Course Code: **20CE6T09**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)

III-B.Tech. II-Semester Regular/Supplementary Examinations (BR20), April 2025

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

Note: (IS 800:2007 & Steel table are to be provided to the student in the Examination hall)

	PART-A	
1.	Design a simply supported plate girder of span 20 m to support a Dead Load and Live load of 70 kN/m. Design bearing stiffeners and intermediate stiffeners also.	[28M]
	(OR)	
2.	Design a gantry girder, without lateral restraint along its span, to be used in an industrial building carrying an overhead traveling crane for the following data Span of the gantry girder =7.5 m Crane capacity = 200 kN Self weight of crane girder excluding trolley = 200 kN Self weight of trolley, electrical motor, hook, etc = 40 kN Minimum hook approach = 1.2 m Distance between wheel centres = 3.5 m Span of the crane = 15 m Self weight of the rail section = 300 N/m Yield stress of steel = 250 MPa.	[28M]
	PART-B	
3.a)	List the advantages and disadvantages of welded connections.	[7M]
3.b)	Design a simply supported beam of span 5m carrying a reinforced concrete slab capable of providing the laterally restrainment to top of compression flange. The DL is 10 kN/m and imposed load is 20 kN/m. Assume Fe410 grade steel.	[7M]
4.	Find a suitable a double angle tension member connected to each side of a 10 mm thick gusset plate to carry an axial factored load of 375 kN. The length of the member is 3 m. The pair of angles are connected to each side of the gusset plate.	[14M]
5.	Design a compound column to carry an axial load of 1000 kN. The column consists of two channels placed back to back and laced together. The effective length of the column is 5m.	[14M]
6.	Design intermediate transverse stiffeners for the welded plate girder section as follows; Web plate = 3000 mm × 8 mm; Flange plates = 500 mm × 20 mm; Factored bending moment and shear force are 4500 kN-m and 900 kN respectively.	[14M]
7.	Determine the moments and forces due to vertical and horizontal loads acting on a simply supported gantry girder given the following data Simply supported span = 6m Cranes wheel centres = 3.6m Self weight of the girder = 1.6 kN/m Maximum crane wheel load = 220kN Weight of trolley = 60 kN Maximum hook load = 200 kN	[14M]

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Course Code: **20CE6T10**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)

III-B. Tech II-Semester Regular/Supplementary Examinations (BR20), APRIL-2025

WATER RESOURCES ENGINEERING (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 various methods of determination of average rainfall over a basin.	(7M)
1.b)	Explain Intensity-Duration-Frequency curves and Depth area duration curves.	(7M)
	(OR)	
1.c)	Describe briefly types of rain gauges for measurement of rainfall with neat sketches.	(7M)
1.d)	The average annual rainfalls of 5 rain gauges in a basin are 89,54,45,41 and 55 cm. If the error in the estimation of basin mean rainfall should not exceed 10%, how many additional gauges should be installed in the basin?	(7M)
	UNIT-II	
2.a)	Explain any three methods of estimating the evapotranspiration.	(7M)
2.b)	Explain the double ring infiltrometer with adjustable depth of flooding with the help of a neat sketch.	(7M)
	(OR)	
2.c)	Describe how the evaporation is measured using atmometers. Also explain various methods of reducing the evaporation from a water body.	(7M)
2.d)	Discuss various factors affecting the evapotranspiration.	(7M)
	UNIT-III	
3.a)	Explain any two methods of estimating runoff.	(7M)
3.b)	Given below are the ordinates of a 4-hour unit hydrograph of a basin in m^3/s at one-hour intervals. 4, 25, 44, 60, 70, 61, 52, 45, 38, 32, 27, 22, 18, 14, 11, 8, 6, 4, 2 and 1. Derive 2-hour unit hydrograph.	(7M)
	(OR)	
3.c)	List out various physiographic factors which affect runoff. Discuss their influence on the volume of runoff and on the time distribution of runoff.	(7M)
3.d)	Given below are the observed flows (cumecs) from a storm of 6-hour duration on a stream with a drainage area of 316 km^2. Assume a constant base flow of 17 cumecs. Derive a 6-hour duration unit hydrograph.	(7M)

