BL2	2	(5M)

UNIT-III

6.(a)	Explain different modes of operation of 8255 Programmable Peripheral I/O.	BL2	3	(5M)
6.(b)	Illustrate with an example, to interface an A/D converter with 8086 microprocessor.	BL3	3	(5M)

(OR)

7.(a)	Illustrate the need of DMA. Discuss in detail about DMA data transfer method.	BL3	3	(5M)
7.(b)	Describe the procedure to interface stepper motor to 8086 processor.	BL3	3	(5M)

UNIT-IV

8.(a)	Explain the following instructions of 8051 MC with example i) ACALL ii) MOVC iii) JBC iv) CJNE	BL3	4	(5M)
8.(b)	Explain briefly the interrupts of 8051and indicate by their vector address.	BL3	4	(5M)

(OR)

9.(a)	Explain the timers and counters of 8051 microcontroller.	BL3	4	(5M)
9.(b)	Describe the memory organization of 8051 microcontroller.	BL2	4	(5M)

UNIT-V

10.(a)	Describe the register organization of PIC microcontroller.	BL3	5	(5M)
10(b)	Explain the working of I/O ports in PIC microcontroller with an example	BL2	5	(5M)

(OR)

11.(a)	Discuss the programming in C for PIC microcontroller.	BL3	5	(5M)
11(b)	Describe the logical operations used in PIC microcontroller programming with suitable examples.	BL3	5	(5M)

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Course code: **23EE6T13**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU

(Autonomous)

III B.Tech. II Semester Regular End Examination (BR23), April-2026

POWER SYSTEM ANALYSIS (EEE)

Times: 3 hours **Max. Marks: 70**

Question Paper consists of Part-A and Part-B

Answer ALL the questions of Part-A

Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART - A

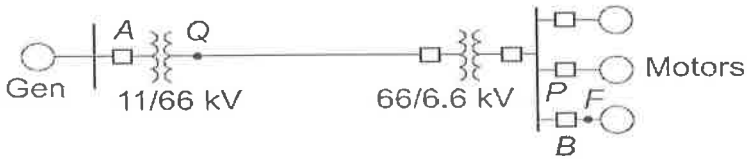
1)a.	Define per unit value and write any two advantages of per unit values.	2M	CO1	BTL2
b.	Define primitive network.	2M	CO1	BTL1
c.	Write the Static Load Flow Equations.	2M	CO2	BTL1
d.	How buses are classified in a power flow study?	2M	CO2	BTL2
e.	What is short circuit capacity?	2M	CO3	BTL2
f.	Define sub-transient reactance.	2M	CO3	BTL1
g.	Define positive sequence impedance.	2M	CO4	BTL1
h.	Draw the zero-sequence network of Y/Δ transformer with neutral ungrounded.	2M	CO4	BTL2
i.	Define critical clearing time and critical clearing angle.	2M	CO5	BTL1
j.	Define Transient stability.	2M	CO5	BTL1

PART - B

2.a)	Write the procedure for obtaining Ybus matrix using singular transformation method.	10M	CO1	BTL3
	OR			
3.a)	Determine the Y-bus matrix by direct inspection method for line specification as mentioned below.	10M	CO1	BTL3

Line p-q	Impedance (p.u)
1 - 2	0.04 + j0.02
1 - 4	0.05 + j0.03
1 - 3	0.025 + j0.06
2 - 4	0.08 + j0.015
3 - 4	0.035 + j0.045

4.a)	Explain the step by step computational procedure for the Gauss-seidal method of load flow studies.	10M	CO2	BTL3
	OR			
5.a)	Explain the step by step computational procedure for the Newton-Raphson method of load flow studies.	10M	CO2	BTL3
6.a)	Explain the step by step procedure for systematic fault analysis for a three phase fault using bus impedance matrix.	10M	CO3	BTL3
	OR			

7.a)	A 25 MVA, 11 kV generator with X_d" = 20% is connected through a transformer, line and a transformer to a bus that supplies three identical motors as shown in Fig. Each motor has X_d" = 25% and X_d' = 30% on a base of 5 MVA, 6.6 kV. The three-phase rating of the step-up transformer is 25 MVA, 11/66 kV with a leakage reactance of 10% and that of the step-down transformer is 25 MVA, 66/6.6 kV with a leakage reactance of 10%. The bus voltage at the motors is 6.6 kV when a three-phase fault occurs at the point F. For the specified fault, Calculate (a) the sub-transient current in the fault,(b) the sub-transient current in the breaker B 	10M	CO3	BTL3
8.a)	What are the various types of faults? Derive the expression of the fault current when an L-G fault occurs at the terminals of an unloaded generator.	10M	CO4	BTL3
	OR			
9.a)	The sequence components of currents in a system are Ia_1=8.334∠-90°, Ia_2=1.6668∠90°, Ia_0=6.6672∠90°. Calculate I_a, I_b and I_c.	10M	CO4	BTL3
10.a)	State and explain equal area criterion. How do you apply equal area criterion to findthe maximum additional load.	10M	CO5	BTL2
	OR			
11.a)	Discuss the methods by which transient stability can be improved.	10M	CO5	BTL2

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BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
III B.Tech II Semester Regular End Examinations (BR23), April 2026
SWITCHGEAR AND PROTECTION (EEE

Time: 3 hours Max. Marks: 70

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

1a.	What is restriking voltage?	2M	CO1	L1
b.	Mention two advantages of SF6 over oil as an insulating medium	2M	CO1	L1
c.	What is IDMT relay?	2M	CO2	L1
d.	Write the torque equation for an induction cup relay.	2M	CO2	L1
e.	List the different type of faults in generators.	2M	CO3	L1
f.	What is percentage differential protection?	2M	CO3	L1
g.	What is carrier current protection?	2M	CO4	L1
h.	Why is distance protection used for transmission lines?	2M	CO4	L3
i.	List the causes of over voltages.	2M	CO5	L1
j.	State objectives of neutral grounding.	2M	CO5	L1

PART–B (5X10 = 50M)

UNIT-I

2.a)	Discuss about the low resistance interruption theory with relevant characteristics.	(5M)
b)	Compare between Air blast and SF6 circuit breakers.	(5M)
	(OR)	
3.a)	Explain current chopping and resistance switching with neat diagrams.	(5M)
b)	Discuss the rate of rise of restricking voltage and explain its importance in arc extinction.	(5M)

UNIT-II

4.a)	Explain classification of relays based on time characteristics.	(5M)
b)	Explain the balanced beam type attracted armature relay with a neat diagram.	(5M)
	(OR)	
5.a)	Derive the torque equation of disc type induction relay.	(5M)
b)	Compare impedance, reactance and mho relays?	(5M)

UNIT-III

6.a)	Describe with neat sketch Mertz-Price scheme of transformer protection.	(6M)
b)	A 3-ϕ, star- delta 11/6.6 KV transformer is protected by means of differential protection system. The 6.6kv delta connected side has CT ratio 600/5. Calculate CT ratio on HT side.	(4M)
	(OR)	
7.a)	Discuss with a neat diagram the application of buchholz relay for the protection of transformer.	(10M)

UNIT-IV

8.a)	What is a static relay? Make a list of the components used in the static relaying scheme	(5M)
b)	Write the advantages and disadvantages of static relays.	(5M)
	(OR)	

9.a) Describe the three zone distance relay protection of the line using impedance relays. (5M)

b) Explain the differential pilot wire method of protection of feeders. (5M)

UNIT-V

10.a) Discuss in detail about valve type arrester with neat diagram. (5M)

b) Discuss in detail about the specifications of surge arresters. (5M)

(OR)

11.a) What are the basic requirements of surge arresters? Differentiate between a surge absorber and a surge arrester. (5M)

b) What is the necessity of neutral earthing? Explain. (5M)

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BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)

III B.Tech II Semester Regular End Examinations (BR23), April-2026

ELECTRIC DRIVES (EEE)

Time: 3 hours | Max. Marks: 70

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	Name the power modulators employed for electrical drives.	1	1	(2M)
b)	Give any two applications of electrical drives.	1	1	(2M)
c)	Draw the circuit diagramof dual converter control of separately excited DC motor.	1	2	(2M)
d)	Write the dynamic equations of separately excited DC motor and express them in state space form.	1	2	(2M)
e)	List the applications of chopper fed DC motor drives.	1	3	(2M)
f)	Sketch the torque – speed characteristics of a chopper fed separately excited DC motor.	1	3	(2M)
g)	Sketch the speed-torque characteristics of a static rotor resistance control of three phase induction motor.	1	4	(2M)
h)	Give any two limitations of AC voltage controller fed three phase induction motor.	1	4	(2M)
i)	List the basic components of a PMSM drive.	1	5	(2M)
j)	Writethe advantages of PMSM.	1	5	(2M)

PART–B (5X10 = 50M)

UNIT-I

2.(a)	With help of block diagram, explain the closed loop speed control of electrical drive by using PLL.	2	1	(5M)
2.(b)	Discuss various types of electric drives.	2	1	(5M)

(OR)

3.(a)	With help of block diagrams, explain the closed loop torque control of electrical drives.	2	1	(5M)
3.(b)	Discuss the advantages and disadvantages of electric drives.	2	1	(5M)

UNIT-II

4.(a)	Explain the operation of a three-phase fully controlled rectifier fed separately excited dc motor drive with neat circuit diagram and torque speed characteristics.	2	2	(10M)

(OR)

5.(a)	A 220 V, 1500 rpm, 50 A separately excited dc motor has an armature resistance of 0.5 Ω, is fed from a circulating current dual converter with ac source voltage(line) = 165 V. Determine converter firing angles for the following operating points. i) Motoring operation at rated motor torque and 750 rpm ii) Braking operation at rated motor torque and 750 rpm iii) Motoring operation at rated motor torque and -750 rpm iv) Braking operation at rated motor torque and -750 rpm	3	2	(10M)

UNIT-III

6.(a)	With a neat circuit diagram, explain the operation of speed control of chopper fed DC series motor. Derive the expression for speed in terms of torque. Also sketch the torque- speed characteristics.	3	3	(5M)
6.(b)	Distinguish between the regenerative braking operation and dynamic braking operation of a DC drive.	3	3	(5M)

(OR)

7.(a)	With a neat circuit diagram, explain the operation of speed control of class E chopper fed DC series motor drive. Also sketch the torque-speed characteristics.	4	3	(10M)

UNIT-IV

8.(a)	Explain the slip power recovery schemes (static scheribus drive) employed for three phase slip ring induction motor.	2	4	(5M)
8.(b)	Compare VSI fed induction motor drive and CSI fed induction motor drive.	3	4	(5M)

(OR)

9.(a)	A 440V, 50 Hz, 6 Pole, Y-connected wound rotor has the following parameters: $Rs = 0.5\ \Omega$, $Rr^1 = 0.4\ \Omega$, $Xs = Xr^1 = 1.2\ \Omega$ & $Xm = 50\ \Omega$. Stator to rotor turns ratio is 3.5. Motor iscontrolled by static rotor resistance control. External resistance is chosen such that the breakdown torque is produced at standstill for a duty ratio of zero. Calculate the value of external resistance. How duty ratio should be varied with speed so that motor accelerates at maximum torque.	4	4	(10M)

UNIT-V

10.(a)	Discuss the basic operation of PMSM drives and explain the different control strategies used.	2	5	(5M)
10.(b)	Compare separately excited synchronous motor control and self-controlled synchronous motor drive.	3	5	(5M)

(OR)

11.(a)	Explain the speed control methods of synchronous motor drives and their practical applications.	2	5	(5M)
11.(b)	Discuss the closed-loop control of synchronous motor drives. Explain the role of feedback in improving performance.	2	5	(5M)

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Course Code: 23AM6E01

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE: ODALAREVU
(AUTONOMOUS)
III B.Tech II Semester Regular End Examinations (BR23), April 2026
ARTIFICAL NEUTRAL NETWORKS AND FUZZY LOGIC (EEE)

Time: 3 hours Max. Marks: 70

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	Give two example from an AI system.	BL1	1	(2M)
b)	Discuss the role of learning tasks and learning strategies in AI.	BL1	1	(2M)
c)	Define an Artificial Neuron. What are the basic components of a McCulloch-Pitts neuron model?	BL1	2	(2M)
d)	What is an activation function? List any two types of activation functions used in neural networks.	BL1	2	(2M)
e)	What is back propagation? State the weight update rule used in a multi-layer network.	BL2	3	(2M)
f)	Define a Radial Basis Function network. How does it differ from an MLP network?	BL2	3	(2M)
g)	Define a fuzzy set. What is a membership function?	BL1	4	(2M)
h)	State De Morgan's laws as applied to fuzzy sets.	BL1	4	(2M)
i)	What is a Fuzzy Logic Controller? Name its three main components.	BL1	5	(2M)
j)	Define fuzzification. What is the role of membership functions in fuzzification?	BL2	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.(a)	Explain the different types of learning tasks in Artificial Intelligence with suitable examples.	BL2	1	(5M)
2.(b)	Discuss the role of knowledge representation in AI systems. Explain any two knowledge representation methods with examples.	BL2	1	(5M)
	(OR)			
3.(a)	Explain the any four differences between human and computer intelligence.	BL3	1	(5M)
3.(b)	Explain the concept of learning process in AI.What are learning strategies?	BL2	1	(5M)

UNIT-II

4.(a)	Explain the McCulloch-Pitts neuron model with a neat diagram.	BL2	2	(5M)
4.(b)	Compare biological and artificial neuron structures with a neat labelled diagram.	BL1	2	(5M)
	(OR)			
5.(a)	Explain the perceptron learning algorithm in detail.	BL3	2	(5M)
5.(b)	Describe the limitations of the perceptron model using the XOR problem.	BL3	2	(5M)

UNIT-III

6.(a)	Explain the back propagation algorithm for a multi-layer feed-forward network. Derive the weight update equations for both hidden and output layers.	BL3	3	(10M)
	(OR)			
7.(a)	Explain the architecture and working principle of Radial Basis Function (RBF) networks. How are the centers selected?	BL2	3	(5M)
7.(b)	Describe the Hopfield recurrent network. Explain the energy function and the convergence property of Hopfield networks.	BL2	3	(5M)

UNIT-IV

8.(a)	Define classical and fuzzy sets. Compare their properties. Explain Union, Intersection, and Complement operations on fuzzy sets with examples.	BL2	4	(5M)
8.(b)	State and explain De Morgan's laws for fuzzy sets. Also explain the algebraic sum and algebraic product operations with examples.	BL2	4	(5M)
	(OR)			
9.(a)	Explain triangular, trapezoidal, and Gaussian membership functions with neat graphs and their defining equations.	BL2	4	(5M)
9.(b)	Define fuzzy relations and cardinality. Explain max-min composition of fuzzy relations with an example.	BL3	4	(5M)

UNIT-V

10.(a)	With a neat block diagram, explain the complete architecture of a Fuzzy Logic Controller (FLC).	BL3	5	(5M)
10.(b)	Explain the rule base development process in an FLC. Illustrate with at least five IF-THEN rules for any system.	BL3	5	(5M)
	(OR)			
11.(a)	Explain the various defuzzification methods? Explain any one method.	BL4	5	(5M)
11.(b)	Explain differnt fuzzy inference methods. How do they differ in processing fuzzy rules? Give one example application.	BL4	5	(5M)

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Course Code: 23ME6109

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
III B.Tech II-Semester Regular End Examinations (BR23), April-2026
Heat Transfer (ME)

Time: 3 hours | Max. Marks: 70

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	State Fourier's law of heat conduction.	2	1	(2M)
b)	Define Thermal conductivity.	2	1	(2M)
c)	Distinguish between conduction resistance and convection resistance.	2	2	(2M)
d)	Explain Forced convection.	1	2	(2M)
e)	Define Nusselt number.	2	3	(2M)
f)	Define Critical thickness.	2	3	(2M)
g)	What is condensation? Why the condenser tubes are placed horizontal.	2	4	(2M)
h)	Classify heat exchanger.	1	4	(2M)
i)	State Stefan-Boltzmann's law.	2	5	(2M)
j)	Define black body and grey body.	2	5	(2M)

PART–B (5X10 = 50M)

UNIT-I

2.(a)	Explain the three modes of heat transfer with neat sketches and examples.	2	1	(5M)
2.(b)	Find the thermal resistance and rate of heat transfer per unit area through a copper plate 70 mm thick, whose one face is maintained at 300°C and other face at 50°C. Take thermal conductivity of copper as 370W/m °C.	3	1	(5M)
	(OR)			
3.(a)	Derive an expression for heat conduction through plane wall and deduce to composite wall.	3	1	(10M)

UNIT-II

4.(a)	A solid copper ball 5 cm in diameter (k=380 W/m·K, ρ=8900 kg/m³, Cp=385 J/kg·K) is initially at 250°C. It is suddenly quenched in a water bath at 30°C with a heat transfer coefficient of 100 W/m²·K. Calculate the time required for the ball to reach 100°C.	3	2	(6M)
4.(b)	Write short note on transient heat conduction.	2	2	(4M)
	(OR)			
5.(a)	Define five dimension less numbers with significance and formula.	3	2	(10M)

UNIT-III

6.(a)	Explain hydrodynamic and thermal boundary layer with reference to flow over flat plate.	3	3	(10M)
	(OR)			
7.(a)	In a straight tube of 60 mm diameter, water is flowing ata velocity of 12 m/s. The tube surface temperature is maintained at 70°C and the flowing water is heated from the inlet temperature 15°C to an outlet temperature of45°C. Taking the physical properties of water at its mean bulk temperature, calculate the following:(i) The heat transfer coefficient from the tube surface to the water,(ii) The heat transferred, and (iii) skin friction coefficient.	3	3	(10M)

UNIT-IV

8.(a)	Derive an expression for Log Mean Temperature Difference (LMTD) of parallel flow heat exchanger.	3	4	(10M)
	(OR)			
9.(a)	Saturated water at 100°C is boiled inside a copper pan having a heating surface area 5×10^{-2} m^2 which is maintained at uniform surface temperature of 110°C. Calculate the surface heat flux and the rate of evaporation.	2	4	(4M)
9.(b)	How are heat exchangers classified explain with neat diagram.	3	4	(6M)

UNIT-V

10(a)	Afurnacewallemitsradiationat2000K.Treatingitasblackbodyradiation,calculate,(i) Monochromatic radiant flux density at 1μm wave length, (ii) Wave length at whichemission is maximum and the corresponding emissive power., (iii) Total emissive power.	3	5	(10M)
	(OR)			
11(a)	Explain the concept of black body with neat diagram.	3	5	(6M)
11(b)	Define absorptivity, reflectivity and transmissivity.	3	5	(4M)

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Course Code: 23ME6T10

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)

III B.Tech II Semester Regular End Examinations (BR23), April 2026

ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING (ME)

Time: 3 hours | Max. Marks: 70

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	List any two real-world applications of AI.	BTL2	1	(2M)
b)	What is a proposition?	BTL2	1	(2M)
c)	What is the role of performance metrics in ML?	BTL2	2	(2M)
d)	Define Support Vector Machine (SVM).	BTL3	2	(2M)
e)	What is the role of the kernel in PCA?	BTL2	3	(2M)
f)	What is dimensionality reduction?	BTL3	3	(2M)
g)	What is back propagation used for?	BTL2	4	(2M)
h)	What is the difference between local and global optima?	BTL3	4	(2M)
i)	What is a deep Boltzmann machine?	BTL2	5	(2M)
j)	Define Random Forest.	BTL2	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.(a)	Define Artificial Intelligence. Explain the four approaches to AI in detail.	BTL2	1	(10M)
	(OR)			
3.(a)	Explain types of agents in detail with architecture and examples.	BTL3	1	(5M)
3.(b)	Compare propositional logic and first-order logic. Discuss inference in first-order logic.	BTL2	1	(5M)
	UNIT-II			
4.(a)	Explain regression and classification problems in detail, highlighting their differences and applications.	BTL3	2	(10M)
	(OR)			
5.(a)	Explain Decision Trees in detail. Discuss entropy, Gini index, and pruning techniques.	BTL3	2	(10M)
	UNIT-III			
6.(a)	Explain the steps involved in the K-means clustering algorithm.	BTL3	3	(10M)
	(OR)			
7.(a)	Derive Maximum Likelihood Estimation for Normal, Binomial, Poisson, and Exponential distributions.	BTL1	3	(5M)
7.(b)	Explain Bayes' theorem	BTL2	3	(5M)
	UNIT-IV			
8.(a)	Explain perceptron model, learning algorithm, and its limitations	BTL3	4	(5M)
8.(b)	Explain Genetic algorithms with examples.	BTL3	4	(5M)
	(OR)			
9.(a)	What are the core components of a CNN and how do they contribute to image recognition?	BTL3	4	(10M)

UNIT-V

10.(a)	Explain Deep Learning and deep generative models in detail.	BTL4	5	(10M)
	(OR)			
11.(a)	Explain auto encoders in detail	BTL4	5	(5M)
11.(b)	Explain model evaluation techniques in detail. Discuss metrics for classification and regression.	BTL4	5	(5M)

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BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
III B.Tech II Semester Regular End Examinations (BR23) April 2026
FINITE ELEMENT METHODS (ME)

Time: 3 hours | Max. Marks: 70

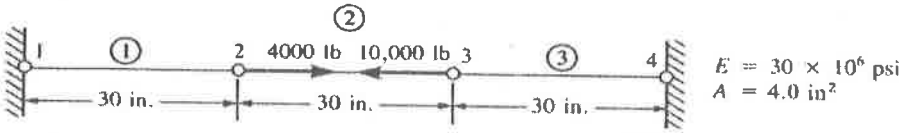
Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	Write any two applications of the finite element method.	2	1	(2M)
b)	Differentiate between local and global coordinates?	2	1	(2M)
c)	What is bandwidth?	2	2	(2M)
d)	Write the convergence requirements.	1	2	(2M)
e)	Difference between truss and beam	2	3	(2M)
f)	Derive the equivalent load vector of the beam element for the UDL case.	3	3	(2M)
g)	What is a lumped mass matrix?	2	4	(2M)
h)	What are the applications of the axisymmetric formulation?	1	4	(2M)
i)	What is dynamic analysis?	1	5	(2M)
j)	Discuss about consistent mass matrix and lumped mass matrix.	2	5	(2M)