Time (hr)	0	12	24	36	48	60	72
Flow	17	254.5	150	87.7	53.8	31.1	17

	UNIT-IV	
4.a)	Explain the Gumbel's method of estimation of T-year flood.	(7M)
4.b)	Explain the method of determining the Muskingum parameters K and x of a reach from a pair of observed inflow and outflow hydrographs.	(7M)
	(OR)	
4.c)	Describe the method of estimating floods using Log-Pearson type-III distribution.	(7M)
4.d)	Derive the Muskingum routing equation and the expressions for the routing coefficients C0, C1 and C2.	(7M)

	UNIT-V	
5.a)	Derive an expression for the steady state discharge of a well fully penetrating into a confined aquifer. List out the assumptions made.	(7M)
5.b)	During the recuperation test conducted on an open well in a region, the water level in the well was depressed by 3 m and it was observed to rise by 1.75 m in 75 minutes. What is the specific yield from wells in that region? What could be the yield from a well of 5 m diameter under a depression head of 2.5 m? What should be the diameter of the well to give a yield of 12 lit/s under a depression head of 2 m?	(7M)
	(OR)	
5.c)	Explain the terms (i) Cone of depression (ii) Specific yield (iii) Flowing well (iv) Darcy's velocity.	(7M)
5.d)	In a water table aquifer of 50 m thickness, a 20 cm diameter well is pumped at a uniform rate of 0.05 m3 /s. If the steady state drawdown measured in the observation wells located at 10 m and 100 m distances from the well are 6.5and 0.25 m respectively, determine the hydraulic conductivity of the aquifer.	(7M)

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Course Code: **20CE6T11**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)

III -B. Tech II-Semester Regular/Supplementary Examinations (BR20), APRIL-2025

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)	Explain the need for soil exploration and also the methods of sub-soil exploration.	(7M)
1.b)	Explain various boring methods with their suitability and neat sketches.	(7M)
	(OR)	
1.c)	Discuss Standard Penetration Test with the necessary corrections.	(7M)
1.d)	The field 'N' value in a deposit of fully submerged fine sand was 50 at a depth of 8 m. The average saturated unit weight of soil is 19 kN/m^3. Find the corrected 'N' value.	(7M)
	UNIT-II	
2.a)	How a slope is analysed using Swedish circle method? Derive an expression for the factor of safety.	(7M)
2.b)	An embankment is inclined at an angle of 35° and its height is 15 m. The angle of shearing resistance is 15° and the cohesion intercept is 200kN/m^2. The unit weight of soil is 18.0kN/m^3. If Taylor's stability number is 0.06, find the factor of Safety with respect to cohesion.	(7M)
	(OR)	
2.c)	Explain Bishop's simplified method. Derive an expression for the factor of safety.	(7M)
2.d)	Determine the factor of safety for a long natural slope in an over consolidated clay inclined at 10^0 to the horizontal with the water table at the surface and the seepage is parallel to the slope. The plane slip has developed at a depth of 5m below the surface.	(7M)
	UNIT-III	
3.a)	Explain the Terzaghi's method of determining safe bearing capacity.	(7M)
3.b)	Discuss types of retaining walls with neat sketch.	(7M)
	(OR)	
3.c)	Discuss the various factors that affect the bearing capacity of a shallow footing. How do you ascertain whether a foundation soil is likely to fail in local shear or in General shear?	(7M)
3.d)	Explain the different types of settlement of soil.	(7M)
	UNIT-IV	
4.a)	Classify the pile foundations along with their suitability.	(7M)
4.b)	A plate bearing test was conducted in a pure cohesive soil with 30 cm square plate. At a depth of1.5 m below the ground level. The water table was found to be at 6 m Depth. Failure occurred at a load of 50 kN. Find the factor of safety if a 1.2 m wide wall footing carriers 140 kN/m run and the foundation is at a depth of 2 m Below ground level.	(7M)
	(OR)	
4.c)	What is the necessity of pile foundation? Discuss various installation methods of pile foundation.	(7M)

4.d)	Discuss the Load carrying capacity of piles based on static pile formulae?	(7M)
	UNIT-V	
5.a)	Discuss the construction aspects of Well Foundations. What are 'Tilts and Shifts'? What are the remedial measures to control these?	(7M)
5.b)	Explain the different shapes of Cross-sections of well foundations with neat sketches. Discuss the merits and demerits of each.	(7M)
	(OR)	
5.c)	Outline the components of well foundation with a neat sketch.	(7M)
5.d)	What are the forces acting in well foundation? And explain in details.	(7M)

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Course Code: **20CE6D06**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)

III-B.Tech II-Semester Regular/Supplementary Examinations (BR20), April-2025

RAILWAYS, AIRPORTS, DOCKS AND HARBOURS (CE)

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)	Draw a neat sketch of the permanent way and explain the function of the components.	(7M)
b)	Explain negative super elevation with a neat sketch and explain cant deficiency.	(7M)
	(OR)	
1.c)	What is creep? Explain creep using percussion theory.	(7M)
d)	Calculate the maximum speed of the train on a B.G. having a curvature of 5° and a cant of 80 mm.	(7M)
	UNIT-II	
2.a)	What is a turnout? Explain the Right-hand turn out with a neat sketch.	(7M)
b)	Explain the diamond and scissor crossing with a neat sketch.	(7M)
	(OR)	
2.c)	Explain the types of signaling systems.	(7M)
d)	Draw a sketch of the left-hand turn out and show various components.	(7M)
	UNIT-III	
3.a)	Explain about the airport master plan with various components.	(7M)
3.b)	Explain the concept of zoning laws and write their limitations.	(7M)
	(OR)	
3c)	Explain about the factors to be considered for selecting a site for an airport.	(7M)
d)	Explain the taxiway design and its importance.	(7M)
	UNIT-IV	
4.a)	Explain the design methods for flexible pavements of a runway.	(7M)
b)	The length of a runway under standard conditions is 1800 m. The airport site has an elevation of 280 m. Its reference temperature is 34.960 C. If the runway is to be constructed with an effective gradient of 0.20%, determine the corrected runway length.	(7M)
	(OR)	
4.c)	Explain the design of surface and subsurface drainage for airport runway.	(7M)
d)	Explain LCN system of Pavement Design of runway.	(7M)
	UNIT-V	
5.a)	What is quay wall and explain its construction procedure?	(7M)
b)	Explain the classification and requirements of a good port.	(7M)
	(OR)	
5.c)	What is dredging and explain about maintenance of ports?	(7M)
d)	Explain classification of ports and harbour.	(7M)

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Course Code: 20CE6E02

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)

III -B. Tech II-Semester Regular/Supplementary Examinations (BR20), APRIL-2025

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)	What are Green Buildings? Explain the principle involved in the Design.	(7M)
1.b)	What are the negative impacts of conventional building materials? Explain.	(7M)
	(OR)	
1.c)	Define the term Sustainability. How it is important to have sustainable building technologies?	(7M)
1.d)	State the advantages of Green Buildings.	(7M)
	UNIT-II	
2.a)	Distinguish between active and passive techniques of energy management in Buildings.	(7M)
2.b)	Explain the role of Building Units in Energy consumption. Suggest alternate materials to mitigate the energy issues.	(7M)
	(OR)	
2.c)	Write a note on alternative technologies to reduce carbon emission levels in Building Construction.	(7M)
2.d)	Explain the Water Recycling methods to achieve Water efficiency.	(7M)
	UNIT-III	
3.a)	Explain the steps to be taken to reduce the Energy Demand in Green Buildings.	(7M)
3.b)	What are the onsite sources and sinks in Green Buildings? Explain.	(7M)
	(OR)	
3.c)	Explain the role of renewable energy sources for Green Buildings.	(7M)
3.d)	Explain eco-friendly captive power generation techniques in Green Buildings.	(7M)
	UNIT-IV	
4.a)	What role do building envelope design and insulation play in reducing the energy load on HVAC systems in green buildings?	(7M)
4.b)	How can renewable energy sources, such as solar thermal and photovoltaic systems, be integrated into HVAC systems in green buildings.	(7M)
	(OR)	
4.c)	What are the best practices for maintaining and servicing HVAC systems in green buildings to ensure their continued energy efficiency?	(7M)
4.d)	What are the factors to be considered for selection of Air Handling Units in Green Buildings?	(7M)
	UNIT-V	
5.a)	What is Sick Building Syndrome? Suggest suitable solutions for the same.	(7M)
5.b)	Explain the measures to be taken to ensure acceptable indoor air quality.	(7M)
	(OR)	
5.c)	Write a note on Rapidly renewable materials. How these can contribute to Green Buildings.	(7M)
5.d)	Explain the challenges to establish Indoor Environmental Quality.	(7M)