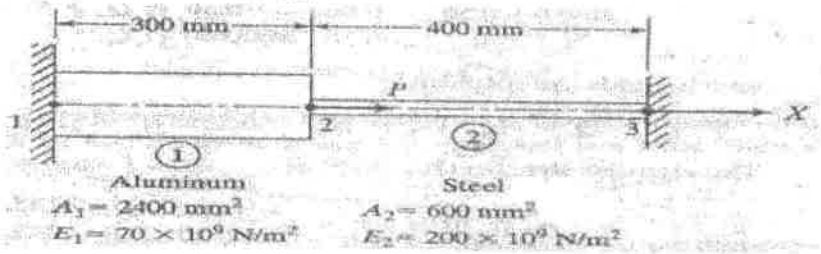
PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.(a)	For the bar assemblages shown in the figure, determine the nodal displacements, the stresses in each element, and the reactions.	3	1	(10M)



(OR)

3.(a)	Discuss about Rayleigh-Ritz method	2	1	(4M)
3.(b)	Consider the following fig. An axial load P=250 KN is applied as shown. Using elimination approach for handling boundary conditions, do the following a) Determine the nodal displacements. b) Determine the stress in each material. c) Determine the reaction forces.	3	1	(6M)



	UNIT-II			
4.(a)	Derive the stiffness matrix of a struss element. Also, derive the load vector.	3	2	(10M)

(OR)

5.(a)	Explain the process of discretization of a structure in the finite element method in detail with suitable illustration	2	2	(6M)
5.(b)	Explain automatic Mesh generationin FEM.	2	2	(4M)

UNIT-III

6.(a)	For the beam shown in the figure 4, determine the slopes at node 2 and node 3 and the vertical deflection at the midpoint of the distributed load.	3	3	(10M)

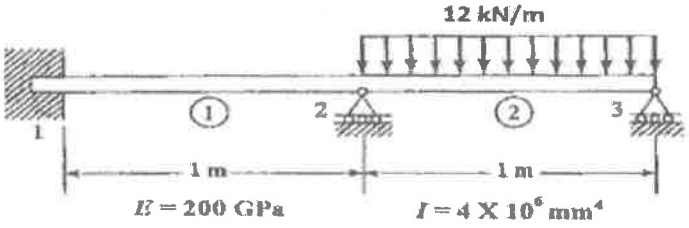


Figure 4

(OR)

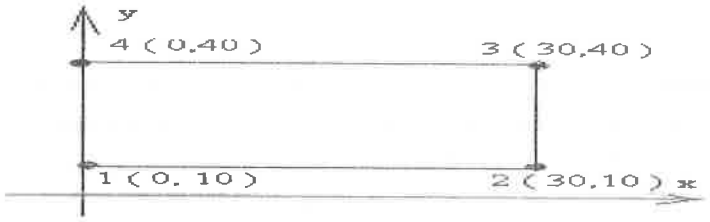
7.(a)	Derive the stiffness matrix of a beam element. Also, derive the load vector for a uniformly distributed loading condition.	3	3	(10M)

UNIT-IV

8.(a)	Derive the strain displacement matrix of two-dimensional CST element.	3	4	(10M)

(OR)

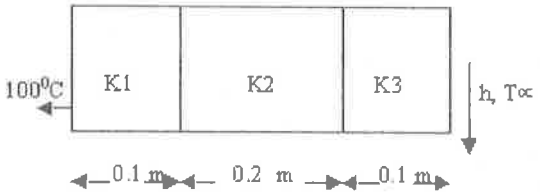
9.(a)	For the element shown in the figure, assemble Jacobian matrix and strain displacement matrix	3	4	(5M)



9.(b)	Derive the shape functions of one dimensional cubic element.	3	4	(5M)

UNIT-V

10.(a)	Estimate the temperature distribution in a 1-dimensionalslab as shown in figure. K_1=25W/mK, K_2=10W/mK, K_3=5W/mK, h=55W/m^{2}K and T∞=20^{0}C.	3	5	(10M)



(OR)

11.(a)	Explain the methods employed to obtain eigenvalues and eigenvectors in axial vibrations of a stepped bar.	2	5	(5M)
11.(b)	Obtain the governing equation of one-dimensional heat conduction.	2	5	(5M)

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BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
III B.Tech II Semester Regular End Examinations (BR23), April-2026
Refrigeration & Air Conditioning (ME)

Time: 3 hours Max. Marks: 70

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

Q.No	Question	BTL	CO	Marks
1.a)	Define the term "Ton of Refrigeration."	1	1	(2M)
1.b)	Define "Relative COP"	1	1	(2M)
1.c)	State the advantages of a vapour compression refrigeration system over air refrigeration system?	1	2	(2M)
1.d)	Describe the principle of the steam jet refrigeration system.	2	2	(2M)
1.e)	Classify refrigerants.	1	3	(2M)
1.f)	List out the components of a vapour absorption refrigeration system.	1	3	(2M)
1.g)	Define "Specific humidity" and "Absolute humidity".	1	4	(2M)
1.h)	Classify air conditioning systems.	2	4	(2M)
1.i)	What is the function of filters in an air conditioning system?	1	5	(2M)
1.j)	Differentiate between a grill and a register	2	5	(2M)

PART–B (5X10 = 50M)

UNIT-I

2.(a)	Describe the Air Refrigerator working on a Bell-Coleman Cycle, and determine the COP of the system.	2	1	(10M)
	(OR)			
3.(a)	An air refrigerator works between the pressure limits of 1 bar and 5 bar. The temperature of the air entering the compressor and expansion cylinder is 10°C and 25°C, respectively. The expansion and compression follow the law PV1.3 = constant. Find the following : 1. The theoretical C.O.P of the refrigerating cycle, 2. If the load on the refrigerating machine is 10TR, find the amount of air circulated per minute through the system, assuming that the actual C.O.P is 50% of the theoretical C.O.P., and 3. The stroke length and piston diameter of a single-acting compressor if the compressor runs at 300 rpm, and the volumetric efficiency is 85%.	3	1	(10M)

UNIT-II

4.(a) A vapour compression refrigerator uses methyl chloride (R-12) as refrigerant, and the liquid evaporates in the evaporator at -15°C. The temperature of this refrigerant at the delivery from the compressor is 15°C when the vapour is condensed at 10°C. Find the coefficient of performance if (i) there is no undercooling, and (ii) the liquid is cooled by 5°C before expansion by throttling. Take specific heat at constant pressure for the superheated vapour as 0.64 kJ/kg K and that for liquid as 0.94 kJ/kg K. The other properties of refrigerant are as follows: 2 2 (10M)

Temperature in (°C)	Enthalpy (kJ/kg)		Entropy (kJ/kg K)	
	Liquid	Vapour	Liquid	Vapour
-15	22.3	180.88	0.0904	0.7051
10	45.4	191.76	0.1750	0.6921

(OR)

5.(a) Explain vapour compression refrigeration system with T–S and P–H diagrams also derive its COP. 3 2 (10M)

UNIT-III

6.(a) Explain desirable physical properties of Refrigerants. 3 3 (10M)

(OR)

7.(a) Derive an expression for the coefficient of performance of an ideal vapour absorption refrigeration system. 2 3 (10M)

UNIT-IV

8.(a) Define Humidification and Dehumidification. Also, explain the method of obtaining humidification and dehumidification. 1 4 (10M)

(OR)

9.(a) Explain clearly about year-round air conditioning and central air conditioning systems with neat sketches. 4 4 (10M)

UNIT-V

10.(a) Discuss various types of air filters, grills, registers, fans, and blowers used in air conditioning systemsand their applications. 2 5 (10M)

(OR)

11.(a) Explain the working principle of a heat pump with a neat diagram. Compare heating mode and cooling mode operations. 3 5 (10M)

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BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU

(AUTONOMOUS)

III B.Tech II Semester Regular End Examinations (BR23), April - 2026

INDUSTRIAL ROBOTICS (ME)

Time: 3 hours Max. Marks: 70

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	Define Industrial Robot as per ISO standard.	1	1	(2M)
b)	List any four types of robot coordinate systems.	2	1	(2M)
c)	Compare electric and hydraulic actuators (any two points).	2	2	(2M)
d)	Define resolution and accuracy of a robot.	1	2	(2M)
e)	Write the homogeneous transformation matrix for rotation about Z-axis.	2	3	(2M)
f)	State the significance of D-H parameters.	3	3	(2M)
g)	What is joint interpolated motion?	2	4	(2M)
h)	Define trajectory planning.	1	4	(2M)
i)	What is machine vision system?	1	5	(2M)
j)	List any two applications of image processing in robotics.	2	5	(2M)

PART–B(5X10=50M)

UNIT-I

2.(a)	Explain classification of industrial robots based on coordinate systems with neat Sketches.	**2**	1	(5M)
2.(b)	Describe the components of an industrial robot with functional block diagram.	**4**	1	(5M)

(OR)

3.(a)	Discuss robot anatomy, degrees of freedom, work volume and types of robot arms with illustrations.	**6**	1	(10M)

UNIT-II

4.(a)	Explain pneumatic, hydraulic and electric actuators. Compare their characteristics and applications.	4	2	(10M)

(OR)

5.(a)	Describe construction and working of stepper motor used in robotics.	2	2	(5M)
5.(b)	Explain encoders and resolvers used as feedback sensors.	2	2	(5M)

UNIT-III

6.(a)	Derive forward kinematic equations of a two-link planar manipulator using D-H convention.	3	3	(10M)

(OR)

7.(a)	Define a Homogeneous transformation matrix. Derive combined transformation matrix for a robotic arm that undergoes a rotation of 'θ' about the Z-axis, followed by a translation of 'a' along the X-axis and 'd' along the Z-axis.	5	3	(10M)

UNIT-IV

8.(a)	Explain trajectory planning. Discuss joint space and Cartesian space trajectory generation.	6	4	(10M)

(OR)

9.(a)	Explain point-to-point and continuous path control in robot programming.	4	4	(5M)
9.(b)	Describe common robot programming languages and features.	4	4	(5M)

UNIT-V

10.(a)	Explain architecture of machine vision system and its role in robotic inspection.	2	5	(10M)

(OR)

11.(a)	Describe image sensing and digitization process in machine vision.	3	5	(5M)
11.(b)	Discuss applications of image processing in industrial robotics.	3	5	(5M)

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Course code: **23CE6E04**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
III Batch II Semester Regular End Examinations (BR23), April-2026
DISASTER MANAGEMENT (ME & ECE)

Time: 3 hours Max. Marks: 70

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART-A(10X2M=20M)

1	a) Define Disaster Management.	CO1	BL1	2M
	b) Define natural hazard.	CO1	BL1	2M
	c) What is bio-terrorism?	CO2	BL1	2M
	d) What is solid waste management?	CO2	BL1	2M
	e) Define vulnerability.	CO3	BL1	2M
	f) What is Risk?	CO3	BL1	2M
	g) Define infrastructure mitigation.	CO4	BL1	2M
	h) What are treatment plants?	CO4	BL1	2M
	i) Define climate change adaptation.	CO5	BL1	2M
	j) Define environmental health impact.	CO5	BL1	2M

PART-B(5X10M=50M)

2.	a) Discuss Disaster Management Cycle with neat sketch.	CO1	BL2	5M
	b) Write short note on global warming and disaster risk.	CO1	BL2	5M
	OR			
3.	a) Explain tsunami hazards along the Indian coast with case study.	CO1	BL3	10M
4.	a) Explain transport hazards and safety measures.	CO2	BL3	5M
	b) Discuss emerging infectious diseases and their control.	CO2	BL2	5M
	OR			
5.	a) Explain causes of rail and aircraft accidents.	CO2	BL3	10M
6.	a) Explain social vulnerability in disasters.	CO3	BL3	5M
	b) Write short note on climate change risk reduction.	CO3	BL1	5M
	OR			
7.	a) Discuss vulnerability assessment methods.	CO3	BL2	10M
8.	a) Explain role of RS & GIS in disaster management.	CO4	BL2	5M
	b) Explain the role of technology in earthquake mitigation programme.	CO4	BL2	5M
	OR			
9.	a) Discuss role of technology in agriculture drought monitoring	CO4	BL2	10M
10.	a) Discuss impact of disasters on poverty and deprivation.	CO5	BL2	5M
	b) Explain importance of education in disaster risk reduction.	CO5	BL2	5M
	OR			
11.	a) Discuss the role of corporate sector and Red Cross in disaster risk reduction.	CO5	BL2	10M

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Course Code: 23EC6109

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)
III B.Tech II Semester Regular End Examinations (BR23), April-2026
VLSI DESIGN (ECE)

Time: 3 hours | Max. Marks: 70

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	Define transconductance (gm) of a MOS transistor.	BTL2	1	(2M)
b)	List different Design rules.	BTL1	1	(2M)
c)	Define sheet resistance.	BTL2	2	(2M)
d)	Discuss the limitations of scaling	BTL2	2	(2M)
e)	List the regions of operation of MOSFET.	BTL1	3	(2M)
f)	Define body bias effect.	BTL1	3	(2M)
g)	Describe the rationed logic.	BTL2	4	(2M)
h)	Draw the Cross coupled NAND circuit for D flip-flop.	BTL1	4	(2M)
i)	List different FPGA Technologies.	BTL1	5	(2M)
j)	List the advantages of Metal Gate Technologies.	BTL2	5	(2M)

PART–B (5X10 = 50M)

UNIT-I

2.(a)	Derive the Ids–Vds characteristics of MOS transistor in non-saturation regions of operation.	BTL2	1	(5M)
2.(b)	Sketch the circuit diagram, stick diagram and Layout Diagrams of CMOS Inverter.	BTL2	1	(5M)
	(OR)			
3.(a)	Illustrate the nMOS fabrication steps with neat sketch.	BTL3	1	(5M)
3.(b)	Compare MOS and BiCMOS technologies.	BTL2	1	(5M)

UNIT-II

4.(a)	Explain the concept of sheet resistance Rs applied to MOS transistors.	BTL3	2	(5M)
4.(b)	Illustrate the Scaling factors for Device parameters.	BTL3	2	(5M)
	(OR)			
5.(a)	Explain driving large capacitive loads and discuss their issues.	BTL3	2	(5M)
5.(b)	Describe the limits due to subthreshold currents.	BTL4	2	(5M)

UNIT-III

6.(a)	Explain biasing styles with neat diagrams.	BTL3	3	(5M)
6.(b)	Analyse common source amplifier and derive voltage gain.	BTL4	3	(5M)
	(OR)			
7.(a)	Analyze single stage amplifier with diode connected load.	BTL4	3	(5M)
7.(b)	Explain the design of MOS current sources and sinks.	BTL3	3	(5M)
	UNIT-IV			
8.(a)	Design full adder using pass transistor logic.	BTL3	4	(5M)
8.(b)	Explain cross-coupled NAND and NOR flip-flops for D,JK and RS flip-flops.	BTL3	4	(5M)
	(OR)			
9.(a)	Design multiplexer using pass transistor logic.	BTL4	4	(5M)
9.(b)	Explain dynamic CMOS logic and its advantages.	BTL3	4	(5M)
	UNIT-V			
10(a)	Explain FPGA design flow with block diagram.	BTL3	5	(5M)
10(b)	Illustrate the TFET structure and draw its characteristics.	BTL3	5	(5M)
	(OR)			
11(a)	Classify the FPGA families.	BTL3	5	(5M)
11(b)	Compare MOSFET and FinFET.	BTL3	5	(5M)

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Course Code: 23EC6T10

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE:: ODALAREVU
(AUTONOMOUS)

III B. Tech II Semester Regular End Examinations (BR23), April-2026
MICROPROCESSOR & MICROCONTROLLERS (ECE)

Time: 3 hours Max. Marks: 70

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	What is meant by instruction cycle in a microprocessor?	BTL2	1	(2M)
b)	Mention any four important features of 8086 microprocessor.	BTL4	1	(2M)
c)	What is the function of data transfer instructions in 8086?	BTL2	2	(2M)
d)	What is the purpose of the stack segment and stack pointer in 8086?	BTL2	2	(2M)
e)	How many I/O ports are available in 8255?	BTL2	3	(2M)
f)	What is the need of 8259?	BTL1	3	(2M)
g)	What is the role of the DPTR (Data Pointer) register?	BTL2	4	(2M)
h)	What is meant by operand in an instruction?	BTL2	4	(2M)
i)	Why are RISC processors faster than CISC processors?	BTL2	5	(2M)
j)	What is the difference between interrupt and exception?	BTL2	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.(a)	Explain the architectural of the 8086 microprocessor with a neat diagram.	BTL2	1	(10M)
	(OR)			
3.(a)	Explain minimum-mode and maximum-mode operation of 8086 with neat diagrams. Bring out the differences in control signals generated in each mode.	BTL2	1	(10M)
	UNIT-II			
4.(a)	Explain various addressing modes of 8086 with suitable examples.	BTL3	2	(5M)
4.(b)	Write an 8086assembly language program to evaluate Z=X+Y−W for 16-bit signed numbers stored in memory.	BTL4	2	(5M)
	(OR)			
5.(a)	Discuss the structure and functioning of an Interrupt Service Routine (ISR) in the 8086 system.	BTL4	2	(10M)
	UNIT-III			
6.(a)	Explain how switches and LEDs are interfaced with the 8086 microprocessor using 8255.	BTL2	3	(10M)
	(OR)			
7.(a)	Explain the architecture and working of the Intel 8251A.	BTL2	3	(5M)
7.(b)	Explain the need of DMA controller with a block diagram.	BTL3	3	(5M)

UNIT-IV

8.(a)	Explain the register organization of the 8051 microcontroller and their functions.	BTL4	4	(10M)

(OR)

9.(a)	Explain the design of a traffic light control system using the 8051 microcontroller.	BTL2	4	(10M)

UNIT-V

10(a)	Describe the general architecture of ARM processors with a neat block diagram.	BTL4	5	(10M)

(OR)

11(a)	Explain the modes of operation in ARM Cortex-M3, including Thread mode and Handler mode.	BTL2	5	(5M)
11(b)	Explain the functional description of the Nested Vectored Interrupt Controller (NVIC) in Cortex-M3.	BTL2	5	(5M)

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Course Code: 23EC6T11

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)
III B.Tech II Semester Regular End Examinations (BR23), April 2026
DIGITAL SIGNAL PROCESSING(ECE)

Time: 3 hours Max. Marks: 70

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	Sketch the discrete time signal $x[n]=a^n$ *for all n*, for the following conditions. i) $0 < a < 1$ ii) $a < -1$.	BL1	1	(2M)
b)	Derive the condition for stability of a discrete time system.	BL2	1	(2M)
c)	Compute the DFT of the sequence $x[n]=e^{-0.5n}$, $0 \le n \le 3$.	BL1	2	(2M)
d)	Solve $Z\{(1/3)^{n-1}.u(n-1)\}$ using time shifting property.	BL2	2	(2M)
e)	Find the DFT of the sequence, x(n) = {1, 1, 0, 0}with N = 4.	BL1	3	(2M)
f)	Why IIR filters do not have linear phase?	BL1	3	(2M)
g)	How one can design digital filters from analog filters?	BL1	4	(2M)
h)	What are the advantages and disadvantages of bilinear transformation?	BL1	4	(2M)
i)	Write in brief about Auxiliary Register Compare Register.	BL1	5	(2M)
j)	Mention various stages in Pipelining process.	BL1	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.(a)	Check whether the following systems are Linear Time Invariant (i) $y(n) = x(n) + x(n-2)$ (ii) $y(n) = x^2(n) + \frac{1}{x^2(n-1)}$	BL3	1	(5M)
2.(b)	Find the DTFT and plot the spectrum of $x(n)=(1/2)^n u(n)$.	BL2	1	(5M)
	(OR)			
3.(a)	Find the total response to the following linear constant coefficient difference equation $y(n) - \frac{3}{2}y(n-1) + \frac{1}{2}y(n-2) = \left(\frac{1}{2}\right)^n u(n)$ With initial conditions y(-1) = 1 and y(-2) = 1.	BL3	1	(10M)
	UNIT-II			
4.(a)	State and prove any four properties of DFT.	BL2	2	(10M)
	(OR)			
5.(a)	Determine the Z-transform of the signals: (i) $x(n) = nu(n-1)$ (ii) $x(n) = 2^n \cos(3n)u(n)$	BL3	2	(5M)
5.(b)	What is ROC? Write any two properties of ROC in Z-Transforms.	BL2	2	(5M)
	UNIT-III			

6.(a)	Determine the cascade and Parallel realization structures of the LTI system described by the equation $y(n)+2y(n-1)-y(n-2)=x(n)$	BL2	3	(5M)
6.(b)	Distinguish between FIR and IIR filters.	BL2	3	(5M)
	(OR)			
7.(a)	State and explain the Decimation in Time (DIT) Radix-2 FFT Algorithm for $x(n)=\{1,1,1,1,1,1,1,1\}$ necessary flow diagrams.	BL3	3	(10M)
	UNIT-IV			
8.(a)	For the analog transfer function $H_a(s)=\frac{2}{(s+1)(s+3)}$ determine H(z) if (a) T=1s and (b) T=0.5s using impulse invariant method.	BL3	4	(5M)
8.(b)	Explain about the Characteristics of Practical Frequency Selective Filters.	BL2	4	(5M)
	(OR)			
9.(a)	Design a filter with $H_d(e^{j\omega})=\begin{cases} e^{-3j\omega}, -\frac{\pi}{4}\le\omega\le\frac{\pi}{4} \\ 0, \frac{\pi}{4}\le\lvert\omega\rvert\le\pi \end{cases}$ using a Hamming window with N=7.	BL3	4	(10M)
	UNIT-V			
10.(a)	Briefly explain the following for TMS320C5X: i) Flags available in status register ii) Parallel Logic Unit.	BL3	5	(10M)
	(OR)			
11.(a)	What are the on-chip peripherals available on programmable digital signal processor and explain their functions.	BL2	5	(5M)
11.(b)	What is pipelining? Explain.	BL2	5	(5M)