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BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
III -B.Tech II-Semester Regular/Supplementary Examinations (BR20), APRIL-2025

POWER ELECTRONIC CONTROLLERS & 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 about various parts in electric drives.	(7M)
1.b)	Explain the Nature and classification of Load torques.	(7M)
	(OR)	
1.c)	Explain what do you understand by steady state stability? Explain the steady state stability of a drive system on relative characteristics of the motor and load.	(7M)
1.d)	Discuss the different braking methods employed for electrical motors.	(7M)
	UNIT-II	
2.a)	Explain the operation of a separately excited dc motor using single phase fully controlled rectifier.	(7M)
2.b)	A 230 V, 960 rpm, 20 A separately excited dc motor has an armature resistance of 1.2 Ω and inductance of 50 mH. Motor is controlled by a single-phase half controlled rectifier with source voltage of 230 V and 50 Hz. (i) Calculate the firing angle for half rated motor torque and 800 rpm (ii) Calculate the firing angle for rated motor torque and 500 rpm	(7M)
	(OR)	
2.c)	Describe the use of 1-Phase full converter for the speed control of a dc series motor with appropriate waveforms also derive the average value of output voltage and draw the torque - speed characteristics	(7M)
2.d)	Explain the working principle of a dual converter fed DC motor.	(7M)
	UNIT-III	
3.a)	Explain class-A chopper fed armature speed control of separately excited dc motor. Derive the motor speed-torque relation and explain its characteristics	(7M)
3.b)	Explain the operation of four quadrant chopper fed to the DC series motor and draw the current and voltage waveforms for continuous current operation.	(7M)
	(OR)	
3.c)	Explain the operation of two quadrant chopper drive with necessary equivalent circuits and waveforms.	(7M)
3.d)	Explain closed loop operation of a dc-dc converter fed dc motor drive.	(7M)
	UNIT-IV	
4.a)	Briefly explain the principle of Variable frequency (v/f) control of Induction motor.	(7M)
4.b)	What are the different methods of speed control of induction motors? Explain the operation of 3-phase induction motor drive with PWM Voltage Source Inverter.	(7M)
	(OR)	
4.c)	Briefly explain the power factor control of synchronous motor with neat sketch	(7M)
4.d)	Draw the block diagram of a closed loop synchronous motor drive fed from VSI and explain.	(7M)

	UNIT-V	
5.a)	Explain static Rotor resistance control of 3-phase Slip ring induction motor with neat diagram and equations.	(7M)
5.b)	A three phase, 50 Hz, Y-connected, 440 V, induction motor rotates at 2800 rpm at full load. The motor is driven by slip-energy recovery system. Calculate the triggering angle for a motor speed of 2100 rpm, assume turns ratio is equal to one.	(7M)
	(OR)	
5.c)	Draw the circuit diagram and explain the working of Static Kramer drive for speed control of a three phase induction motor.	(7M)
5.d)	Explain the operation of three phase slip ring induction motor drive when static Scherbius scheme is employed.	(7M)

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BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)

III -B.Tech II-Semester Regular/Supplementary Examinations (BR20), April-2025

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) How the buses are classified in load flow analysis? Write the need for Slack bus in load flow analysis. (7M)

1.b) With a neat flow chart, explain the computational procedure for load flow solution using the Gauss-Seidel load flow solution. (7M)

(OR)

1.c) Why the load flow studies are important for planning the existing system as well as the future expansion? Why is generator bus called as voltage controlled bus? (7M)

1.d) With a neat flow chart, explain the computational procedure for load flow solution using Newton-Raphson iterative method when the system contains all types of buses. (7M)

UNIT-II

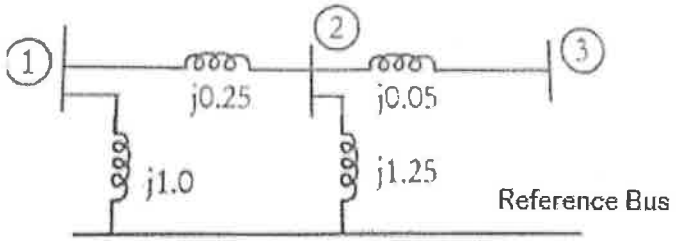
2.a) Determine the Z_{Bus} for a power system whose element data is given in the following table (7M)