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Course Code: 23EC6D08

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE: ODALAREVU
(AUTONOMOUS)
III B. Tech II Semester Regular End Examinations (BR23), April 2026
MACHINE LEARNING(ECE)

Time: 3 hours Max. Marks: 70

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	Why data is important to Machine Learning model? Justify.	BL1	1	(2M)
b)	Differentiate between traditional programming and Machine Learning.	BL2	1	(2M)
c)	Why is EDA important in Machine Learning?	BL1	2	(2M)
d)	What is meant by missing data? List its types.	BL2	2	(2M)
e)	Define Supervised Learning.	BL1	3	(2M)
f)	Distinguish between classification and regression.	BL2	3	(2M)
g)	List different types of clustering techniques.	BL1	4	(2M)
h)	What is K-Means algorithm?	BL1	4	(2M)
i)	List advantages of visualization in Machine Learning.	BL1	5	(2M)
j)	What is cross-validation?	BL2	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.(a)	Describe the stages involved in the Machine Learning lifecycle with a neat diagram.	BL4	1	(5M)
2.(b)	Explain types of data used in Machine Learning.	BL2	3	(5M)
	(OR)			
3.(a)	Explain the different paradigms of Machine Learning such as supervised, unsupervised, and reinforcement learning with examples.	BL2	2	(10M)
	UNIT-II			
4.(a)	Describe missing data methods.	BL3	2	(5M)
4.(b)	Explain steps in data acquisition and data cleaning.	BL2	2	(5M)
	(OR)			
5.(a)	Discuss Univariate, Bivariate, and Multivariate Analysis.	BL4	2	(10M)
	UNIT-III			
6.(a)	Explain Naïve Bayes classifier with example.	BL3	3	(5M)
6.(b)	Differentiate classification and regression.	BL2	3	(5M)
	(OR)			
7.(a)	Describe Decision Tree algorithm with advantages and limitations.	BL3	3	(10M)

	UNIT-IV			
8.(a)	Explain challenges in Unsupervised Machine Learning.	BL3	4	(5M)
8.(b)	Differentiate agglomerative and divisive clustering.	BL3	4	(5M)
	(OR)			
9.(a)	Explain clustering techniques and their applications.	BL4	4	(10M)
	UNIT-V			
10.(a)	Explain Grid Search and Randomized Search.	BL2	5	(5M)
10.(b)	Explain univariate visualizations.	BL2	5	(5M)
	(OR)			
11.(a)	Explain evaluation metrics for classification.	BL5	5	(10M)

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Course Code: **23EC6D11**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)
III B.Tech II Semester Regular End Examinations (BR23), APRIL-2026
EMBEDDED SYSTEMS(ECE)

Time: 3 hours Max. Marks: 70

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

1.a)	Define Embedded System.	BL1	1	(2M)
b)	What are the quality attributes of embedded systems?	BL3	1	(2M)
c)	What is a serial communication device?	BL1	2	(2M)
d)	What is the difference between timer and counter?	BL2	2	(2M)
e)	What is ISR? Explain it	BL2	3	(2M)
f)	What is the main advantage of DMA?	BL2	3	(2M)
g)	Explain types of scheduling.	BL2	4	(2M)
h)	Define multiprocessing.	BL1	4	(2M)
i)	What is an emulator?	BL2	5	(2M)
j)	Mention any two debugging tools used in embedded systems.	BL4	5	(2M)

PART–B (5X10 = 50M)

UNIT-I

2.(a)	Explain the classification of embedded systems and describe it.	BL2	1	(5M)
2.(b)	Discuss application-specific and domain-specific embedded systems with examples.	BL2	1	(5M)
	(OR)			
3.(a)	Describe the core of an embedded system. Explain the different main processing elements used in embedded system design.	BL2	1	(10M)

UNIT-II

4.(a)	Explain analog and digital I/O types with suitable examples.	BL2	2	(5M)
4.(b)	Describe the parallel device ports and their role in embedded systems.	BL2	2	(5M)
	(OR)			
5.(a)	Explain Serial communication protocols (UART, SPI, I2C).	BL2	2	(5M)
5.(b)	Explain the function and importance of a watchdog timer in embedded systems.	BL2	2	(5M)

	UNIT-III			
6.(a)	Describe the interrupt servicing mechanism in embedded systems.	BL2	3	(5M)
6.(b)	Explain device driver concept	BL2	3	(5M)
	(OR)			
7.(a)	Explain firmware development process	BL2	3	(5M)
7.(b)	Differentiate between C and Embedded C programming languages.	BL4	3	(5M)
	UNIT-IV			
8.(a)	Describe multiprocessing and multitasking in embedded operating systems.	BL2	4	(5M)
8.(b)	Differentiate between process and thread.	BL4	4	(5M)
	(OR)			
9.(a)	Explain the computational models used in embedded system design.	BL2	4	(5M)
9.(b)	Discuss hardware–software partitioning	BL2	4	(5M)
	UNIT-V			
10(a)	Explain the Integrated Development Environment (IDE) used in embedded system development.	BL2	5	(5M)
10(b)	Describe the target hardware debugging process in embedded systems.	BL2	5	(5M)
	(OR)			
11(a)	Explain debugging tools used in embedded systems	BL2	5	(5M)
11(b)	Explain embedded system development life cycle	BL2	5	(5M)

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Course Code: 23CS6T10

BONAMVENKATACHALAMAYYAENGINEERINGCOLLEGE::ODALAREVU
(AUTONOMOUS)
III B.Tech II Semester Regular End Examinations (BR23), April -2026
COMPILER DESIGN (CSE)

Time: 3 hours **Max.Marks: 70**

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	Explain the difference between a compiler and an interpreter.	2	1	(2M)
b)	Identify the purpose of the sentinel character in the two-buffer scheme.	2	1	(2M)
c)	List out various top-down parsing techniques.	2	2	(2M)
d)	List out various error recovery modes in top-down parsing.	1	2	(2M)
e)	Convert the expression a + b * c into Three Address Code.	3	3	(2M)
f)	How the while loop is translated into TAC?	1	3	(2M)
g)	Define flow graph.	1	4	(2M)
h)	What is constant folding?	1	4	(2M)
i)	Explain register assignment.	2	5	(2M)
j)	What are the various object code forms?	1	5	(2M)

PART–B(5X10=50M)

		BTL	CO	Marks
	UNIT-I			
2.(a)	Describe and illustrate the working of the two-buffer input scheme using sentinel characters.	2	1	(5M)
2.(b)	Draw and explain transition diagrams to recognize the following tokens: • Relational operators • unsigned numbers	2	1	(5M)

(OR)

3.(a)	• Consider the following Grammar: $E \rightarrow E + T \mid T$ $T \rightarrow T * F \mid F$ $F \rightarrow (E) \mid id$ Remove left recursion. • Do left factoring in the following grammar: S→iEtS | iEtSeS | a E→b	3	1	(5M)
3.(b)	Explain the role of the parser in a compiler.	2	1	(5M)

UNIT-II

4.(a)	.mar: S ->R L -> * R L ->id R ->L S -> L = R S ->R L -> * R L ->id R ->L Construct LL(1) parsing table for the above grammar. State whether the above mentioned grammar is LL(1) or not and give reasons for either cases.	4	2	(5M)
4.(b)	Explain shift-reduce parsing with an example.	2	2	(5M)

OR

5.(a)	Implement the Recursive Decent Parser for the given grammar. S →cAd A → a | ab	3	2	(5M)
5.(b)	Explain algorithms to find FIRST and FOLLOW and find FIRST and S→ aBbSA | d A→ eS | ε B→ f	2	2	(5M)

UNIT-III

6.(a)	Draw the syntax tree and DAG for the following expression: a+a*(b-c)+(b-c)*d	3	3	(5M)
6.(b)	Differentiate between S-attributed and L-attributed SDDs.	4	3	(5M)

(OR)

7.(a)	Construct an annotated parse tree for the expression 3*5+4n.	4	3	(5M)
7.(b)	Construct the quadruples, triples and indirect triples for the expression: -(a*b)+(c+d)-(a+b+c+d)	4	3	(5M)

UNIT-IV

8.(a)	Explain Peephole Optimization.	2	4	(5M)
8.(b)	What are basic blocks? Write the algorithm for partitioning into Blocks	2	4	(5M)

(OR)

9.	Explain about • the DAG representation of basic blocks • dead-code elimination • the use of algebraic identities. • Copy propagation • Common sub expression elimination	2	4	(10M)

UNIT-V

10.(a)	What is register allocation? Discuss various strategies for register allocation.	2	5	(5M)
10.(b)	Explain a simple code generator.	2	5	(5M)

(OR)

11(a)	Explain Procedure Calls.	2	5	(5M)
11(b)	Explain run-time storage allocation methods with suitable examples.	2	5	(5M)

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BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)
III-B.Tech II-Semester Regular End Examinations (BR23), April-2025
CLOUD COMPUTING (CSE)

Time: 3 hours **Max. Marks: 70**

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	Define Utility Computing.	1	1	(2M)
b)	List the three service models of cloud computing.	3	1	(2M)
c)	Define distributed computing.	2	2	(2M)
d)	What is the purpose of Remote Procedure Call (RPC)?	3	2	(2M)
e)	Why is virtualization considered a key technology in cloud computing?	1	3	(2M)
f)	Name the basic building blocks of containers.	2	3	(2M)
g)	Name any two benefits of federated clouds.	2	4	(2M)
h)	Define cloud security.	2	4	(2M)
i)	What is OpenFaaS?	2	5	(2M)
j)	List any two applications of IoT.	1	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.(a)	Explain the key characteristics of cloud computing and how they benefit users.	3	1	(5M)
2.(b)	Analyze the advantages and limitations of different cloud deployment models.	4	1	(5M)
	(OR)			
3.(a)	Distinguish between IaaS, PaaS, and SaaS with examples.	3	1	(5M)
3.(b)	Give a brief note on Microsoft Azure.	4	1	(5M)
	UNIT-II			
4.(a)	Describe the key elements of distributed computing.	5	2	(5M)
4.(b)	Compare parallel computing and distributed computing with examples.	5	2	(5M)

	(OR)			
5.(a)	Explain the elements of parallel computing and their importance.	5	2	(5M)
5.(b)	Explain the working of Remote Procedure Call (RPC) with a neat sketch.	5	2	(5M)
	UNIT-III			
6.(a)	Explain the characteristics of virtualized(taxonomy) environments with a neat diagram.	2	3	(5M)
6.(b)	Discuss the role of Docker Swarm and Kubernetes.	3	3	(5M)
	(OR)			
7.(a)	Compare virtual machines and containers in cloud environments.	4	3	(5M)
7.(b)	Explain the architecture of VMware virtualization.	2	3	
	UNIT-IV			
8.(a)	Discuss the issues related to cloud interoperability and standardization.	2	4	(5M)
8.(b)	Explain energy efficiency in cloud computing and green cloud techniques.	3	4	(5M)
	(OR)			
9.(a)	Explain the economics of cloud computing in detail.	4	4	(5M)
9.(b)	Explain the importance of fault tolerance in cloud systems.	3	4	(5M)
	UNIT-V			
10.(a)	Explain the architecture of serverless computing.	3	5	(5M)
10.(b)	Evaluate the potential benefits and challenges of quantum cloud computing.	4	5	(5M)
	(OR)			
11.(a)	Discuss the importance of edge and fog computing.	2	5	(5M)
11.(b)	Describe Infrastructure-as-Code tool in detail.	3	5	(5M)

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Course Code: **23CS6T12**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)
III B.Tech II Semester Regular End Examinations (BR23), April - 2026
CRYPTOGRAPHY AND NETWORK SECURITY (CSE)

Time: 3 hours Max. Marks: 70

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	Define Security Goals?	BL1	1	(2M)
b)	Define confidentiality and authentication?	BL1	1	(2M)
c)	What is symmetric key cryptography?	BL2	2	(2M)
d)	List two differences between DES and AES.	BL1	2	(2M)
e)	What is the Chinese Remainder Theorem (CRT)?	BL2	3	(2M)
f)	Define Elgamal .cryptosystem.	BL2	3	(2M)
g)	What is Kerberos?	BL1	4	(2M)
h)	Define message authentication.	BL2	4	(2M)
i)	What is PGP?	BL1	5	(2M)
j)	What is firewall?	BL2	5	(2M)

PART–B (5X10 = 50M)

UNIT-I

2.(a)	Explain the network security model with neat sketch.	BL2	1	(4M)
2.(b)	Explain different types of security services and mechanisms.	BL2	1	(6M)
	(OR)			
3.(a)	Define the Euclidean Algorithm and explain its process and algorithm.	BL2	1	(5M)
3.(b)	Find the multiplicative inverse of 7 in Z_{26}.	BL2	1	(5M)

UNIT-II

4.(a)	Explain the concepts of groups, rings, and fields.	BL3	2	(10M)
	(OR)			
5.(a)	Explain DES algorithm with neat diagram.	BL3	2	(5M)
5.(b)	Explain AES key Expansion Algorithm.	BL2	2	(5M)

UNIT-III

6.(a)	Find the solution to the simultaneous equations by using Chinese Remainder Theorem: $X \equiv 2 \pmod 3$, $X \equiv 3 \pmod 5$, $X \equiv 2 \pmod 7$.	BL3	3	(10M)

(OR)

7.(a)	Apply the RSA algorithm to perform Encryption and Decryption for the following p=7, q=11, e=17 and M=88.	BL3	3	(10M)

UNIT-IV

8.(a)	Briefly explain the requirements of message authentication.	BL2	4	(5M)
8.(b)	Explain the properties of cryptographic hash functions.	BL2	4	(5M)

(OR)

9.(a)	Discuss any four services provided by Digital Signatures.	BL1	4	(5M)
9.(b)	Discuss symmetric key distribution methods.	BL2	4	(5M)

UNIT-V

10.(a)	Explain the working of PGP for secure e-mail communication.	BL3	5	(5M)
10.(b)	Explain SSL/TLS architecture and its functions.	BL3	5	(5M)

(OR)

11.(a)	Discuss the two security protocols of IPSec: AH and ESP.	BL2	5	(6M)
11.(b)	Explain the types of IDS used in network security.	BL2	5	(4M)

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Course Code: 23CS6D05

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)

III B.Tech II Semester Regular End Examinations (BR23), APRIL-2026

SOFTWARE TESTING METHODOLOGIES (CSE)

Time: 3 hours **Max. Marks: 70**

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	Define software testing.	BTL1	1	(2M)
b)	State the meaning of path predicate.	BTL1	1	(2M)
c)	List the applications of data flow testing.	BTL1	2	(2M)
d)	Define data flow testing.	BTL1	2	(2M)
e)	State the meaning of path expression.	BTL1	3	(2M)
f)	What is KV (Karnaugh) charts?	BTL2	3	(2M)
g)	Define state graph with example.	BTL1	4	(2M)
h)	List the steps involved in state testing.	BTL1	4	(2M)
i)	Define relation in graph theory.	BTL1	5	(2M)
j)	What is node reduction algorithm?	BTL2	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.(a)	Describe dichotomies in software testing.	BTL2	1	(5M)
2.(b)	Elucidate Heuristic procedures for sensitizing path.	BTL2	1	(5M)
	(OR)			
3.(a)	Explain the model for software testing.	BTL3	1	(5M)
3.(b)	Examine the advantages and limitations of path testing.	BTL4	1	(5M)
	UNIT-II			
4.(a)	What is transaction flow testing? Explain with example.	BTL3	2	(5M)
4.(b)	Compare data flow testing with control flow testing.	BTL4	2	(5M)
	(OR)			
5.	Demonstrate nice and ugly domains with examples.	BTL3	2	(10M)

UNIT-III

6.	Outline the reduction procedure for path expressions, detailing the essential steps involved and providing an example to illustrate the process.	BTL3	3	(10M)

(OR)

7.(a)	Describe flow anomaly detection techniques.	BTL2	3	(5M)
7.(b)	Discuss decision tables with an example.	BTL3	3	(5M)

UNIT-IV

8.(a)	Explain state testing in detailed manner.	BTL2	4	(5M)
8.(b)	Evaluate importance of testability in software quality assurance.	BTL4	4	(5M)

(OR)

9.	Discuss good and bad state graphs with examples.	BTL3	4	(10M)

UNIT-V

10(a)	Describe adjacency matrix representation with suitable example.	BTL3	5	(5M)
10(b)	Illustrate how testing tools help in automation testing.	BTL2	5	(5M)

(OR)

11.(a)	Demonstrate the relations of graphs with an example.	BTL3	5	(5M)
11.(b)	Analyze advantages of graph matrices in testing.	BTL4	5	(5M)

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Course Code: 23CS6D11

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)
III B.Tech II Semester Regular End Examinations (BR23), April- 2026
BIG DATA ANALYTICS (CSE)

Time: 3 hours **Max. Marks: 70**

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

1		BTL	CO	Marks
a)	What is unstructured data?	2	CO1	2M
b)	Mention one application of Big Data in health care.	2	CO1	2M
c)	Give one example of a document database.	1	CO2	2M
d)	What is sharding in NoSQL?	2	CO2	2M
e)	What is data locality in Hadoop?	2	CO3	2M
f)	Name one Hive file format.	1	CO3	2M
g)	What is a Spark Session?	2	CO4	2M
h)	Name one cluster manager used with Spark.	1	CO4	2M
i)	What is watermarking in Spark streaming?	2	CO5	2M
j)	Define event-time processing.	1	CO5	2M

PART – B (5 × 10 = 50 Marks)

UNIT – I

2.(a)	What is Crowd Sourcing Analytics and how does it benefit businesses?	2	CO1	5M
2.(b)	Illustrate Big Data applications in medicine and healthcare.	4	CO1	5M
	OR			
3.	Explain Bigdata technologies and role of Hadoop in Bigdata.	4	CO1	10M
	UNIT – II			
4.(a)	Describe in detail how to create and interact with tables in Cassandra.	3	CO2	5M
4.(b)	Explain aggregate data models.	2	CO2	5M
	OR			
5.(a)	What are materialized views and how are they used in NoSQL?	2	CO2	5M
5.(b)	Discuss about replication in NoSQL systems.	2	CO2	5M
	UNIT – III			
6.(a)	Describe the Map Reduce process flow and its components.	4	CO3	5M
6.(b)	Discuss the data types and HiveQL commands in Apache Hive.	2	CO3	5M

	OR			
7.	Analyze the role of HDFS and Map Reduce in processing large datasets efficiently.	4	CO3	10M
	UNIT – IV			
8.(a)	How does Spark handle complex data types like JSON?	2	CO4	5M
8.(b)	Explain the concept of broadcast variables and accumulators.	4	CO4	5M
	OR			
9.(a)	Explain how to deploy Spark in cluster mode and describe cluster managers.	2	CO4	5M
9.(b)	Explain Apache spark architecture.	2	CO4	5M
	UNIT – V			
10.	Explain Spark performance tuning techniques and discuss about state full stream processing.	2	CO5	10M
	OR			
11.	Describe handling nulls, dates and timestamps in spark data frames.	3	CO5	10M

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(AUTONOMOUS)

III-B.Tech II-Semester Regular End Examinations (BR23)-April-2026

PRINCIPLES OF COMMUNICATIONS (CSE)

Time: 3 hours **Max. Marks: 70**

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a	What is the modulation index of AM?	BL1	1	(2M)
b.	Define Amplitude Modulation ?	BL1	1	(2M)
c.	What is Vestigial Side Band modulation?	BL1	2	(2M)
d.	Define Hilbert Transform?	BL1	2	(2M)
e.	Define Frequency Modulation?	BL1	3	(2M)
f.	Differentiate FM & PM .	BL2	3	(2M)
g.	What is Delta modulation ?	BL1	4	(2M)
h.	What is the Nyquist Rate?	BL1	4	(2M)
i.	Define a random variable?	BL1	5	(2M)
j.	What is Signal-to-Noise Ratio (SNR)?	BL1	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.a	With neat skecthes, explain the block diagram of a communication system?	BL2	1	(5M)
2.b	State and prove any three properties of Fourier Transform?	BL3	1	(5M)
	(OR)			
3	What is the need for modulation? Derive the expression for AM and mention its merits and demerits?	BL3	1	(10M)
	UNIT-II			
4	Discuss the detection process of DSB-SC and SSB-SC using coherent detector. Analyze the drawbacks of the suggested methodology.	BL3	2	10M)

5.a	Explain the operation of envelope detector?	BL2	2	(5M)
5.b	Explain Single Sideband Modulation (SSB-SC) and derive its equation?	BL3	2	(5M)
	UNIT-III			
6.a	With neat diagram and explain the block diagram of Frequency Modulation with waveforms?	BL2	3	(5M)
6.b	Draw and explain the block diagram of Phase Modulation (PM) with waveforms?	BL2	3	(5M)
	(OR)			
7.a	With neat diagram and Explain the operaton of Foster-Seeley method ?	BL3	3	(5M)
7.b	Explain the operaton of Balanced Slope Detector?	BL3	3	(5M)
	UNIT-IV			
8.a	Mention any five advantages of digital communication system over analog communication.	BL2	4	(5M)
8.b	Explain Pulse Amplitude Modulation with a neat diagram?	BL2	4	(5M)
	(OR)			
9.a	Define signal to quantization noise ratio of Uniform an non uniform quantizer.	BL2	4	(5M)
9.b	With a neat diagram explain the process of delta modulation?	BL2	4	(5M)
	UNIT-V			
10	Explain MAP principle and its properties?	BL2	5	(10M)
	(OR)			
11	Explain and classify Different Types of Noise with examples?	BL2	5	(10M)

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Course Code: 23AD6T05

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE:: ODALAREVU
(AUTONOMOUS)
III B.Tech II Semester Regular End Examinations (BR23), APRIL-2026
MACHINE LEARNING (CSE(AI&DS))

Time: 3 hours **Max. Marks: 70**

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	What is Data Acquisition?	L1	1	(2M)
b)	Explain Model Prediction.	L2	1	(2M)
c)	What is Non-Metric Similarity Functions?	L2	2	(2M)
d)	Explain about multiclass classifications.	L1	2	(2M)
e)	What is Trees for Classification?	L1	3	(2M)
f)	Explain Bayes' Rule and Inference?	L2	3	(2M)
g)	What is Support Vector Machines?	L2	4	(2M)
h)	What is Kernel Trick?	L1	4	(2M)
i)	How Expectation Maximization-BasedClustering is helpful in real time?	L3	5	(2M)
j)	Why we need Matrix Factorization.	L3	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	Discuss the evolution of machine learning from the early days to the present. What are the key milestones?	L3	1	(10M)
	(OR)			
3.(a)	What are the different types of learnings in Machine Learning?	L2	1	(5M)
(b)	Explain ML Learnings by Rote, Learning by Induction, and Reinforcement Learning with real-life applications.	L2	1	(5M)
	UNIT-II			
4.	What is Non-Metric Similarity Function? Explain its importance in machine learning and give examples.	L2	2	(10M)
	(OR)			

5.(a)	Discuss RDNN regression.	L3	2	(5M)
(b)	Discuss KNN regression.	L3	2	(5M)

UNIT-III

6.	Explain about Decision Tree for Classification with an Example.	L3	3	(10M)

(OR)

7.	Explain Naive Baye's Classifier with a Sample Data set.	L4	3	(10M)

UNIT-IV

8.	Compare Linear Regression vs Logistic Regression.	L3	4	(10M)

(OR)

9.	What is Perception? Explain the working of Perception Learning Algorithm.	L3	4	(10M)

UNIT-V

10.a)	Describe the clustering with main steps involved in the Rough K-Means.	L3	5	(5M)
(b)	Explain spectral clustering algorithm.	L3	5	(5M)

(OR)

11.	Explain Fuzzy C-Means Clustering and Divisive Clustering.	L2	5	(10M)

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Course Code: 23AD6T04

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)
III-B.Tech II-Semester Regular End Examinations (BR23), April-2026
BIG DATA ANALYTICS (CSE(AI&DS), AI&ML)

Time: 3 hours **Max. Marks: 70**

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	Define Set in Java. Why does it not allow duplicate elements?	BL1	1	(2M)
b)	What is Autoboxing and Unboxing?	BL1	1	(2M)
c)	What are the main components ofGoogle File System (GFS)	BL1	2	(2M)
d)	What are Hadoop configuration XML files?	BL1	2	(2M)
e)	Define Reducer.	BL1	3	(2M)
f)	What is Driver code in MapReduce	BL2	3	(2M)
g)	What is Apache Spark?	BL1	4	(2M)
h)	What is RDD?	BL1	4	(2M)
i)	List any two features of pig.	BL1	5	(2M)
j)	What are Pig built-in functions?	BL1	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.(a)	Write a program to demonstrate Stack and Queue operations	BL2	1	(10M)
	(OR)			
3.(a)	How do you implement a Generic Type? Explain with example	BL3	1	(5M)
3.(b)	Explain bounded type parameters with example.	BL2	1	(5M)
	UNIT-II			
4.(a)	Explain JobTracker and TaskTracker	BL3	2	(5M)
4.(b)	Explain the steps to configure Hadoop in pseudo-distributed mode.	BL2	2	(5M)
	(OR)			
5.(a)	Explain different Hadoop cluster modes with example	BL2	2	(10M)

UNIT-III

6.	Write a program to calculate average whether data set temperature using MapReduce	BL2	3	(10M)
	(OR)			
7.	Explain MapReduce framework in detail. Discuss its working?	BL2	3	(10M)
	UNIT-IV			
8.	Explain Stream Data Model and Stream Computing architecture in detail.	BL2	4	(10M)
	(OR)			
9.	Explain RDD (Resilient Distributed Dataset) in detail	BI2	4	(10M)
	UNIT-V			
10.(a)	Explain Pig script interfaces.	BL2	5	(5M)
10.(b)	Explain Pig architecture and data types in Pig Latin.	BL3	5	(5M)
	(OR)			
11.(a)	Explain Hive DML operations.	BL2	5	(5M)
11.(b)	Explain querying and analyzing data using HiveQL	BI.2	5	(5M)

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Course Code: 23AD6D05

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)
III B.Tech II Semester Regular End Examinations (BR23), April 2026
CRYPTOGRAPHY AND NETWORK SECURITY
Common for CSE(AI&DS), AI&ML AND CSE(AI&ML)

Time: 3 hours **Max. Marks: 70**

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	What is cryptography?	BL2	1	(2M)
b)	Distinguish between "Passive Attacks" and "Active Attacks.	BL2	1	(2M)
c)	Write representation of an GF(2^n) fields.	BL2	2	(2M)
d)	What is the significance of the Miller-Rabin test in generating primes?	BL2	2	(2M)
e)	Define the Confusion and Diffusion properties in block cipher design.	BL2	3	(2M)
f)	What are the two main requirements for a cryptosystem to be considered Public-Key?	BL2	3	(2M)
g)	List any two specific applications of Cryptographic Hash Functions.	BL2	4	(2M)
h)	What is Message Authentication Code?	BL2	4	(2M)
i)	List out web security considerations.	BL2	5	(2M)
j)	What is a Detached Signature in the context of S/MIME?	BL2	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.(a)	Discuss the "Need for Security" in modern distributed systems and explain the fundamental Principles of Security?	BL4	**1**	(5M)
2.(b)	Explain the various "Security Mechanisms" as defined by the OSI Security Architecture?	BL2	**1**	(5M)
	(OR)			
3.(a)	Elaborate on the "Symmetric Cipher Model" with a neat diagram showing the essential components?	BL2	1	(5M)
3.(b)	Differentiate between Steganography and Cryptography?	BL2	1	(5M)
	UNIT-II			
4.	Define Groups, Rings, Fields?	BL3	2	(10M)

(OR)

5.	Use the Chinese Remainder Theorem (CRT) to find the smallest positive integer *X*that satisfies the congruences: X≡2(mod3), X≡3(mod5), X≡2(mod7).	BL3	2	(10M)

UNIT-III

6.	Describe the internal structure of the Data Encryption Standard (DES) with a detailed diagram of the Feistel function?	BL2	3	(10M)

(OR)

7.a)	Explain about RSA algorithm.	BL3	3	(5M)
7.b)	Explain the principles of public key crypto system.	BL3	3	(5M)

UNIT-IV

8.a)	Describe the internal logic and processing steps of the Secure Hash Algorithm (SHA-512)?	BL3	4	(5M)
8.b)	Explain how a Hash Function can be constructed based on Cipher Block Chaining (CBC)?	BL3	4	(5M)

(OR)

9.	What are Message Authentication Functions and requirements of Message Authentication codes?	BL3	4	(10M)

UNIT-V

10.a)	Describe the TLS Handshake Protocol in detail, highlighting how the client and server establish a secure session?	BL3	5	(5M)
10.b)	Describe Secure Socket Layer?	BL3	5	(5M)

(OR)

11.a)	Describe IP security Overview?	BL3	5	(5M)
11.b)	Discuss the operational steps of Pretty Good Privacy (PGP) for providing E-mail confidentiality and authentication?	BL3	5	(5M)

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Course Code: 23AD6T06

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)
III B.Tech II Semester Regular End Examinations (BR23), April 2026

DATA VISUALIZATION (CSE(AI&DS), AI&ML & CSE(AI&ML))

Time: 3 hours **Max. Marks: 70**

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	Define Data Visualization.	BL1	1	(2M)
b)	What is Information Overload?	BL1	1	(2M)
c)	Define Visualization Reference Model.	BL1	2	(2M)
d)	What is Visual Analytics?	BL1	2	(2M)
e)	Define text visualization.	BL1	3	(2M)
f)	What is Multi-dimensional Visualization	BL1	3	(2M)
g)	What is network visualization?	BL1	4	(2M)
h)	What is Cluster Visualization?	BL4	4	(2M)
i)	What is volumetric data visualization?	BL1	5	(2M)
j)	What is Collaborative Visualization?	BL1	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.a)	Explain the Visualization Process and discuss the role of Visual Perception in design.	BL3	1	(10M)
	(OR)			
3. a)	Discuss the History of Data Visualization.	BL2	1	(5M)
b)	Discuss Gestalt Principles and their importance in visualization design	BL2	1	(5M)
	UNIT-II			
4.a)	Explain Visual Mapping and its importance in creating effective visual representations.	BL3	2	(10M)
	(OR)			
5.(a)	Explain Visual Mapping Techniques with examples	BL5	2	(5M)
(b)	Discuss the Design of Visualization Applications.	BL3	2	(5M)

UNIT-III

6.a)	Explain techniques used for visualization of one-dimensional, two-dimensional and multi-dimensional data	BL3	3	(10 M)

(OR)

7. a)	Classify different Visualization Systems	BL4	3	(5 M)
b)	Explain misleading visualization with examples	BL3	3	(5 M)

UNIT-IV

8. a)	Explain visualization techniques for Groups, Trees and Graphs with examples	BL2	4	(10M)

(OR)

9. a)	Explain Network Visualization	BL3	4	(5M)
b)	Discuss Metaphorical Visualization with suitable examples	BL3	4	(5M)

UNIT-V

10 a)	Explain Map-based Visualization and GIS Systems.	BL4	5	(10M)

(OR)

11(a)	Explain Evaluation Techniques of Visualization systems.	BL5	5	(5M)
11(b)	Discuss Recent Trends in Data Visualization.	BL5	5	(5M)

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Course Code: 23EC6E08

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)
III B.Tech II Semester Regular End Examinations (BR23), April 2026
MICROPROCESSORS AND MICROCONTROLLERS
(CSE (AI&DS), AI&ML & CSE (AI&ML))

Time: 3 hours **Max. Marks: 70**

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	What is the function of Instruction Pointer (IP).	BL1	1	(2M)
b)	Define flag and draw the flag register in 8086.	BL1	1	(2M)
c)	What is the use of DB and DW directives?	BL1	2	(2M)
d)	Compare SUB AX, BX and CMP AX, BX instructions.	BL1	2	(2M)
e)	What is the role of SOC and EOC signals in ADC0808?	BL1	3	(2M)
f)	What are the operating modes of 8255 PPI?	BL1	3	(2M)
g)	List the main features of 8051 microcontroller.	BL1	4	(2M)
h)	How many timers/counters are available in 8051?	BL1	4	(2M)
i)	What are the features of ARM processors?	BL1	5	(2M)
j)	List types of families in ARM.	BL1	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.(a)	Explain Harvard and Von Neumann Architectures with Suitable Examples.	BL2	1	(5M)
2.(b)	Explain the concept of pipelining in 8086 microprocessor.	BL3	1	(5M)
	(OR)			
3.(a)	Describe the historical development of microprocessors.	BL2	1	(5M)
3.(b)	Explain the register organization of 8086.	BL2	1	(5M)
	UNIT-II			
4.(a)	Define addressing mode and explain the different addressing modes presented in 8086 Microprocessor with examples.	BL2	2	(5M)
4.(b)	Draw and discuss the interrupt vector table of 8086 microprocessor.	BL2	2	(5M)

(OR)

5.(a)	Explain the stack structure of 8086 in detail with a sketch.	BL2	2	(5M)
5.(b)	Write an Assemble language program to perform arithmetic operation using 8086 Microprocessors.	BL6	2	(5M)

UNIT-III

6.(a)	With a neat block diagram, explain in detail the internal architecture of 8255.	BL2	3	(7M)
6 (b)	Interfacing of a two 4X4 PROM and two 8X4 RAM with 8086 CPU, draw the memory map and interfacing diagram for it, the RAM address follows the ROM address.	BL3	3	(3M)

(OR)

7.(a)	Draw the 8251 USART architecture and explain the operation of each block in it.	BL2	3	(10M)

UNIT-IV

8.(a)	Draw the pin diagram of 8051 and describe the pins.	BL2	4	(5M)
8.(b)	Write short notes on (i) PSW (ii) SCON (iii) PCON (iv) TMOD.	BL2	4	(5M)

(OR)

9.(a)	Draw the 8051 Microcontroller architecture and explain its operation in detail.	BL2	4	(5M)
9.(b)	Explain the different types of timers in 8051.	BL2	4	(5M)

UNIT-V

10.(a)	Draw and explain ARM7 architecture in detail.	BL2	5	(10M)

(OR)

11.(a)	Compare CSIC and RISC architectures with suitable examples.	BL2	5	(5M)
11.(b)	Discuss the Thumb instruction set of ARM controller.	BL2	5	(5M)

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Course Code: 23ML6D02

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
III B.Tech II Semester Regular End Examinations (BR23) April-2026
CLOUD COMPUTING (CSE(AI&DS) and AI&ML)

Time: 3 hours **Max. Marks: 70**

Question Paper consists of Part-A and Part-B
Answer ALL the question in Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or

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PART–A (10X2 = 20M)

1.a)	What is Cloud Computing and write any two merit and demerits?	CO1	BL1	(2M)
b)	State the features of AWS.	CO1	BL2	(2M)
c)	What are the parallel computing architectures elements?	CO2	BL1	(2M)
d)	What are the features of Google App Engine?	CO2	BL1	(2M)
e)	What is the Virtual Machine?	CO3	BL1	(2M)
f)	State the role of containers in cloud platforms.	CO3	BL2	(2M)
g)	What are the levels of virtualization?	CO4	BL1	(2M)
h)	What is Microsoft Azure?	CO4	BL1	(2M)
i)	How to found the data security risk. Explain	CO5	BL1	(2M)
j)	Define Authentication.	CO5	BL2	(2M)

PART–B (5X10 = 50M)

UNIT-I

2.	What is cloud computing? Explain characteristics, advantages & benefits.	CO1	BL2	(10M)

(OR)

3. (a)	Explain basic cluster architecture with neat diagram.	CO1	BL2	(5M)
3.(b)	Discuss about Cloud Computing Services Deployments(private, public and hybrid)	CO1	BL2	(5M)

UNIT-II

4.	Explain and briefly classify cloud computing services.	CO2	BL2	(10M)

(OR)

5.	Describe IaaS, PaaS, and SaaS with examples.	CO2	BL3	(10M)

UNIT-III

6.	What is a virtual machine? Explain virtualization of I/O devices.	CO3	BL2	(10M)

(OR)

7. (a)	Discuss hypervisor and Xen architecture.	CO3	BL2	(5M)
7.(b)	Explain CPU virtualization with a neat diagram	CO3	BL2	(5M)

UNIT-IV

8. (a)	Describe Amazon EC2 and its features with suitable example.	CO4	BL3	(5M)

8.(b)	Draw the cloud security architecture.	CO4	BL2	(5M)
	(OR)			
9.	Analyze public cloud and infrastructure services with examples.	CO4	BL3	(10M)
	UNIT-V			
10. a)	Explain identity and security in cloud computing.	CO5	BL2	(5M)
10.b)	What are the IoT applications? Explain briefly.	CO5	BL2	(5M)
	(OR)			
11.	Discuss data security challenges in cloud computing with examples.	CO5	BL3	(10M)

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Course Code: 23AM6T05

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)
III B.Tech II Semester Regular End Examinations (BR23), April-2026
REINFORCEMENT LEARNING (AI&ML)

Time: 3 hours Max. Marks: 70

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	Explain the scope of Reinforcement Learning in modern applications.	BL2	1	(2M)
b)	Write the advantages of Reinforcement Learning.	BL2	1	(2M)
c)	Define the n-armed bandit problem.	BL2	2	(2M)
d)	Write the sample-average formula for estimating action values.	BL2	2	(2M)
e)	Define the agent–environment interface in reinforcement learning.	BL2	3	(2M)
f)	What is a Markov Decision Process (MDP)?	BL1	3	(2M)
g)	Define Monte Carlo methods in reinforcement learning.	BL2	4	(2M)
h)	Define on-policy learning.	BL2	4	(2M)
i)	What is job-shop scheduling?	BL2	5	(2M)
j)	What is the purpose of elevator dispatching systems?	BL1	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	Explain the Tic-tac-toe Learning problem with a neat diagram.	BL2	1	(10M)
	(OR)			
3.	Explain the learning process of Reinforcement Learning with examples.	BL3	1	(10M)
	UNIT-II			
4. a)	Describe the action-value methods used for solving bandit problems.	BL3	2	(5 M)
b)	Explain the Upper Confidence Bound (UCB) action selection strategy.	BL2	2	(5 M)
	(OR)			
5. a)	Explain the gradient bandit algorithm with softmax action selection.	BL2	2	(5 M)
b)	Discuss associative search (contextual bandits) with an example.	BL3	2	(5 M)

UNIT-III

6. a)	Define returns and derive the discounted return formula for reinforcement learning problems.	BL3	3	(5 M)
b)	Describe the role of goals and rewards in reinforcement learning	BL2	3	(5 M)

(OR)

7. a)	Explain value functions and their significance in decision making.	BL2	3	(5 M)
b)	Discuss optimal value functions and their relationship with optimal policies	BL2	3	(5 M)

UNIT-IV

8.	Describe Monte Carlo control without exploring starts and explain how ε-greedy policies ensure exploration.	BL2	4	(10M)

(OR)

9.a)	Describe the method for Monte Carlo estimation of action values.	BL2	4	(5M)
b)	Explain the difference between on-policy and off-policy Monte Carlo methods.	BL2	4	(5M)

UNIT-V

10. a)	Describe the design and learning approach used in Samuel's Checkers Player.	BL3	5	(5 M)
b)	Explain the architecture and learning process of TD-Gammon and discuss its impact on reinforcement learning research.	BL2	5	(5 M)

(OR)

11. a)	Explain dynamic channel allocation using reinforcement learning techniques.	BL2	5	(5 M)
b)	Explain the concept of dynamic channel allocation and how reinforcement learning helps optimize wireless communication networks.	BL2	5	(5 M)

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Course Code: 23AM6T03

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)
III B.Tech II Semester Regular End Examinations (BR23), April 2026
DEEP LEARNING (CSE(AI&ML))

Time: 3 hours Max. Marks: 70

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	What is a computational unit in neural networks?	BL1	1	(2M)
b)	State the Convergence Theorem of Perceptron.	BL1	1	(2M)
c)	Define regularization in neural networks.	BL1	2	(2M)
d)	Mention difficulties in training deep neural networks.	BL1	2	(2M)
e)	What is Adagrad optimizer?	BL1	3	(2M)
f)	Briefly describe the how dropout reduces overfitting?	BL1	3	(2M)
g)	What is Long Short-Term Memory (LSTM)?	BL1	4	(2M)
h)	What is Recurrent neural network?	BL4	4	(2M)
i)	Mention applications of deep learning in Vision.	BL1	5	(2M)
j)	List applications of deep learning in Speech processing.	BL1	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	Illustrate the Perceptron Learning algorithm with neat Diagram?	BL3	1	(10M)
	(OR)			
3.a)	Discuss the concept of linear separability and its importance in Perceptron.	BL2	1	(5M)
b)	Explain the structure and functioning of a Biological neuron. Compare it with an artificial neural network?	BL2	1	(5M)
	UNIT-II			
4.	Discuss Empirical Risk Minimization and different regularization techniques used in deep learning.	BL3	2	(10M)
	(OR)			
5.	How are Weights and Biases Updated During Back propagation algorithm with mathematical Derivation using MLP?	BL5	2	(10M)
	UNIT-III			
6.	Describe first order optimization techniques such as adam , adagrad, adadelta and rmsprop.	BL3	3	(10 M)

7. a)	How does Gradient Descent escape Saddle point problem in neural network?	BL4	3	(5 M)
b)	Discuss second-order optimization methods used in neural networks.	BL3	3	(5 M)

UNIT-IV

8.	Explain the architecture of Recurrent Neural Networks (RNN). Describe Backpropagation Through Time (BPTT) with equations.	BL2	4	(10M)

(OR)

9.	Explain Restricted Boltzmann Machines (RBMs). Describe Gibbs Sampling and gradient computation in RBMs.	BL3	4	(10M)

UNIT-V

10.	Describe the Transformer architecture. Explain self-attention mechanism with equations.	BL4	5	(10M)

(OR)

11.	Write detailed notes on recent trends in Deep Learning and their real-world applications.	BL5	5	(10M)

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Course Code: 23AM6T04

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)
III B.Tech II Semester Regular End Examinations (BR23), April -2026
NATURAL LANGUAGE PROCESSING