Bus code p-q	Impedance Z_{pq}	Bus code
1-2	0.06+j0.18	1
1-3	0.02+j0.06	2
2-3	0.04+j0.12	3

2.b) Modify the Expression for Z_{BUS} when addition of element from new bus to reference bus. (7M)

(OR)

2.c) Determine Z_{BUS} for the system whose reactance diagram is shown in below fig. All the impedances are in p.u. (7M)



2.d) Modify the expression for Z_{BUS} when addition of element between two old buses. (7M)

UNIT-III

3.a) Explain the differences between the per unit representations of single phase and three phase systems by deriving necessary equations. (7M)

3.b) Derive the expression for the short circuit current during the transients in the power system. (7M)

(OR)

3.c) Show that for a two winding transformer, the p.u value of impedance is same when referred to either side of the transformer. (7M)

3.d) Two generators are connected in parallel to the LV side of a three phase Δ-Y transformer. Generator1 is rated 60MVA, 11 KV, Generator 2 is rated 30 MVA, 11 kV with same sub-transient reactance of 25%. The transformer is rated 90 MVA at 11 Δ / 132Y kV with reactance of 10%. Determine the sub-transient current in each generator when a three phase short circuit occurs on the HV side of the transformer. (7M)

UNIT-IV

4.a) A 25 MVA, 13.2 kV alternator with solidly grounded neutral has a sub-transient reactance of 0.25 p.u. The negative and zero sequence reactance's are 0.35 and 0.1 p.u. respectively. A single line to ground fault occurs at the terminals of an unloaded alternator; determine the fault current and the line-to-line voltages. Neglect resistance. (7M)

4.b) What are the different unsymmetrical faults and compare their characteristics. (7M)

(OR)

4.c) Draw and explain the positive, negative, zero sequence impedance diagrams for different 3-phase transformer winding connections. (7M)

4.d) Derive the expression for fault current in line to line fault on unloaded generator. Draw an equivalent network showing the interconnection of networks of line to line fault. (7M)

UNIT-V

5.a) Derive the expression for the maximum power transfer from the steady state power. (7M)

5.b) A 4 pole, 50 Hz, 60 MVA turbo generator has a moment of inertia of 9x103 kg-m^2. Find the kinetic energy in MJ at rated speed, the inertia constant M and H, the acceleration in degrees per sec^2 and in rpm/sec. If the input power is 20 MW and the output power is 14 MW. (7M)

(OR)

5.c) Explain the equal area criterion with respective to transient stability? (7M)

5.d) Draw and explain power angle curve of a synchronous machine. (7M)

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Course Code: 20EC6113

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)

III -B. Tech II-Semester Regular/Supplementary Examinations (BR20), APRIL-2025

MICROPROCESSOR & MICROCONTROLLERS (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)	Explain briefly the following (i) General Purpose Registers (ii) Segment Registers (iii) Index and pointer registers	(7M)
1.b)	What is memory Segmentation? List the advantages of memory segmentation.	(7M)
	(OR)	
1.c)	List various addressing modes and explain them with neat examples.	(8M)
1.d)	Draw the interrupt cycle of 8086 microprocessor and explain its operation in detail.	(6M)
	UNIT-II	
2.a)	What is Maximum mode? Draw the Maximum mode pin diagram of 8086 and explain each pin in detail.	(7M)
2.b)	Generate timing diagram for Memory Read operation of 8086 in Maximum mode configuration and explain it briefly.	(7M)
	(OR)	
2.c)	Write an 8086 assembly language program to arrange the given hexadecimal bytes in Descending order.	(8M)
2.d)	Explain briefly the following assembler directive with necessary examples (i) DW (ii) DD (iii) LENGTH (iv) EQUATE	(6M)
	UNIT-III	
3.a)	Draw the interfacing diagram of D/A converter with 8086 microprocessor along with 8255 PPI and explain its operation.	(7M)
3.b)	Explain need of DMA. Discuss in detail about DMA data transfer mode.	(7M)
	(OR)	
3.c)	Draw the block diagram of 8255 PPI and explain each block briefly.	(7M)
3.d)	Explain the operational modes (i) BSR mode & (ii) I/O mode of 8255 PPI with their control register formats.	(7M)
	UNIT-IV	
4.a)	Explain the register set organization of 8051 Microcontroller.	(7M)
4.b)	Outline the I/O ports of 8051 microcontroller in detail.	(7M)
	(OR)	
4.c)	Explain various modes of operation of timer / counters in 8051 Microcontroller.	(7M)
4.d)	Examine the internal memory organization of the 8051 microcontroller and analyze how different memory sections contribute to its functionality.	(7M)
	UNIT-V	
5.a)	Draw and explain different timers present in the PIC controller.	(7M)
5.b)	Describe the I/O ports in the PIC16F877. How can they be configured as input or output using TRIS registers?	(7M)
	(OR)	
5.c)	Write a short note on PIC 16F8XX Characteristics.	(7M)
5.d)	Explain about the interrupts in PIC 16F877.	(7M)