Time: 3 hours **Max. Marks: 70**

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	Define Minimum Edit Distance.	BL1	1	(2M)
b)	What is tokenization in NLP.	BL1	1	(2M)
c)	What is smoothing in N-gram models.	BL1	2	(2M)
d)	What is a Hidden Markov Model (HMM).	BL1	2	(2M)
e)	What is syntactic parsing.	BL1	3	(2M)
f)	What is ambiguity in syntax.	BL1	3	(2M)
g)	What are thematic roles.	BL1	4	(2M)
h)	What is a thesaurus in NLP.	BL4	4	(2M)
i)	What is discourse segmentation.	BL1	5	(2M)
j)	What is a lemmatizer.	BL1	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2. a)	Explain English morphology with suitable examples.	BL2	1	(5M)
b)	Explain minimum edit distance algorithm.	BL3	1	(5M)
	(OR)			
3. a)	Analyze the process of tokenization and its issues.	BL4	1	(5M)
b)	Evaluate different techniques for spelling error detection and correction.	BL45	1	(5M)
	UNIT-II			
4.(a)	Explain the working of Hidden Markov Models.	BL2	2	(5M)
4.(b)	Apply Maximum Entropy models for tagging problems.	BL3	2	(5M)
	(OR)			
5. a)	Analyze the issues involved in Part-of-Speech tagging.	BL4	2	(5M)
b)	Evaluate different tagging approaches (rule-based, stochastic, transformation-based).	BL5	2	(5M)
	UNIT-III			

b)	Apply CYK algorithm for parsing a sentence.	BL3	3	(5 M)
	(OR)			
7. a)	Analyze probabilistic CFG and its advantages.	BL4	3	(5 M)
b)	Evaluate the role of feature structures and unification.	BL5	3	(5 M)
	UNIT-IV			
8. a)	Analyze different types of word sense relations.	BL4	4	(5M)
b)	Apply supervised methods for Word Sense Disambiguation.	BL3	4	(5M)
	(OR)			
9. a)	Analyze thematic roles and selectional restrictions.	BL4	4	(5M)
b)	Evaluate different approaches for measuring word similarity.	BL5	4	(5M)
	UNIT-V			
10. a)	Explain the working of Porter Stemmer	BL2	5	(5M)
b)	Analyze the role of lexical resources like WordNet and FrameNet.	BL4	5	(5M)
	(OR)			
11(a)	Explain anaphora and centring hobbs algorithm.	BL3	5	(5M)
11(b)	Evaluate the importance of corpora such as Brown Corpus and BNC.	BL5	5	(5M)

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Course Code: 23AD6D07

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)
III-B.Tech II-Semester Regular End Examinations (BR23), April-2026
NOSQL DATABASES (CSE(AI&ML)

Time: 3 hours **Max. Marks: 70**

Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	Differentiate between key-value and document databases.	BL2	1	(2M)
b)	State the meaning of cluster in databases.	BL1	1	(2M)
c)	Define key-value store.	BL1	2	(2M)
d)	What is sharding?	BL1	2	(2M)
e)	List the feature of MongoDB.	BL1	3	(2M)
f)	Define scaling in databases.	BL1	3	(2M)
g)	List characteristics of Apache Cassandra.	BL1	4	(2M)
h)	Define expiring usage in databases.	BL1	4	(2M)
i)	What is shopping cart data storage?	BL2	5	(2M)
j)	List characteristics of graph databases.	BL1	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.(a)	Explain NoSQL databases and their importance in modern applications.	BL2	1	(5M)
2.(b)	Analyze reasons for emergence of NoSQL systems.	BL4	1	(5M)
	(OR)			
3.(a)	What is impedance mismatch in databases? Explain.	BL2	1	(5M)
3.(b)	Discuss four types of NoSQL databases with examples.	BL3	1	(5M)
	UNIT-II			
4.(a)	Describe column-family stores and their advantages?	BL2	2	(5M)
4.(b)	Analyze challenges of NoSQL approach.	BL2	2	(5M)
	(OR)			
5.	Explain different distribution models in NoSQL databases?	BL2	2	(10M)

UNIT-III

6.(a)	What is a document database? Explain its features.	BL2	3	(5M)
6.(b)	Compare Key-Value stores vs Document databases?	BL4	3	(5M)

(OR)

7.	Examine the NoSQL applications in real-world systems.	BL4	3	(10M)

UNIT-IV

8.	Demonstrate the architecture of HBase in detail with diagram?	BL3	4	(10M)

(OR)

9.(a)	Explain column-oriented NoSQL databases with suitable examples.	BL3	4	(5M)
9.(b)	Discuss various applications of column-oriented database	BL2	4	(5M)

UNIT-V

10.	Explain in detail Key-Value databases and their features.	BL2	5	(10M)

(OR)

11.	Illustrate the architecture and use cases of Neo4j.	BL3	5	(10M)

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BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
III B.Tech II Semester Supplementary Examinations (BR20), April-2026
GEO MECHANICS II (CE)

Time: 3 hours Max. Marks: 70

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*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

UNIT-I

1.a) Discuss the importance of soil exploration in foundation engineering with examples. (7M)

1.b) Explain the soil investigation report along with bore log. (7M)

(OR)

1.c) Explain the following terms used in soil exploration: i. Area ratio ii. Recovery ratio iii. Disturbed sample iv. Undisturbed sample. (7M)

1.d) Describe cone penetration tests. How these tests differ from Standard penetration test. (7M)

UNIT-II

2.a) Compute the factor of safety of an infinite slope in a cohesionless soil for a steady state seepage condition, when the flow is parallel to the slope. (7M)

2.b) Explain about types of retaining walls. (7M)

(OR)

2.c) A vertical cut was made in a plastic clay having unit weight of the soil is 19.3kN/m^3. The cut was failed at a depth of excavation 4.5 m. Determine the cohesive strength of clay. (7M)

2.d) Explain in detail the main design considerations for retaining walls and check for stability. (7M)

UNIT-III

3.a) Differentiate between (7M)

i. Shallow foundation and deep foundation,

ii. Gross and net bearing capacity,

iii. Safe bearing capacity and soil pressure.

3.b) A strip footing 1.2m wide is located at a depth of 1m below the ground surface. The properties of the soil are γ=18kN/m^3, c=30kN/m^2 and ϕ=20^0. Determine the safe bearing capacity using a factor of safety of 3. The Terzaghi's bearing capacity factors are N_c=11.8, N_q=3.9 and N_γ =1.7. (7M)

(OR)

3.c) Explain the plate load test to determine the bearing capacity of soil. (7M)

3.d) Differentiate between total settlement and differential settlement. What are the harmful effects of differential settlements on structures? What are the possible remedial measures? (7M)

UNIT-IV

4.a) A timber pile was driven by a drop hammer weighing 30 kN with a free fall of 1.2 m. The average penetration of the last few blows was 5 mm. what is the capacity of the pile according to Engineering News formula? (7M)

4.b) A single load test pile of 0.25 m × 0.25 m square cross - section is driven through a stratum up to a depth of 10 m. It is observed that the undrained cohesion strength is varying from 12.4 kN/m^2 at its surface to 65.3 kN/m^2 at the depth of 10 m. Determine the safe load the pile can carry if the factor of safety is 2.5. (7M)

(OR)

4.c) Explain in detail the pile load testing with a neat sketch. (7M)

4.d) A pile group of 9 piles 40cm diameter, 120cm centre to centre both ways (symmetrically placed) is driven to a depth of 12m through clay of unconfined compressive strength of 100 kN/m^2 and density of 20 kN/m^3. Assuming adhesion factor of 0.5, calculate the load that the group can carry with a factor of safety of 3.0. (7M)

UNIT-V

5.a) Explain with neat sketch different (various) components of wells and their functions. (7M)

5.b) Explain general design criteria for a well foundation. (7M)

(OR)

5.c) Discuss the construction aspects of well foundation. (7M)

5.d) Explain the measures for rectification of 'tilts and shifts'.

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BR20/BR18 04/05/[illegible]

Course Code: 20CE6D06

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)

III -B. Tech II-Semester Supplementary Examinations (BR20), APRIL-2026
Railways, Airports, Docks & Harbours (CE)

Time: 3 hours **Max. Marks: 70**

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*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

UNIT-I

1.a)	Explain the advantages of railways over the other modes of transport.	(7M)
1.b)	Discuss the functions and requirements of various elements of railway permanent way.	(7M)
	(OR)	
1.c)	Derive an expression for the relationship between super elevation, gauge and curve in a railway track.	(7M)
1.d)	What should be the actual ruling gradient if the ruling gradient is 1 in 200 on a B.G track and a curve of 3 degree is superimposed on the above track section of B.G.	(7M)

UNIT-II

2.a)	Draw a neat diagram and explain the signals used at various locations along the standard Prescribed for such location.	(14M)
	(OR)	
2.c)	Distinguish between Diamond crossing and Scissors crossing.	(7M)
2.d)	Draw a neat Sketch of Points and crossings. Describe its components in detail.	(7M)

UNIT-III

3.a)	Length of a runway at mean sea level, standard temperature and zero gradients is 1600 m. The site has an elevation of 320 m, with a reference temperature 33.6 degree centigrade. The runway has to be constructed with an effective gradient of 0.25%. Determine the actual length of runway at the site.	(7M)
3.b)	Enlist and explain aircraft characteristics of an airport.	(7M)
	(OR)	
3.c)	Determine the turning radius of taxiway for a subsonic aircraft of the following characteristics. The coefficient of friction is 0.13 and taxiway width is 22.5 M. a) Wheel base = 15.85 M b) Wheel tread = 6.05 M c) Turning speed = 40 Kmph	(7M)
3.d)	Explain the procedure for orienting runway using wind rose diagram of type I.	(7M)

UNIT-IV

4.a)	Enlist and explain the various design factors to be considered for a runway design.	(7M)
4.b)	Why is Airport Drainage Important? Explain in detail.	(7M)
	(OR)	
4.c)	List and explain design methods for Rigid pavements.	(7M)
4.d)	How does the Pavement Condition Index (PCI) method work, and what are its strengths and limitations in airfield pavement evaluation?	(7M)

UNIT-V

5.a)	Distinguish between Dry & wet docks.	(4M)
5.b)	Explain the components of a harbour. Give neat sketches of the layouts of an artificial harbour and road shed.	(10M)
	(OR)	
5.c)	List and explain Classification of ports.	(7M)
5.d)	Write a detailed note on break water. Explain all essential Aspects.	(7M)

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BR20/BRV0 06/05/2026

Course Code: 20CE6E02

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
III- B. Tech II-Semester Supplementary Examinations (BR20), April - 2026
GREEN BUILDINGS (CE)

Time: 3 hours **Max. Marks: 70**

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*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

UNIT-I

1.a) Discuss briefly on the benefits of 'Green Building'. (14M)

(OR)

1.c) Differentiate between renewable and rapidly renewable construction material? Discuss briefly on any two renewable construction materials. (7M)

1.d) What are key Requisites for constructing a Green Building? (7M)

UNIT-II

2.a) What is Leadership in Energy and Environmental Design (LEED)? What are the benefits of LEED certification? (14M)

(OR)

2.c) Discuss on the typical energy saving approaches in buildings. (7M)

2.d) Discuss on the 'Rain Water Harvesting'. (7M)

UNIT-III

3.a) What is the importance of reducing energy demand? Discuss on the use of onsite sources. (14M)

(OR)

3.c) Discuss on the Ecofriendly captive power generation for factory. (14M)

UNIT-IV

4.a) Discuss briefly on the 'Occupant Comfort'. (7M)

4.b) Determine the energy efficient lighting design principles. (7M)

(OR)

4.c) What is passive cooling? What are the passive cooling techniques? (7M)

4.d) Discuss on the Interior lighting system. (7M)

UNIT-V

5.a) Discuss on the reduction of waste during construction. (7M)

5.b) What is the importance of material recycling and reuse in construction? (7M)

(OR)

5.c) Determine the various reasons for poor IAQ. (7M)

5.d) What is a rapid renewable material? What is the importance of local materials use in construction sector? (7M)

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BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
III-B.Tech II Semester Supplementary Examinations (BR20), April - 2026
POWER ELECTRONIC CONTROLLERS AND DRIVES (EEE)

Time: 3 hours Max. Marks: 70

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*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

UNIT-I

1.a) Discuss different types of loads and their speed-torque characteristics. (7M)

1.b) With neat diagram and relevant waveforms, discuss plugging and regenerative braking employed for dc motors. (7M)

(OR)

1.c) What are various components of load torque? On what factors these components depend? Explain in detail. (7M)

1.d) With neat diagram and relevant waveforms, discuss counter current and dynamic braking operations employed for dc motors. (7M)

UNIT-II

2.a) Compare between single-phase drives and three-phase drives. (4M)

2.b) With a neat diagram and necessary waveforms, discuss the operation of a single-phase full converter based separately excited DC motor drive. (10M)

(OR)

2.c) Explain the operation and characteristics of a single phase half controlled converter fed separately excited dc motor drive. (7M)

2.d) Explain four quadrant operation of a DC Motor drive. (7M)

UNIT-III

3.a) Explain the operation of two quadrant chopper feeding to a separately excited DC motor and also draw the current and voltage wave forms for continuous current operation. (7M)

3.b) Draw the block diagram and explain the operation of closed loop speed control scheme of DC Motor for speeds below the base speed. (7M)

(OR)

3.c) Explain the principle of speed control of a DC Motor and show how it can be achieved by a chopper. (7M)

3.d) Explain the operation of four quadrant chopper fed to the D.C series motor and also draw the current and voltage wave forms for continuous current operation. (7M)

UNIT-IV

4.a) Discuss the relative merits and demerits of stator voltage control employed for Induction Motor drives. (7M)

4.b) A 3.2 kW, 415V, 50Hz, 4 pole, 1440 rpm, delta connected squirrel-cage Induction Motor has following parameters referred to the stator: Rs = 2Ω, $R_r^{'}$ = 5Ω, $X_s = X_r^{'}$ = 5Ω and Xm = 75Ω. Motor speed is controlled by stator voltage control. When driving a fan load it runs at rated speed at rated voltage. Calculate motor terminal voltage, current and torque at 1200 rpm. (7M)

(OR)

4.c) Explain why in an Induction Motor V/f ratio is maintained constant when the motor is operated below the base speed. (7M)

4.d) Briefly discuss the operation of self-controlled synchronous motors by VSI. (7M)

UNIT-V

5.a) Draw the circuit diagram and explain the operation of rotor- resistance control of Induction motor. Mention the advantages and disadvantages of the above method of control. (7M)

5.b) A 3-Ø, 400V, 6-pole, 50Hz, delta-connected, slip-ring induction motor has rotor resistance of 0.2 ohms and leakage reactance of 0.9 ohms per phase referred to stator. When driving a fan load it runs at full load with 5% slip. What resistance must be inserted in the rotor circuit to obtain a speed of 850 rpm. Neglect stator impedance and magnetizing branch. Stator to rotor turns ratio is 2. (7M)

(OR)

5.c) What is slip power recovery? What are its advantages? Discuss the operation of static Kramer drive. (7M)

5.d) Explain Static Scherbius drive control for speed control of induction motor. Draw speed -torque characteristics. (7M)

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BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE: ODALAREVU
(AUTONOMOUS)
III-B. Tech II-Semester Supplementary Examinations (BR20), APRIL - 2026 29.04.2026
POWER SYSTEM ANALYSIS (EEE)

Time: 3 hours **Max. Marks: 70**

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*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

UNIT-I

1.a) Discuss the various types of buses and their significance in details? (7M)

1.b) Derive the static load flow equations of a power system. (7M)

(OR)

1.c) The following data are given for a three bus power system: (14M)
Bus 1 slack bus V specified = $1.05\angle 0_0$
Bus 2 PV bus V specified = 1.02 p.u, P_G = 3 p.u
Bus 3 PQ bus P_L = 4 p.u, Q_L = 2 p.u
Line reactance in p.u are given below:

Bus code	Impedance
1-2	j0.5
2-3	j0.5
3-1	j0.5

Carry out one iteration of load flow solution using Gauss-Seidal method. Take Q limits of generator 2 as $0 \leq Q \leq 4$.

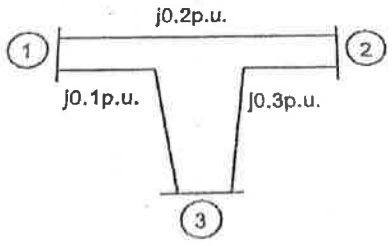
UNIT-II

2.a) Explain the Building Algorithm for Formatting Z bus? (6M)

2.b) Derive the expression for adding a link with mutual inductance between two buses of a system while forming z bus (8M)

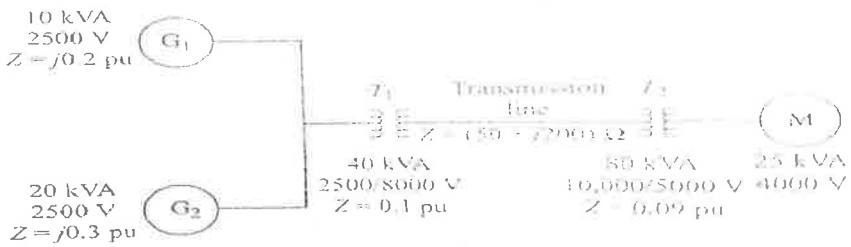
(OR)

2.c) For the system shown in Fig, form the bus impedance matrix (14M)



using building algorithm

3.a) Draw an impedance diagram for the system shown in Fig., expressing all values as per unit values. (14M)



(OR)

3.b) Explain the three phase short circuit currents on unloaded synchronous generator with neat diagrams (7M)

3.c) A three phase, 25 MVA, 11 kV alternator has internal reactance of 6 %. Find the external reactance per phase to be connected in series with the alternator so that steady state short circuit current does not exceed six times the full load current. (7M)

UNIT-IV

4.a) Derive an expression for power in a 3-phase circuit in terms of symmetrical components. (7M)

4.b) Obtain the expression for fault current of LLL fault occur at terminals of unloaded alternator and draw its equivalent circuit (7M)

(OR)

4.c) Derive an expression for the fault current for a double line fault as an unloaded generator and draw its equivalent diagram. (7M)

4.d) A generator of negligible resistance having 1.0 p.u voltage behind transient reactance is subjected to different types of faults. The p.u values of the magnitudes of the fault currents are 3 phase fault-3.33 p.u , line to line fault-2.23 p.u and line to ground fault-3.01 p.u. Find the percentage values of sequence reactance's. (7M)

UNIT-V

5.a) Derive swing equation for a single machine connected to infinite bus system. State the assumptions if any. (9M)

5.b) Discuss the methods by which the transient stability can be improved. (5M)

(OR)

5.c) Derive an expression for the critical clearing angle for a power system consisting of a single machine supplying to an infinite bus, for a sudden load increment. (7M)

5.d) Find the steady state power limit of a system consisting of a generator with a synchronous reactance of 0.4 p.u connected to an infinite bus through a series reactance of 1.0 p.u. The terminal voltage is held at 1.0 p.u and the infinite bus voltage is 1.0 p.u. (7M)

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Course Code: 20EC6T13

BONAMVENKATACHALAMAYYAENGINEERINGCOLLEGE::ODALAREVU
(AUTONOMOUS)
III-B.Tech. II-Semester Supplementary Examinations (BR20), April-2026
MICROPROCESSORS & MICRO CONTROLLERS (EEE)

Time: 3 hours **Max.Marks:70**

Paper consists of five questions, each question has internal choice, and either of them can be answered
All Questions carry Equal Marks

UNIT-I

1.a) Explain briefly about general bus operation of 8086 with neat diagrams. (7M)
b) What do you mean by pipelined architecture? How is it implemented in 8086 processor? (7M)

(OR)

1.c) Explain the physical memory organization in an 8086 system. (7M)
d) Explain about register organization of 8086. (7M)

UNIT-II

2.a) Write an 8086 Assembly language program for addition of two numbers. (7M)
b) Explain different Branch and LOOP instructions of 8086 with suitable examples. (7M)

(OR)

2.c) What do you mean by a Macro? How do you pass parameters to macro? (7M)
d) Draw the timing diagram of minimum mode write operation and explain in detail. (7M)

UNIT-III

3.a) Explain the control word format of 8255 in I/O and BSR mode. (7M)
b) Interface the stepper motor to 8086 using 8255. (7M)

(OR)

3.c) Draw a schematic hardware circuit for interfacing analog to digital conversion with 8086 using output ports. (7M)
d) Explain the architecture of 8257 with neat sketch. (7M)

UNIT-IV

4.a) Explain any seven instructions of 8051 with two examples of each. (7M)
b) What is an interrupt? What are various interrupts supported by 8051 microcontrollers? Specify the priority of these interrupts. (7M)

(OR)

4.c) Explain about timers and serial communication modes. (7M)
d) Write short notes on port structures of 8051. (7M)

UNIT-V

5.a) Explain parallel and serial input and output organization in PIC microcontroller. (7M)
b) List and discuss the main instructions of the PIC16F877. (7M)

(OR)

5.c) Explain interrupt mechanism in PIC16F877. (7M)
d) Draw and explain the architecture of PIC micro controller. (7M)

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Course Code: 20EE6E02

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
III- B. Tech II-Semester Supplementary Examinations (BR20), April - 2026
ARTIFICAL NEUTRAL NETWORKS AND FUZZY LOGIC (EEE)

Time: 3 hours **Max. Marks: 70**

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*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

UNIT-I

1.a)	What is meant by artificial intelligence? What is the need of it and discuss that how human brain plays an important role in Artificial Intelligence?	(7M)
1.b)	What is meant by learning process in AI? Describe various learning methods in Artificial Intelligence.	(7M)

(OR)

1.c)	What is meant by knowledge? How knowledge can be represented in AI? Discuss various types of knowledge.	(7M)
1.d)	How you can define AI technique? Explain various types of AI techniques.	(7M)

UNIT-II

2.a)	What is meant by Activation functions in neural networks? Discuss about sigmoid activation function.	(7M)
2.b)	Compare biological neuron with artificial neuron and discuss how they are differing?	(7M)

(OR)

2.c)	Explain the Perceptron learning algorithm and What is the constraint of a simple perceptron? Why it may fail with a real-world data set?	(7M)
2.d)	Explain the McCulloch–Pitts model of neuron. Implement Boolean OR gate using McCulloch–Pitts neuron model.	(7M)

UNIT-III

3.a)	Explain various steps involved in a Hopfield algorithm.	(7M)
3.b)	What are the stages involved in training a neural net using Back propagation algorithm. Explain.	(7M)

(OR)

3.c)	Explain the working of a Hopfield network with a neat sketch of its architecture.	(7M)
3.d)	Contrast and compare any two recurrent network configuration with a feed forward network.	(7M)

UNIT-IV

4.a)	Discuss any four properties and relations on crisp relation.	(7M)
4.b)	Explain different membership functions of fuzzy sets.	(7M)

(OR)

4.c)	Let X={1, 2, 3, ...10}. Determine the cardinalities and relative cardinalities of the following fuzzy sets. i) A= {(2, 0.4), (3, 0.6), (4, 0.8), (5, 1.0), (6, 0.8), (7, 0.6), (8, 0.4)} ii) B = {(2, 0.4), (4, 0.8), (5, 1.0), (7, 0.6)}	(7M)

4.d) Explain the terms
i. Fuzzy set
ii. Power set
iii. Union of two sets.
iv. Complement of two sets.
v. Difference of two sets (7M)

UNIT-V

5.a) List the various defuzzification techniques. Explain each of them in detail. (7M)

5.b) Discuss fuzzy set methods to assign a membership value. (7M)

(OR)

5.c) Write the different deterministic form of classical decision-making theories and explain. (7M)

5.d) What is meant by fuzzification? How it can be differ from defuzzification? (7M)

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BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
III -B.Tech II-Semester Supplementary Examinations (BR20), April-2026
DYNAMICS OF MACHINERY (ME)

Time: 3 hours | Max. Marks: 70

*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

UNIT-I

1.a) A square-threaded screw has a mean diameter of 50 mm and a pitch of 10 mm. The coefficient of friction is 0.15. Calculate the torque required to raise a load of 5000 N. (7M)

1.b) A single-plate clutch has a mean radius of 120 mm and effective coefficient of friction 0.25. Axial load applied = 3000 N. Calculate the torque transmitted. (7M)

(OR)

1.c) Explain the working of a rope brake dynamometer with a neat sketch. Derive the formula for power. (7M)

1.d) Explain the difference between uniform pressure and uniform wear in pivot bearings. Derive the expression for torque in each case. (7M)

UNIT-II

2.a) A piston of mass 2.5 kg moves with a sinusoidal motion at 500 rpm. Stroke length = 120 mm. Calculate (a) Maximum velocity, (b) Maximum acceleration, and (c) Inertia force. (7M)

2.b) List differences between flywheel and governor. (7M)

(OR)

2.c) The fluctuation of energy of a machine is 3000 J. Mean speed is 400 rpm and allowable fluctuation in speed is 2%. Calculate the required moment of inertia of the flywheel. (14M)

UNIT-III

3.a) Explain the working of a spring-loaded Hartnell governor. (7M)

3.b) A Watt governor has arms 300 mm long and rotates at 60 rpm. Calculate the height of the governor. (7M)

(OR)

3.c) A ship has a rotor of 1000 kg, radius of gyration 0.75 m, spinning at 1800 rpm. The ship is pitching with angular velocity of 0.02 rad/s. Calculate the gyroscopic couple acting and state its direction. (14M)

UNIT-IV

4.a) Define balancing. Why is it necessary in rotating and reciprocating machines? (7M)

4.b) A shaft carries four masses A, B, C, and D of magnitudes 50 kg, 75 kg, 60 kg, and 40 kg at radii 0.2 m, 0.15 m, 0.2 m, and 0.25 m respectively. The angular positions of B, C, and D are 90°, 180°, and 270° from A respectively. Determine the magnitude and position of the balancing mass. (7M)

(OR)

4.c) Explain the procedure for balancing several masses rotating in different planes using graphical method. (14M)

UNIT-V

5.a) A mass of 5 kg is suspended by a spring with k=2000N/m. Calculate the natural frequency of free vibrations. (7M)

5.b) Differentiate between Free and Forced vibrations, Damped and Undamped vibrations (7M)

(OR)

5.c) Derive the equation of motion for damped free vibrations of a spring-mass-damper system and explain logarithmic decrement. (14M)

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BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)

III-B. Tech II-Semester Supplementary Examinations (BR20), April - 2026

HEAT TRANSFER (ME)

Time: 3 hours **Max. Marks: 70**

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*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

UNIT-I

1.a) Differentiate three modes of heat transfer? (7M)

1.b) A metal (k=45 W/m°C) steam pipe of 5 cm Inner Diameter and 6.5 cm Outer Diameter is lagged with 2.75 cm radial thickness of inside and outside surface are hi=4650 W/m^2K and ho=11.5 W/m^2K respectively, if the steam temperature is 200°C and ambient is 25°C, Calculate: i) heat loss per meter length of pipe, and ii) temperature at interfaces. (7M)

(OR)

1.c) Derive the generalized heat conduction equation in Cartesian co-ordinate system. (7M)

1.d) Derive one dimensional study heat conduction equation through a slab. (7M)

UNIT-II

2.a) Derive an expression for heat dissipation for an infinitely long fin. (7M)

2.b) A 50 cm x 50 cm copper slab, 6 mm thick at a uniform temperature of 350°C suddenly has its surface temperature lowered to 30°C. Find the time at which the slab temperature becomes 100°C. h = 100 W/m^2 °C. Also, find the rate of cooling after 60 seconds. (7M)

(OR)

2.c) Derive the expression for temperature distribution and heat transfer for a uniform cross sectional area of the fin with its end insulated. (7M)

2.d) Calculate the rate of heat transfer from a rectangular fin of length 2 cm, on a plane wall. Thickness of the fin is 2 mm and its breadth is 20 cm. Take T1 = 200^0C, h = $17.5/m^2$ ^{0}C, k = 52 W/m^0C. Assume the heat loss from the tip is negligible. (7M)

UNIT-III

3.a) Explain the concept of momentum and energy equation? (7M)

3.b) State and explain Buckingham π theorem. (7M)

(OR)

3.c) Using dimensional analysis prove: Nu = f(Re,Pr). (7M)

3.d) What do you understand by Nusselt number and Rayleigh number? Discuss their significance. (7M)

UNIT-IV

4.a) Discuss the criteria in natural convection to decide whether it is laminar or turbulent? (7M)

4.b) A vertical pipe 7.5 cm OD and 2.2 m long have a surface temperature of 95°C surrounded by air at 22°C, Estimate the rate of heat loss from the cylinder when i) vertical ii) horizontal. (7M)

(OR)

4.c) Air at 15°C and at a pressure of 1 atm is flowing along a flat plate at a velocity of 4.75 km/sec. If the plate is one meter wide and at 70 °C, find the quantities given below at x = 1m. (i) Hydrodynamic Boundary layer thickness. (ii) Local friction factor (iii) Average friction (iv) Local heat transfer co-efficient (v) Rate of heat transfer. (7M)

4.d) Under what conditions is the effectiveness-NTU method definitely preferred over the LMTD method in the analysis of a heat exchanger? (7M)

UNIT-V

5.a) Discuss the differences between drop-wise and film condensation. Which of the two is the more effective way of condensation and why? (7M)

5.b) A long pipe 40 mm in diameter passes through a room and is exposed to air at 35°C. The surface temperature of the tube is 95°C. Assuming the emissivity of the pipe as 0.6, estimate the radiation heat loss per meter length. (7M)

5.c) With the help of a neat sketch explain the various boiling regimes in the case of a pool boiling operation. (10M)

5.d) Two parallel rectangular surfaces 1m x 2m are opposite to each other at a distance of 4 m. The surfaces are black and at temperatures of 100^0C and 200^0C respectively. Calculate the net rate of heat exchange by radiation between the two surfaces. (4M)

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Course Code: **20ME6T11**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
III -B. Tech II-Semester Supplementary Examinations (BR20), APRIL-2026
CAD/CAM (MECH)

Time: 3 hours Max. Marks: 70

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*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

UNIT-I

1.a)	Why is it important to remove hidden lines and surfaces from 3D geometry?	(7M)
1.b)	Discuss the advantages and disadvantages of CAD/CAM	(7M)
	(OR)	
1.c)	List out the benefits and applications of CAD in an industry	14M

UNIT-II

2.a)	Explain different types of geometric modeling methods used in CAD. Give a comparative application of each of them	(7M)
2.b)	Write about Bezier surface modeling with a neat sketch.	(7M)
	(OR)	
2.c)	Discuss the important properties of Bezier surfaces	(7M)
2.d)	Describe the importance of curve and surface modeling in computer-aided graphics and design	(7M)

UNIT-III

3.a)	Give the advantages and disadvantages of numerical control of machine tools	(7M)
3.b)	Differentiate Manual part programming and Computer assisted part programming.	(7M)
	(OR)	
3.c)	What are the following G Functions for a machining centre? G17, G30, G81, G99	(7M)
3.d)	Differentiate between CNC and DNC machines.	(7M)

UNIT-IV

4.a)	Explain about Production Flow Analysis (PFA) with a neat sketch	14M
	(OR)	
4.c)	List the out functions and benefits of Group Technology.	(7M)
4.d)	Define capacity requirement planning and its implementation in a current manufacturing industry	(7M)

UNIT-V

5.a)	Define CMM? Explain different types of CMM with neat sketches.	(7M)
5.b)	Define FMS and explain different types of layout configurations with a neat sketch.	(7M)
	(OR)	
5.c)	Explain the differences between offline and online automated inspection	(7M)
5.d)	Write the advantages and disadvantages of CIM in manufacturing industry	(7M)

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Course Code: 20ME6D05

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
III -B. Tech II-Semester Supplementary Examinations (BR20), APRIL-2026
DESSIGN OF TRANSMISSION ELEMENTS (ME)

Time: 3 hours Max. Marks: 70

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*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

Note: 1. Data Book Allowed
2. Assume suitable data from the data book if required for the design.

UNIT-I

1.a) What is the function of transmission shaft? Discuss the various types of shafts and the standard sizes of transmissions shafts. (6M)

1.b) A steel spindle transmits 4 kW at 800 r.p.m. The angular deflection should not exceed 0.25° per metre of the spindle. If the modulus of rigidity for the material of the spindle is 84 GPa, find the diameter of the spindle and the shear stress induced in the spindle. (8M)

(OR)

1.c) What is a key? Mention different types of keys and state their applications. (6M)

1.d) Design a clamp coupling to transmit 30 kW at 100 r.p.m. The allowable shear stress for the shaft and key is 40 MPa and the number of bolts connecting the two halves are six. The permissible tensile stress for the bolts is 70 MPa. The coefficient of friction between the muff and the shaft surface may be taken as 0.3. (8M)

UNIT-II

2.a) State important desirable properties of a good lubricant should posses. (4M)

2.b) Design a journal bearing for a centrifugal pump from the following data : (10M)
Load on the journal = 20000 N; Speed of the journal = 900 r.p.m.; Type of oil is SAE 10, for which the absolute viscosity at 55°C = 0.017 kg / m-s; Ambient temperature of oil = 15.5°C; Maximum bearing pressure for the pump = 1.5 N / mm^2.
Calculate also mass of the lubricating oil required for artificial cooling, if rise of temperature of oil be limited to 10°C. Heat dissipation coefficient = 1232 $W/m^2/°C$.

(OR)

2.c) What are rolling contact bearings? Discuss their advantages over sliding contact bearings. (7M)

2.d) In a particular application, the radial load acting on a ball bearing is 5 kN and the expected life for 90% of the bearings is 8000 h. Calculate the dynamic load carrying capacity of the bearing, when the shaft rotates at 1450 rpm. (7M)

UNIT-III

3.a) Discuss the design procedure of spur gears. (4M)

3.b) A reciprocating compressor is to be connected to an electric motor with the help of spur gears. The distance between the shafts is to be 500 mm. The speed of the electric motor is 900 r.p.m. and the speed of the compressor shaft is desired to be 200 r.p.m. The torque, to be transmitted is 5000 N-m. Taking starting torque as 25% more than the normal torque, determine : (10M)
i) Module and face width of the gears using 20 degrees stub teeth, and ii) Number of teeth and pitch circle diameter of each gear. Assume suitable values of velocity factor and Lewis form factor.

(OR)

3.c) A pair of straight teeth spur gears is to transmit 20 kW when the pinion rotates at 300 r.p.m. The velocity ratio is 1:3. The allowable static stresses for the pinion and gear materials are 120 MPa and 100 MPa respectively. The pinion has 15 teeth and its face width is 14 times the module. Determine: (i) module; (ii) face width; and (iii) pitch circle diameters of both the pinion and the gear from the standpoint of strength, taking into consideration the effect of the dynamic loading. Check the gears for wear; given surface endurance strength is 600 MPa; Young's modulus of pinion and gear may be taken as 200 kN/mm^2 and 100 kN/mm^2 respectively. (14M)

UNIT-IV

4.a) Derive the expression for finding length of the open belt drive. (7M)

4.b) A belt drive consists of two V-belts in parallel, on grooved pulleys of the same size. The angle of the groove is 30°. The cross-sectional area of each belt is 750 mm^2 and μ = 0.12. The density of the belt material is 1.2 Mg/m^3 and the maximum safe stress in the material is 7 MPa. Calculate the power that can be transmitted between pulleys of 300 mm diameter rotating at 1500 r.p.m. Find also the shaft speed in r.p.m. at which the power transmitted would be a maximum. (7M)

(OR)

4.c) Discuss the materials and practical applications for the various types of springs. (6M)

4.d) A helical compression spring made of oil tempered carbon steel is subjected to a load which varies from 400 N to 1000 N. The spring index is 6 and the design factor of safety is 1.25. If the yield stress in shear is 770 MPa and endurance stress in shear is 350 MPa, find: i) Size of the spring wire, and ii) Diameters of the spring. (8M)

UNIT-V

5.a) State the function of the following for an internal combustion engine piston: (4M)
(i) Ribs ; (ii) Piston rings ; (iii) Piston skirt ; and (iv) Piston pin

5.b) The following data is given for the piston of a four-stroke diesel engine: (10M)
Cylinder bore = 250 mm; Maximum gas pressure = 4 MPa; Bearing pressure at small end of connecting rod = 15 MPa; Length of piston pin in bush of small end = 0.45D; Ratio of inner to outer diameter of piston pin = 0.6; Mean diameter of piston boss = 1.4 × outer diameter of piston pin; Allowable bending stress for piston pin = 84 N/mm^2.
Calculate: (i) outer diameter of the piston pin; (ii) inner diameter of the piston pin and (iii) mean diameter of the piston boss.

(OR)

5.c) Determine the dimensions of an *I*-section connecting rod for a petrol engine from the following data: (14M)
Diameter of the piston = 110 mm; Mass of the reciprocating parts = 2 kg; Length of the connecting rod from centre to centre = 325 mm; Stroke length = 150 mm; R.P.M. = 1500 with possible over speed of 2500; Compression ratio = 4:1; Maximum explosion pressure = 2.5 N/mm^2.

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BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
III- B. Tech II-Semester Supplementary Examinations (BR20), April - 2026
OPERATIONS RESEARCH (MEC)

Time: 3 hours **Max. Marks: 70**

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*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

UNIT-I

1.a) Write the characteristics of Operations Research. (7M)

1.b) Solve the following LPP using Two phase simplex method (7M)
Min. Z= x + y subject to constraints 2x + y ≥ 4, x + 7y ≥ 7 and x , y ≥ 0

(OR)

1.c) Solve the following LPP by simplex method (7M)
Max .z =5x+3y subject to constraints 3x+5y ≤ 15, 5x+2y ≤ 10, x, y ≥ 0

1.d) Explain graphical procedure to solve two variable LPP. (7M)

UNIT-II

2.a) Solve the following minimal Assignment (7M)

		Jobs			
		A	B	C	D
Persons	I	12	30	21	15
	II	18	33	9	31
	III	44	25	24	21
	IV	23	30	28	14

2.b) Explain Vogel's Approximation Method. (7M)

(OR)

2.c) A salesman has to visit five cities A,B,C,D and E. The distances (in hundred miles) between the five cities are as follows: (7M)

			To			
		A	B	C	D	E
	A	-	7	6	8	4
From	B	7	-	8	5	6
	C	6	8	-	9	7
	D	8	5	9	-	8
	E	4	6	7	8	-

If the salesman starts from city A and has to come back to city A, which route should he select so that the total distance travelled minimum?

2.d) Discuss Hungarian method to solve Assignment problem (7M)

UNIT-III

3.a) Solve the following game whose payoff matrix is given by (7M)

	strategies	Player B		
		I	II	III
Player A	I	10	5	-2
	II	13	12	13
	III	16	14	10

3.b)	The cost of a new machine is Rs. 5000. The maintenance cost of nth year is given by Rn=500(n-1), n=1, 2,…..suppose that the discount rate per year is 0.5 .After how many years it will be economical to replace the machine by a new one?	(7M)
	(OR)	
3.c)	When do you use dominance property and explain the rules.	(7M)
3.d)	A machine costs Rs. 10,000. Operating costs are Rs. 500/- per year for the first five years. In the sixth and succeeding years operating cost increases by Rs. 100/- per year. Assuming a 10% discount rate of money per year, find the optimum length of time to hold the machine before we replace it.	(7M)
	UNIT-IV	
4.a)	Explain the procedure to solve n jobs through three machines with example.	(7M)
4.b)	A one person barber shop has six chairs to accommodate people waiting for haircut. Assume that customers who arrive when all the six chairs are full leave without entering the shop. Customers arrive at the average rate of 3 per hour and spend an average of 15 minutes for service. Find (i) the probability that a customer can get directly into the barber chair upon arrival.(ii) expected number of customers waiting for haircut.	(7M)
	(OR)	
4.c)	Find the sequence that minimises the total elapsed time (in hrs) required to complete all the following jobs on machines A,B,C in the order BCA.	(7M)

Job	1	2	3	4	5
Machine A	8	10	6	7	11
Machine B	4	9	8	6	5
Machine C	5	6	2	3	4

4.d)	Explain(i) queue discipline (ii) customer behaviour	(7M)
	UNIT-V	
5.a)	The following information is given and time duration in weeks:	(14M)

Activity	1-2	2-3	2-4	3-5	4-6	5-6	5-7	6-7
t_p	3	9	6	8	8	0	5	8
t_m	3	6	4	6	6	0	4	5
t_o	3	3	2	4	4	0	3	2

Draw the network for the above. Determine (i) Critical path and expected project length (iii) The probability that the project will be completed in 23 weeks.

(OR)

5.c) A small project is having seven activities. The relevant data about these activities is given below: (14M)

Activity	Normal time(days)	Crash time(days)	Normal cost(Rs.)	Crash cost(Rs.)
1-2	6	4	50	80
1-3	5	3	80	150
2-4	5	2	60	90
2-5	8	6	100	300
3-4	5	2	140	200
4-5	2	1	60	80

If the indirect cost is Rs.20 per day, crash the activities to find the minimum duration of the project and project cost associated.

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BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
III -B. Tech II-Semester Supplementary Examinations (BR20), April-2026
VLSI DESIGN (ECE)

Time: 3 hours **Max. Marks: 70**

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*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

UNIT-I

1.a)	Explain in detail about the steps involved in CMOS IC fabrication process with essential diagrams.	(7M)
1.b)	Explain the basic operation of enhancement mode transistor.	(7M)
	(OR)	
1.c)	Describe the complete IC production process from wafer preparation to packaging.	(7M)
1.d)	Differentiate between CMOS and Bipolar technologies. Explain their advantages, disadvantages, and suitable applications.	(7M)

UNIT-II

2.a)	Discuss the factors affecting the threshold voltage (V_T) of a MOS transistor. Derive the expression for V_T.	(7M)
2.b)	Derivation of pull up to pull down ratios of n-mos inverter driven by n-mos inverter	(7M)
	(OR)	
2.c)	With neat diagram, explain the working of a Bi-CMOS inverter.	(7M)
2.d)	What is a latch? Draw and explain the operation of a basic CMOS latch circuit.	(7M)

UNIT-III

3.a)	Explain the design rules in VLSI layout. Differentiate between lambda-based rules and micron-based rules with examples.	(7M)
3.b)	Explain the function of wires and vias in a VLSI layout.	(7M)
	(OR)	
3.c)	Explain 2μm CMOS design rules	(7M)
3.d)	Draw the schematic, stick diagram and layout for CMOS Inverter	(7M)

UNIT-IV

4.a)	Give any six scaling factors for device parameters.	(7M)
4.b)	Calculate on resistance of an inverter from VDD to GND. If n- channel sheet resistance Rsn=104 Ω per square and P-channel sheet resistance Rsp = 3.5 × 104 Ω per square. (Zpu=4:4 and Zpd=2:2).	(7M)
	(OR)	
4.c)	What is a standard unit of capacitance in VLSI?	(7M)
4.d)	Define delay unit. Explain the concept of inverter delay and how it is affected by load capacitance and driving strength.	(7M)

UNIT-V

5.a)	Explain the FPGA design flow. Describe each stage involved from HDL design to configuration.	(7M)
5.b)	Explain the architecture and features of the Altera FLEX 8000 FPGA family.	(7M)
	(OR)	
5.c)	Explain about XILINX xc 4000 series FPGA.	(7M)
5.d)	Explain about logic synthesis.	(7M)

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BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
III B.Tech II Semester Supplementary Examinations (BR20), April-2026
DIGITAL SIGNAL PROCESSING (ECE)

Time: 3 hours Max. Marks: 70

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*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

UNIT-I

1.a) Discuss the concept of stability and causality with examples. (7M)

1.b) Find the linear, invariance and casuality of given system: (7M)

$$y(n) = x(n) - ax(n - 1)$$

(OR)

1.c) Define an LTI System and show that the output of an LTI system is given by the convolution of Input sequence and impulse response. (7M)

1.d) Write the properties of ROC of X(z). (7M)

UNIT-II

2.a) Compute 4-point DFT of a sequence x (n) = { 0,1,2,3} using DIT algorithm. (7M)

2.b) Find the IDFT of the sequence using DIF algorithm (7M)
X (k) = {10, -2-j2, -2, -2+j2}.

(OR)

2.c) Define DFT and then state and prove properties of DFT. (14M)

UNIT-III

3.a) Write the transfer function of unnormalized butterworth low pass filter. (7M)

3.b) Using Bilinear transformation, design a high pass filter, monotonic in pass band with cutoff frequency of 1000 Hz and down 10dB at 350 Hz. The sampling frequency is 5000 Hz. (7M)

(OR)

3.c) Explain the procedure for designing Analog filters using the Chebyshev approximation. (14M)

UNIT-IV

4.a) Write the steps in the design of FIR filters. (7M)

4.b) Compare the hamming and Kaiser windows. (7M)

(OR)

4.c) Design a FIR digital low-pass filter with a cutoff frequency of 1 kHz and a sampling rate of 4 kHz with 7 samples using Fourier series method. (14M)

UNIT-V

5.a) Obtain the necessary expression for interpolation process. (7M)

5.b) Discuss the applications of multi-rate signal processing. (7M)

(OR)

5.c) Explain the effect of aliasing in decimation with the frequency spectrum and discuss how the aliasing can be eliminated. (14M)

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BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
III B.Tech II Semester Supplementary Examinations (BR20), April-2026
MICROWAVE AND OPTICAL COMMUNICATION(ECE)

Time: 3 hours Max. Marks: 70

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*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

UNIT-I

1.a)	Compare TE and TM mode of propagation in a rectangular wave Guides .	(7M)
1.b)	The dimensions of a rectangular waveguide are 3 cm × 1.2 cm, operating at a frequency of 10 GHz. Find the following: i) Possible modes ii)Cut-off frequency for the dominant mode (TE_{10}) iii)Guide wavelength iv)Phase velocity.	(7M)

(OR)

1.c)	Explain the applications of microwaves? Why TEM waves cannot propagate through rectangular wave guides.	(7M)
1.d)	Define and Derive Dominant mode of TE mode of propagation in a rectangular wave guide.	(7M)

UNIT-II

2.a)	Explain the operation of two cavity klystron.	(7M)
2.b)	Explain how the RWH theory supports the operation of a Gunn Diode.	(7M)

(OR)

2.c)	What are the different types of slow wave structure and write its characteristics.	(7M)
2.d)	How to change the frequency of oscillations in Reflex klystron Tube.	(7M)

UNIT-III

3.a)	Explain the operation single hole and multi hole directional couplers.	(7M)
3.b)	Draw and explain block diagram of microwave bench setup.	(7M)

(OR)

3.c)	Explain the applications of Magic Tee.	(7M)
3.d)	Define S matrix? Derive the S matrix for Two-Port Network and Write down the properties of S matrix.	(7M)

UNIT-IV

4.a)	Explain about Step Index and Graded index fibers.	(7M)
4.b)	What are the different losses in optical fiber cables and explain.	(7M)

(OR)

4.c)	Draw and explain optical fiber communication system.	(7M)
4.d)	A Light Ray is incident from medium-1 to medium-2 .If the R.I of medium -1and 2 are 1.5 and 1.36 respectively then determine the angle of refraction for and angle of incidence of 30 degrees	(7M)

UNIT-V

5.a)	Discuss about the point to point fiber optic link and its characteristics with an example.	(7M)
5.b)	Explain briefly about LED structures	(7M)

(OR)

5.c)	What is a link power budget in optical communication?	(7M)
5.d)	What is the pulse spreading when a laser diode having a 2nm spectral width is used. Find the material dispersion induced pulse spreading at 1550nm for an LED with a75nm spectral width	(7M)

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BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
III-B.Tech II-Semester Supplementary Examinations (BR20), April- 2026
DIGITAL IMAGE PROCESSING (ECE)

Time: 3 hours Max. Marks: 70

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*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

UNIT-I

1.a) Explain 2D FFT with its properties (Minimum four). (7M)

1.b) Explain the elements of visual perception. (7M)

(OR)

1.c) Explain mathematical tools in digital image processing. (7M)

1.d) Explain the Discrete cosine transform matrix for order N=4 and DCT Properties. (7M)

UNIT-II

2.a) Explain the following operations for image enhancement: (7M)
i) Contrast stretching ii) Bit-plane slicing iii) Image negative.

2.b) Explain smoothing and sharpening spatial domain filters for image enhancement. (7M)

(OR)

2.c) Justify how image is sharpen by using ideal, Butterworth and gaussian high pass filters for Image enhancement. (7M)

2.d) Compute the mean filter for the image using a 3 x 3 neighbourhood by assuming zero padding. (7M)

1	2	3	2
4	2	5	1
1	2	6	3
2	6	4	7

UNIT-III

3.a) Explain linear position invariant degradation. (7M)

3.b) Explain wiener filtering (mean square error) and Inverse filtering with its advantages. (7M)

(OR)

3.c) Describe constrained least square filtering technique for image restoration and derive its transfer function. (7M)

3.d) Explain the various mean filters for image restoration (7M)

UNIT-IV

4.a) Briefly describe RGB, CMY, HSI color models. (7M)

4.b) Explain color image smoothing operations in spatial and frequency domain for enhancement. (7M)

(OR)

4.c) Convert RGB to HSI and HSI to RGB color model. (7M)

4.d) Explain about pseudo color image processing with intensity slicing. (7M)

UNIT-V

5.a) Analyze all edge detectors available in image segmentation. (7M)

5.b) A source with message sequence as a1 a2a3a4 with 4 symbols. The probabilities are P(a1)=0.2,P(a2)=0.2, P(a3)=0.4,P(a4)=0.2. Find out the arithmetic value with arithmetic coding. (7M)

(OR)

5.c) Explain about image compression model with the help of a block diagram. (7M)

5.d) Explain lossy image compression with neat diagrams. (7M)

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Course Code: 20AD6E01

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
III -B. Tech II-Semester Supplementary Examinations (BR20), APRIL-2026
DOT NET TECHNOLOGIES (ECE, CSE_AI&DS)

Time: 3 hours **Max. Marks: 70**

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*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

UNIT-I

1.a)	With a neat sketch explain the .NET architecture.	(7M)
1.b)	Explain the concept of class libraries with an example.	(7M)
	(OR)	
1.c)	What is MSIL? List and explain the features of MSIL.	(7M)
1.d)	Show the procedure for download and installation of visual studio community edition 2022.	(7M)

UNIT-II

2.a)	Interpret about boxing and unboxing.	(7M)
2.b)	Explore any two conditional statements with an example.	(7M)
	(OR)	
2.c)	Narrate about regular expressions with example.	(7M)
2.d)	Illustrate the string operations: compare(), concat() and copy().	(7M)

UNIT-III

3.a)	Elucidate about windows forms and controls.	(7M)
3.b)	Infer about data base programming in Dot NET.	(7M)
	(OR)	
3.c)	Elaborate about ADO.NET and its connection with XML.	(7M)
3.d)	Depict the command builder and data relations.	(7M)

UNIT-IV

4.a)	Summarize the different data types in SQL servers.	(7M)
4.b)	Outline primary key and foreign key with examples.	(7M)
	(OR)	
4.c)	How to create, read, update & delete data in tables? Explain with SQL Queries.	(7M)
4.d)	Illustrate with an example explain the working process of triggers.	(7M)

UNIT-V

5.a)	What is the purpose of the routing system in ASP.NET MVC? How does ASP.NET MVC map a URL to an action method?	(7M)
5.b)	Enlighten the steps involved in preparing an ASP.NET MVC application for deployment.	(7M)
	(OR)	
5.c)	Elaborate about deployment server requirement configuration.	(7M)
5.d)	Prepare an application for deployment deploying to IIS and windows azure.	(7M)

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BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE:ODALAREVU
(AUTONOMOUS)

III-B. Tech II-Semester SupplementaryExaminations (BR20), April - 2026

COMPILER DESIGN

(Common to CSE & CSE (AI&DS)AI&ML & CSE(AI&ML))

Time: 3 hours **Max. Marks: 70**

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*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

UNIT-I

1.a) What are the different translation rules of a LEX Program. (7M)

1.b) Discuss in brief about Bootstrapping process with suitable diagram. (7M)

(OR)

1.c) Show the output generated by each phase for the following expression x=(a+b)*(c+d) (7M)

1.d) Explain various data structures used for lexical analysis. (7M)

UNIT-II

2.a) What is ambiguous grammar? Eliminate ambiguities for the grammar, E→E+E | E*E | (E) | id (7M)

2.b) Consider the following grammar (7M)

S→0A|1B|0|1

A→0S|1B|1

B→0A|1S

Construct a parse tree, leftmost and rightmost derivation for the string 1100101

(OR)

2.c) Discuss in about left recursion and left factoring with examples (7M)

2.d) Discuss the concept of error recovery in predictive parsing. (7M)

UNIT-III

3.a) Construct an LALR Parsing table for the following grammar: E-> E+T |T (7M)
T-> T*F|F
F->id

3.b) Discuss about the Dangling-Else ambiguity. (7M)

(OR)

3.c) What are the limitations of recursive descent parser (7M)

3.d) Find the SLR parsing table for the given grammar: E->E+E | E*E | (E) | id. And parse the sentence (a+b)* (7M)

UNIT-IV

4.a) Discuss the concept of backpatching with an example. (7M)

4.b) Write the quadruples, triples and indirect triples for the expression (a + b) *(c + d) *(a + b + c) (7M)

(OR)

4.c) What is a type expression? Explain the equivalence of type expressions with an appropriate example. (7M)

4.d) What is syntax directed definition? Give SDT for a simple desk calculator.. (7M)

UNIT-V

5.a) Explain the issue and the difference between the heap allocated activation records versus stack allocated activation records (7M)

5.b) Discuss in detail about the basic blocks and flow graphs with an example. (7M)

(OR)

5.c) Explain different principal sources of optimization technique with suitable examples. (7M)

5.d) Discuss about copy propagation and dead code elimination (7M)

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BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
III B.Tech II Semester Supplementary Examinations (BR20), April - 2026
DATA MINING AND DATA WARE HOUSING (CSE,CSE(AI&DS))

Time: 3 hours Max. Marks: 70

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*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

UNIT-I

1.a)	Discuss why data mining is important.	(7M)
1.b)	Elaborate what kind of patterns can be mixed.	(7M)
	(OR)	
1.c)	Discuss data mining primitives.	(7M)
1.d)	Explain major issues in data mining.	(7M)
	UNIT-II	
2.a)	Discuss concept of pre processing.	(7M)
2.b)	Explain major issues in data mining.	(7M)
	(OR)	
2.c)	Explain data discretization.	(7M)
2.d)	Describe the data ware house architecture with neat diagram.	(7M)
	UNIT-III	
3.a)	Explain frequent item set generator.	(7M)
3.b)	Explain rule generation with example.	(7M)
	(OR)	
3.c)	Discuss compact representation of frequent item sets.	(7M)
3.d)	Discuss FP growth algorithm with example.	(7M)
	UNIT-IV	
4.a)	Discuss algorithm for decision tree induction.	(7M)
4.b)	Elaborate general approach to solve a classification problem.	(7M)
	(OR)	
4.c)	What are Bayesian belief networks.	(7M)
4.d)	How a Naive Bayer classifier works? Explain with example.	(7M)
	UNIT-V	
5.a)	Explain different types of clustering.	(7M)
5.b)	Discuss Agglomerative Hierarchal clustering.	(7M)
	(OR)	
5.c)	Explain basic k-means algorithm.	(7M)
5.d)	Describe DBSCAN algorithm.	(7M)

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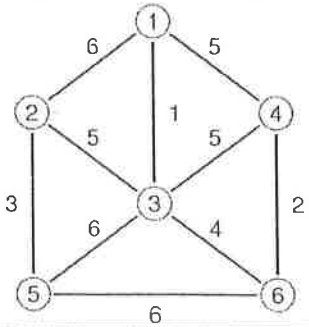
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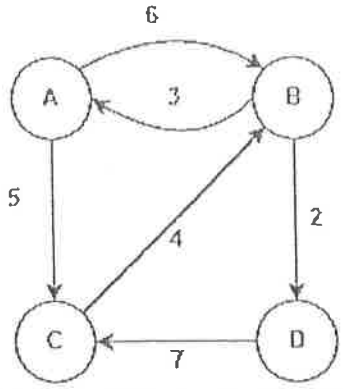
BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
III-B.Tech II-Semester Supplementary Examinations (BR20), April-2026
DESIGN AND ANALYSIS OF ALGORITHMS (CSE)

Time: 3 hours Max. Marks: 70

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*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

	UNIT-I	
1.a)	Analyse the time and space complexity of the linear search algorithm.	(7M)
1.b)	Explain the three basic asymptotic notations in detail with examples.	(7M)
	(OR)	
1.c)	Analyse the time complexity of the recursive algorithm for solving the Tower of Hanoi problem.	(7M)
1.d)	Determine the asymptotic upper bound of the following recurrence equations using the Master's Theorem: a. $T(n) = 3T(n/2)+n^2$ b. $T(n) =2T(n/2)+n\log n$	(7M)
	UNIT-II	
2.a)	Explain the Binary Search algorithm and analyse its complexity.	(7M)
2.b)	Apply Merge sort algorithm to sort the following numbers in ascending order. A = [25, 7, 34, 2, 70, 9, 61, 16, 49, 19]	(7M)
	(OR)	
2.c)	Explain the divide and conquer algorithm for the defective chessboard problem.	(7M)
2.d)	Explain the Quick Sort algorithm and analyse its best-case and worst-case efficiencies.	(7M)
	UNIT-III	
3.a)	Explain the greedy algorithm for solving Job Sequencing Problem with suitable example.	(7M)
3.b)	Explain Dijkstra's Algorithm for finding the single-source shortest path problem with an example.	(7M)
	(OR)	
3.c)	Explain Prim's algorithm for finding the minimum spanning tree of a given graph.  	(7M)
3.d)	Solve the optimal merge pattern for a list of file sizes [5, 3, 2, 7, 9, 13] using a greedy technique.	(7M)
	UNIT-IV	
4.a)	Apply dynamic programming to solve the matrix chain multiplication problem for a sequence of matrices with the following dimensions: 4 x 10, 10 x 3, 3 x 12, 12 x 20, and 20 x 7.	(7M)
4.b)	Explain Floyd's Algorithm for determining the shortest paths between all pairs of vertices in a given graph.	(7M)

		
	(OR)	
4.c)	Apply dynamic programming to solve the 0/1 knapsack problem. Given sets of profits P = {1, 2, 5, 6} and weights W={2, 3, 4, 5}, with the number of items N=4 and a knapsack capacity of W =8 and explain the steps involved in finding the maximum profit.	(7M)
4.d)	Analyse and compare the greedy and dynamic programming approaches in terms of their strategies, efficiency and problem-solving capabilities.	(7M)
	UNIT-V	
5.a)	Apply backtracking to solve the following instance of the subset sum problem: A={5,2,1,3,9} and d = 9	(7M)
5.b)	Write an algorithm to solve the n-queens problem using the backtracking technique.	(7M)
	(OR)	
5.c)	Write an algorithm to solve the Hamiltonian Cycle problem using backtracking with suitable example.	(7M)
5.d)	Explain the graph-coloring problem and draw the state space tree for m=3 colors and n=4 vertices. Discuss the time and space complexity.	(7M)

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BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
III-B.Tech II-Semester Supplementary Examinations (BR20), April - 2026
Machine Learning (CSE)

Time: 3 hours Max. Marks: 70

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*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

UNIT-I

1.a) Explain different types of Learning systems. (7M)

1.b) Explain the distinction between training, testing and validation in machine learning. (7M)

(OR)

1.c) Explore various goals and applications of machine learning in different domains such as healthcare, finance, and natural language processing. (7M)

1.d) Explain Confusion Matrix and also Illustrate Bias and Variance Trade-off with neat sketch. (7M)

UNIT-II

2.a) List three Node impurity measures for attribute selection measure and Construct Decision Tree for the given dataset using one of the node impurity measures. (14M)

Tid	Refund	Marital Status	Taxable Income	Class
1	Yes	Single	High	Yes
2	No	Married	Medium	No
3	No	Single	Low	Yes
4	Yes	Divorced	High	No
5	No	Divorced	Medium	Yes
6	No	Married	Low	No
7	Yes	Divorced	High	No
8	No	Married	Low	Yes
9	No	Married	Low	No
10	No	Single	Medium	Yes

(OR)

2.c) Illustrate experimental evaluation of Learning algorithms. (7M)

2.d) Explain the ID3 (Iterative Dichotomiser 3) algorithm for decision tree learning. Discuss the steps involved in the ID3 algorithm and how it builds decision trees. (7M)

UNIT-III

3.a) Differentiate the concept of learning Propositional and First-Order rule lists using decision trees. (7M)

3.b) Discuss how decision trees contribute to the creation of rule lists and their application in descriptive rule learning. (7M)

(OR)

3.c) Explain Probably approximately correct (PAC) learning. (7M)

3.d) Illustrate sample complexity for infinite hypothesis spaces. (7M)

UNIT-IV

4.a)	Define Support Vector Machine and discuss its use in classification.	(7M)
4.b)	Explain Quadratic programming solution to find maximum margin separators.	(7M)

(OR)

4.c)	Explain the procedure involved in using kernels for complex data.	(7M)
4.d)	Classify linear SVM & non-linear SVM	(7M)

UNIT-V

5.a)	Define Naive Bayes and discuss its assumptions. Explain how the Naive Bayes algorithm works in classification tasks.	(7M)
5.b)	Differentiate Bayes nets and Markov nets for representing dependencies.	(7M)

(OR)

5.c)	Explore the computational geometry aspects of KNN, including Voronoi Diagrams and Delaunay Triangulations.	(7M)
5.d)	Explain the concept of logistic regression and its application in classification problems.	(7M)

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Course Code: 20CS6E03

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
III-B.Tech II-Semester Supplementary Examinations (BR20), April - 2026
MEAN STACK DEVELOPMENT (CSE)

Time: 3 hours Max. Marks: 70

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*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

UNIT-I

1.a) Create a login form using <form> tag and apply CSS3 Properties. (7M)
1.b) What is XML schema and show how XML schema can be created? (7M)

(OR)

1.c) Design a page with table layout as given below by using cellspacing and cellpadding as 5 and 7. (8M)

TABLE EXAMPLE

STUDENT CGPA

ROLL-NO	YEAR	SGPA
BVC01	I	8.92
BVC01	II	8.02

1.d) Differentiate between DOM and SAX. (6M)

UNIT-II

2.a) What is JavaScript? Describe primitive data types that JavaScript uses. (7M)
2.b) Using Angular JS differentiate expression and $eval with proper example. (7M)

(OR)

2.c) Create a login form with userID and Password with validation of the two fields after submission of the form. (7M)
2.d) Print sum of even numbers by passing n to function for range of even numbers to be considered by using JavaScript. (7M)

UNIT-III

3.a) Write short note on Node.js by including its advantages in technology. (6M)
3.b) With an example explain middleware and how it works in Express.js. (8M)

(OR)

3.c) Briefly write about Modules, its types and give at least two modules for each of its type. (6M)
3.d) By using Express implement MVC architecture. (8M)

UNIT-IV

4.a) What is RESTful? Explain the advantages of using Uniform Interface. (6M)
4.b) Write a note on virtual DOM and explain its working. (8M)

(OR)

4.c) Develop an application to give alert message as "**MEAN STACK DEVELOPMENT**" by clicking on the "**SUBJECT**" Button. (8M)
4.d) Explain in detail about DOM Rendering. (6M)

UNIT-V

5.a) What is Mongo DB? Explain its architecture. (7M)
5.b) Create a Mongo DB for an employ with details as (empID, empName and Designation) (7M)

(OR)

5.c) Write short notes on web hosting for the developed applications. (6M)

5.d) Create collection in Mongo DB with Student Database having minimum of 3 records with RollNo, Name and SGPA? (8M)

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Course Code: 20AD6T05

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
III -B. Tech II-Semester Supplementary Examinations (BR20), APRIL-2026
DEEP LEARNING (CSE_AI&DS, AI&ML, CSE_AI&ML)

Time: 3 hours Max. Marks: 70

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*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

UNIT-I

1.a)	Define Artificial Intelligence and explain its relationship with Machine Learning.	(7M)
1.b)	List and briefly describe different types of probabilistic models used in Machine Learning.	(7M)

(OR)

1.c)	Compare Decision Trees and Random Forests. How do they differ in handling overfitting?	(7M)
1.d)	Given a dataset, how would you determine if your model is underfitting or overfitting? Propose a strategy to address underfitting.	(7M)

UNIT-II

2.a)	Describe the key differences between biological and artificial neural networks.	(7M)
2.b)	Explain the role of activation functions in training deep networks.	(7M)

(OR)

2.c)	Suppose a neural network is not learning properly. Identify possible reasons and suggest ways to improve its performance.	(7M)
2.d)	Analyze the importance of weight initialization in deep networks. How does it impact the learning process?	(7M)

UNIT-III

3.a)	What are the key components of a neural network? Briefly describe each.	(7M)
3.b)	Explain the difference between TensorFlow, Theano, and Keras. Why is Keras often preferred?	(7M)

(OR)

3.c)	Implement a binary classification model in Keras to classify movie reviews as positive or negative.	(7M)
3.d)	Evaluate the performance of a multiclass classification model. What factors would you consider in improving its accuracy?	(7M)

UNIT-IV

4.a)	Define convolutional layers and explain their significance in CNNs.	(7M)
4.b)	Describe how recurrent neural networks (RNNs) process sequential data differently from traditional neural networks.	(7M)

(OR)

4.c)	Write a PyTorch program to implement a simple CNN for image classification.	(7M)
4.d)	Analyze the advantages and limitations of using PyTorch tensors for deep learning applications.	(7M)

UNIT-V

5.a)	What are Generative Adversarial Networks (GANs)? Describe their basic working principle.	(7M)
5.b)	Explain the role of reinforcement learning in deep learning applications.	(7M)

(OR)

5.c)	Implement a simple autoencoder model and explain its application in feature learning.	(7M)
5.d)	Analyze the advantages of Deep Belief Networks over Restricted Boltzmann Machines. In what scenarios would one be preferable over the other?	(7M)

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Course Code: 20AD6D04

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
III-B.Tech II-Semester Supplementary Examinations (BR20), April - 2026
DESIGN AND ANALYSIS OF ALGORITHMS (CSE(AI&DS))

Time: 3 hours **Max. Marks: 70**

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*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

UNIT-I

1.a) Explain Big-Oh, Omega and Theta notations in algorithm analysis with an example for each. (7M)

1.b) What is time complexity? Explain different methods of finding time complexity with examples. (7M)

(OR)

1.c) List and briefly discuss a sequence of steps for designing and analyzing an algorithm. (7M)

1.d) Write a recursive function to compute the GCD of two given numbers. Solve the recurrence relation for its time complexity. (7M)

UNIT-II

2.a) Apply quick sort technique to sort the list of elements L={54,26,93,17,77,31,44,55,20} by using pivot element and also analyze its time complexity. (7M)

2.b) Write an algorithm for performing Binary Search. (7M)

(OR)

2.c) Solve the problem of defective chess board using divide and conquer strategy? (7M)

2.d) Implement an algorithm for Merge Sort. Explain with the given example and analyze the time complexity. 28,45,27,36,47,38,65,78,50,12. (7M)

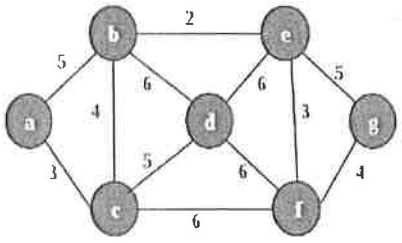
UNIT-III

3.a) Write the general principle of greedy method. (7M)

3.b) What is spanning tree? Explain about minimum cost spanning trees with examples. (7M)

(OR)

3.c) Analyze the time complexity of Prim's to find MST for the following graph. (14M)

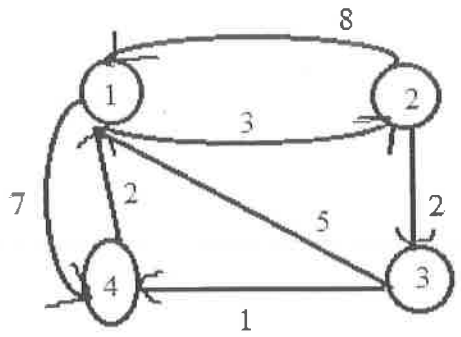


UNIT-IV

4.a) Consider the knapsack instance with n=4, M=15, P=(10,10,12,18) and W=(2,4,6,9). Find solution using Dynamic programming approach (14M)

(OR)

4.c) Find the shortest path of the following by using all pairs shortest path. (7M)



4.d) Explain matrix chain multiplication problem using dynamic programming with example. (7M)

UNIT-V

5.a) Let n=6 and w={5,10,12,13,15,18} Find all subsets whose sum of weights is 30; and also draw the portion of state space tree generated. (7M)

5.b) Explain about Directed Hamiltonian cycle and prove that it is NP hard problem (7M)

(OR)

5.c) Explain the Graph – coloring problem. And draw the state space tree for m= 3 colors n=4 vertices graph. (7M)

5.d) Draw the portion of state space tree for 4 queen's problem using variable tuple sized approach. (7M)

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Course Code: **20EC6E02**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
III -B. Tech II-Semester Supplementary Examinations (BR20), APRIL-2026
MICROCONTROLLERS AND APPLICATIONS
CSE(AI&DS), AIML & CSE(AI&ML)

Time: 3 hours Max. Marks: 70

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*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

UNIT-I

1.a)	Explain the internal and external memory organization of the 8051 microcontroller.	(14M)
	(OR)	
1.c)	Briefly explain & Draw the 8051 architecture of microcontroller.	(7M)
1.d)	What are interrupts in microcontrollers? List the different interrupts in 8051 and their priorities.	(7M)

UNIT-II

2.a)	Write a program to perform addition and subtraction of two numbers in 8051 and explain	(7M)
2.b)	Explain the program flow control instructions in 8051. Illustrate with example programs.	(7M)
	(OR)	
2.c)	Explain addressing modes of 8051 microcontroller and with their examples.	(14M)

UNIT-III

3.a)	Describe the concept of non-maskable interrupts (NMI) with suitable examples.	(7M)
3.b)	Explain how polling is used to identify the interrupt source and how priorities are assigned.	(7M)
	(OR)	
3.c)	Explain the interrupt handling structure of a microcontroller with a neat diagram.	(14M)

UNIT-IV

4.a)	In how many ways we can program a Timer in MCU.	(7M)
4.b)	Explain the free running counter and real time controls.	(7M)
	(OR)	
4.c)	Describe the working and configuration of timers in the 8051 microcontroller.	(7M)
4.d)	Differentiate between Timer and Counter modes in the 8051.	(7M)

UNIT-V

5.a)	Describe the interfacing of an LED and an array of LEDs with the 8051.	(7M)
5.b)	Explain the interfacing of a matrix keypad with the 8051 and its scanning technique.	(7M)
	(OR)	
5.c)	What is the 8279 keyboard-cum-display controller? Explain its features and interfacing method.	(14M)

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Course Code: **18EE6T14**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
III-B.Tech II-Semester Supplementary Examinations (BR18), APRIL-2026

POWER SYSTEM ANALYSIS (EEE)

Time: 3 hours Max. Marks: 60

Question Paper consists of Part-A and Part-B
*Answer **ALL** the question in **Part-A***
*Answer any **FOUR** Questions from **Part-B***

PART–A (6X2 = 12M)

1. a)	What are Planar & Non-Planar graphs?	(2M)
b)	Mention the assumptions used in Fast Decoupled solution method.	(2M)
c)	How to frame Z–Bus matrix?	(2M)
d)	Classify the faults occurred in power system	(2M)
e)	Classify the types of symmetrical components used in power system.	(2M)
f)	List the types of stability in power system.	(2M)

PART–B (4X12 = 48M)

2.a)	Describe the formation of Y_{BUS} with an example.	(6M)
b)	Explain the oriented graph and formulate the following: (i)Element node incidence matrix, (ii) Bus incidence matrix, (iii) Basic cutset incidence matrix, (iv) Basic loop incidence matrix.	(6M)
3.a)	Explain the Building Algorithm for any two types of modification for formatting Zbus.	12M
4.a)	Determine Z_{BUS} by using NR method.	(6M)
b)	Classify the buses used in power system analysis.	(6M)
5.a)	Obtain the expression for fault current of LL fault.	(6M)
b)	Illustrate the selection of reactors in synchronous machine.	(6M)
6.a)	Describe the sequence impedance and networks of a synchronous machine	(6M)
b)	The voltage across a 3 phase unbalanced load are $V_a = 300\angle 20^0$V, $V_b = 360\angle 90^0$ V and $V_c = 500\angle -140^0$ V. Determine the symmetrical components of voltages. Phase sequence is abc.	(6M)
7.a)	Derive the swing equation of a synchronous machine.	(6M)
b)	Improve the methods transient state power limit of a power system.	(6M)

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Course Code: 18CS6T15

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
III-B. Tech II-Semester Supplementary Examinations (BR18), April – 2026.

JAVA PROGRAMMING (EEE)

Time: 3 hours **Max. Marks: 60**

Question Paper consists of Part-A and Part-B
*Answer **ALL** the question in **Part-A***
*Answer any **FOUR** Questions from **Part-B***

PART–A (6X2 = 12M)

1. a)	What is this keyword in java?	(2M)
b)	Define Polymorphism.	(2M)
c)	What is CLASSPATH?	(2M)
d)	Differentiate process and thread	(2M)
e)	List any 2 differences between Applet and Application	(2M)
f)	What do you mean by scroll bar?	(2M)

PART–B (4X12 = 48M)

2.a)	Explain the features of java in detail?	(6M)
b)	Explain the following decision control statements: (i) if-else statement (ii)do-while (iii) break	(6M)
3.a)	What is constructor? Explain with program?	(6M)
b)	Demonstrate constructor overloading concept?	(6M)
4.a)	Define package? What are the different predefined packages available in java?	(5M)
b)	Explain different types of inheritance in java.	(7M)
5.a)	Explain thread synchronization with an example?	(6M)
b)	Explain random access file operations with suitable program?	(6M)
6 a)	What is the role of event Listeners in event handling? List the java event listeners? Give an example.	(12M)
7 a)	Explain the following AWT components. a) Button b)Label	(6M)
7 b)	Explain different layout managers in java	(6M)

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Course Code: 18ME6T17

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
III B.Tech II-Semester Supplementary Examinations (BR18), April - 2026
DESIGN OF MACHINE MEMBERS-II (ME)

Time: 3 hours Max. Marks: 60

Question Paper consists of Part-A and Part-B
*Answer **ALL** the question in **Part-A***
*Answer any **FOUR** Questions from **Part-B***

PART–A (6X2 = 12M)

1. a)	What is a piston slap? How it can be controlled?	(2M)
b)	State the applications of bearings.	(2M)
c)	What are the different types of mechanical drives?	(2M)
d)	What is law of gearing?	(2M)
e)	Why hollow piston pin is preferred to a solid one?	(2M)
f)	What is meant by creep of a belt and what is its effect?	(2M)

PART–B (4X12 = 48M)

2.a)	What is equivalent static load and equivalent dynamic load?	(3M)
b)	A shaft rotating at 1440 rpm is supported by two bearings. The forces acting on each bearing are 6000N radial load and 3500 N axial thrust. If the shaft diameter is 40mmand the expected life of the bearing is 500h, select a suitable bearing if the required reliability of the bearing is to be 99 percent.	(9M)
3.a)	What are the stresses induced in Crankshafts?	(3M)
b)	Design an overhung crankshaft with two main bearings for an I.C engine with the following data: Cylinder bore=250 mm, Stroke length=300 mm, Flywheel weight=25 kN, Maximum pressure=2.5 N/mm^2, Maximum torque at crank rotation 300, the pressure at that instant = 1.7 N / mm^2.	(9M)
4.a)	What are the assumptions to be considered for the bending of the beams?	(3M)
b)	A shaft is transmitting 97.5 kW at 180 rpm. If the allowable shear stress in the material is 60 MPa, Find the suitable diameter for the shaft. The shaft is not totwist more than 1 degree in a length of 3 meters. Assume C = 80 GPa.	(9M)
5.a)	Describe the applications of rope sheaves.	(3M)
b)	It is required to design a chain drive to connect a 5 kW, 1400 rpm electric motor to a drilling machine. The speed reduction is 3:1. The center distance should be approximately 500mm. (a) select a proper roller chain for the drive (b)Determine the pitch circle diameters of driving and driven sprockets (c) determine the number of chain links (d) specify the correct center distance between the axes of sprockets.	(9M)
6.a)	Why the selection of bearing is more important in helical gears?	(3M)
b)	Design a pair of spur gear with stub teeth to transmit 55kW from 175 mm pinion running at 2500 rpm to a gear running at 1500 rpm. Both the gears are made of steel having B.H.N 260. Approximate the pitch by means of Lewis equation and then adjust the dimensions to keep within the limits set by the dynamic load and wear equation.	(9M)
7.a)	What is differential screw?	(2M)
b)	In a machine tool application, the tool holder is pulled by means of an operating nut mounted on a screw. The tool holder travels at a speed of 5m/min. The screw has single start square threads of 48mm nominal diameter and 8mm pitch. The operating nut exerts a force of 500N to drive the tool holder. The mean radius of the friction collaris 40mm.The coefficient friction at thread collar surfaces is 0.15. Calculate (a) Power required driving the screw and (b) the efficiency of the mechanism.	(10M)

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Course Code: 18ME6T19

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
III- B.Tech II Semester Supplementary Examinations-April-2026(BR18)
ROBOTICS (Mechanical)

Time: 3 hours **Max. Marks: 60**

Question Paper consists of Part-A and Part-B
*Answer **ALL** the questions in **Part-A***
*Answer any **FOUR** Questions from **Part-B***

PART–A (6X2 = 12M)

1. a)	Explain resolution, accuracy & repeatability in the context of robots.	(2M)
b)	Explain about Industrial Robots Specifications	(2M)
c)	Differentiate forward and inverse kinematics of robots?	(2M)
d)	Differentiate between joint space and cartesian space trajectory planning.	(2M)
e)	Elaborate on servo system for robot control.	(2M)
f)	Explain about spray painting?	(2M)

PART–B (4X12 = 48M)

2.a)	Differentiate between Automation and Robotics, CAD/CAM and Robotics.	(6M)
b)	Explain the classification by coordinate system and control system.	(6M)
3.a)	Elaborate on the considerations in gripper selection and design.	(6M)
b)	Explain the working principle of magnetic grippers.	(6M)
4.a)	Derive the differential rotation matrix about a general axis q.	(6M)
b)	Prove that order of multiplication is not an issue with differential rotations.	(6M)
5.a)	Find the Manipulated Jacobian Matrix of Cylindrical Robot.	(6M)
b)	Differentiate between Lagrange Euler and Newton Euler Formulation.	(6M)
6.a)	Explain the components of a robot control system with a neat sketch.	(6M)
b)	Elaborate on the various Textual Programming Languages for robots.	(6M)
7.a)	What are proximity and range sensors? Explain the working principle of optical proximity sensor.	(6M)
b)	Explain Tactile Sensors & Force or Torque Sensors.	(6M)

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Course Code: **18CS6E09**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
III-B.Tech II -Semester Supplementary Examination (BR18), Regulations April-2026
PYTHON PROGRAMMING (Mechanical Engineering)

Time: 3 hours Max. Marks: 60

Question Paper consists of Part-A and Part-B
*Answer **ALL** the question in **Part-A***
*Answer any **FOUR** Questions from **Part-B***

PART–A (6X2 = 12M)

1. a)	Write in steps the setting path in windows?	(2M)
b)	Lis the Logical operators?	(2M)
c)	Define infinite loop with example?	(2M)
d)	Classify the number types in python?	(2M)
e)	What is Raising an Exception in python?	(2M)
f)	How to create an instance objects?	(2M)

PART–B (4X12 = 48M)

2.a)	Illustrate the Lines and indentation with Multi-line statements?	(6M)
b)	Elaborate the features of python?	(6M)
3.a)	Interpret the data type conversion and bit-wise operators with some examples?	(6M)
b)	Classify the identity operators and explain the operator precedence with an example?	(6M)
4.a)	Distinguish between while loop and infinite loop?	(6M)
b)	Write short notes on break statement, pass statement?	(6M)
5.a)	Define string and list the types of strings with examples?	(6M)
b)	Asses the argument of an expression and user define exception?	(6M)
6.a)	Analyse the function, Required, Keyword Arguments with illustrations?	(6M)
b)	Outline the calling a function with return statements?	(6M)
7.a)	Demonstrate the overview of OOP Terminology?	(6M)
b)	Discuss the built-in Class attributes and syntax for creating class?	(6M)

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Course Code: **18CS6T19**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
III- B. Tech II-Semester Supplementary Examinations (BR18), April-2026
Data Mining and Data Ware Housing (CSE)

Time: 3 hours | Max. Marks: 60

Question Paper consists of Part-A and Part-B
*Answer **ALL** the question in **Part-A***
*Answer any **FOUR** Questions from **Part-B***

PART–A (6X2 = 12M)

1. a)	What is Data Mining?	(2M)
b)	What is Pre-processing?	(2M)
c)	Define Data Warehouse?	(2M)
d)	Define Classification?	(2M)
e)	Define Association rule?	(2M)
f)	List out types of Clustering?	(2M)

PART–B (4X12 = 48M)

2.a)	Explain Data Mining Functionalities?	(6M)
b)	Explain Major Issues in Data Mining?	(6M)
3.a)	Discuss briefly various forms of Data-Preprocessing?	(6M)
b)	What are the typical methods for data discretization?	(6M)
4.a)	Discuss the OLAP operations in Multidimensional data modal?	(6M)
b)	Explain three types of schemas that are used for modeling data- warehouse with examples	(6M)
5.a)	Define information gain and explain its importance in decision tree induction?	(6M)
b)	With example explain Bayesian belief network?	(6M)
6.a)	Explain Frequent Item set generation with an example?	(6M)
b)	Explain Apriori algorithm with suitable illustration?	(6M)
7.a)	Explain K-means Algorithm with example?	(6M)
b)	Briefly describe about Hierarchical Clustering?	(6M)

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BONAMVENKATACHALAMAYYAENGINEERINGCOLLEGE::ODALAREVU

(AU'TONOMOUS)

III-B.Tech II-Semester Supplementary Examinations(BR18), April-2026

DESIGN AND ANALYSIS OF ALGORITHMS (CSE)

Time: 3 hours | Max.Marks:60

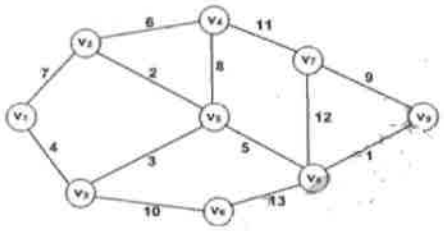
Question Paper consists of Part-A and Part-B
Answer ALL the questions in Part-A
Answer any FOUR Questions from Part-B

PART—A(6X2=12M)

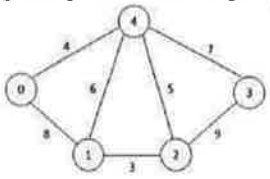
1	a)	Define Space and Time Complexity.	(2M)
	b)	Write the recurrence relation for divide and conquer problem.	(2M)
	c)	Define Back tracking	(2M)
	d)	List the features of dynamic programming.	(2M)
	e)	Define chromatic number.	(2M)
	f)	Define branch and bound algorithm.	(2M)

PART—B(4X12=48M)

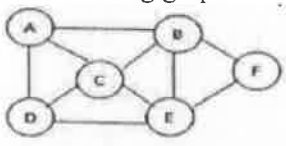
2	a)	What is asymptotic notation? Elaborate on asymptotic notations with examples.	(6M)
	b)	What is an algorithm? Describe the criteria that an algorithm must satisfy.	(6M)
3	a)	Write Divide and Conquer recursive Merge sort algorithm and derive the time complexity of this algorithm.	(6M)
	b)	Consider the array of elements and search the element 55 using binary search 25,35,45,55,65,66,67,75,76,77,78,86,87. Derive the time complexity of binary search.	(6M)
4	a)	Statethegreedyknapsack?Findanoptimalsolutiontotheknapsackinstancen=3,m=20 , (P1,P2,P3)=(25,24,15) and(W1,W2,W3)—(18,15,10).	(6M)
	b)	Write an algorithm for prim's method and find the minimum cost spanning tree for the following graph	(6M)



5	a)	Calculate shortest distances using All pairs shortest path algorithm	(6M)



	b)	Construct optimal schedule for the following jobs n=8, (p1,p2,p3,p4,p5,p6,p7,p8)=(40,100,50,30,4,7,12,11) and (d1,d2,d3,d4,d5,d6,d7,d8)=(1,4,2,3,3,2,2,1)	(6M)
6	a)	Find the Hamiltonian cycle in the following graph	(6M)



	b)	Use Backtracking technique, solve the following instance for the Subset sum problem, s=(6,5,3,7) and d=15.	(6M)
7	a)	DrawtheportionofthestatespacetreegeneratedbyFIFOBBfortheknapsack instance:n—5,(p1,p2,...,p5)=(10,15,6,8,4),(w1,w2,...,w5)=(4,6,3,4,2),and m=12	(6M)
	b)	Differentiate between FIFO branch and bound and LC branch and bound.	(6M)

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Course Code: 18CS6T20

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)
III-B.Tech II -Semester Supplementary Examinations (BR18), April- 2026
COMPUTER NETWORKS (CSE)

Time: 3 hours **Max. Marks: 60**

Question Paper consists of Part-A and Part-B
*Answer **ALL** the question in **Part-A***
*Answer any **FOUR** Questions from **Part-B***

PART–A (6X2 = 12M)

1.	a)	Group the OSI layers by function.	(2M)
	b)	Define Time Division Multiplexing.	(2M)
	c)	What are the responsibilities of data link layer?	(2M)
	d)	Explain shortest path routing algorithm.	(2M)
	e)	Define fast Ethernet.	(2M)
	f)	What are the basic functions of email?	(2M)

PART–B (4X12 = 48M)

2.	a)	Discuss various types of networks topologies in computer network.	(6M)
	b)	With a neat diagram describe in detail about the Network architecture.	(6M)
3.	a)	Explain Frequency Division Multiplexing with neat diagram.	(6M)
	b)	Explain digital modulation techniques with neat waveforms.	(6M)
4.	a)	Explain about the Carrier Sense Multiple Access Protocols.	(6M)
	b)	Describe sliding window protocol using Go back n.	(6M)
5.	a)	State the major difference between distance vector routing and link state routing.	(6M)
	b)	Explain in detail congestion control algorithms.	(6M)
6.	a)	Explain MAC sub layer protocol and frame structure of IEEE 802.11.	(6M)
	b)	Describe addressing mechanism in standard Ethernet.	(6M)
7.	a)	Describe the role of a DNS on a computer network with reference to its components.	(6M)
	b)	Write briefly about World wide web.	(6M)

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