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Course Code: 20EE6D08

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE: ODALAREVU
(AUTONOMOUS)

III-B.Tech II-Semester Regular/Supplementary Examinations (BR20),April-2025

Power System Operation & Control (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) Explain the need of economical load dispatch for a given power system. (7M)

1.b) In a thermal power station, incremental costs are given by the following equations: (7M)
$C_1 = (0.03P_1^2 + 21P_1 + 750) Rs/hour; C_2 = (0.5P_2^2 + 18P_2 + 980) Rs/hour$. Where P_1 and P_2 are the loads in MW. Determine the economical load allocation between the two units, when the total load on the station is 300 MW.

(OR)

1.c) Derive the transmission loss formula for a system consisting of n-generating plants supplying several loads inter connected through a transmission networks. State any assumptions are made. (14M)

UNIT-II

2.a) Explain the problem of scheduling hydrothermal power plants. Explain the constraints in the problem. (7M)

2.b) Derive mathematical formulation for short term hydro thermal scheduling. (7M)

(OR)

2.c) Obtain the condition for economic generation of steam and hydro plants for short term scheduling. State the any assumptions are considered. (14M)

UNIT-III

3.a) Explain the solution technology for solving priority list method. (7M)

3.b) What is meant by unit commitment problem? Explain the need for unit commitment problem in operation of power system. (7M)

(OR)

3.c) Explain with a neat flowchart the procedure for finding the solution for unit commitment Problems using forward dynamic programming method. (14M)

UNIT-IV

4.a) Derive the transfer function of an controlled load frequency control of a single area system and derive the expression for static error following a step load change. (14M)

(OR)

4.c) What are the basic requirements needed for control strategy in LFC system. (7M)

4.d) Obtain the mathematical modelling of tie line power in an inter connected system and its block diagram. (7M)

UNIT-V

5.a) Obtain the dynamic response of load frequency controller with integral control action in single area load frequency control system. (7M)

5.b) Distinguish between load frequency control and economic dispatch control. (7M)

(OR)

5.c) Explain the combined operation of load frequency control and economic load dispatch control with neat diagram. (14M)

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Course Code: **20EE6E02**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)

III -B. Tech II-Semester Regular/Supplementary Examinations (BR20), APRIL-2025

ARTIFICAL NEUTRAL NETWORKS AND FUZZY LOGIC (EEE & 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)	Compare the Human brain and artificial intelligence.	(7M)
1.b)	Explain the architecture of artificial neuron model.	(7M)
	(OR)	
1.c)	Explain any two AI techniques in detail.	(7M)
1.d)	Classify the learning methods. Give a brief explanation about each.	(7M)
	UNIT-II	
2.a)	Explain the artificial neuron model with a neat diagram.	(7M)
2.b)	Write the Single-layer feed-forward perceptron algorithm.	(7M)
	(OR)	
2.c)	What is the role of activation functions in ANN model? Explain.	(7M)
2.d)	Explain different learning rules followed by Neural networks.	(7M)
	UNIT-III	
3.a)	Explain the back propagation learning algorithm.	(9M)
3.b)	Explain the architecture and the training algorithm of generalized radial basis networks.	(5M)
	(OR)	
3.c)	Write short notes on "supervised" and "unsupervised" learning.	(7M)
3.d)	Explain Hopfield network made up of 5 neurons, which is required to store the fundamental memories.	(7M)
	UNIT-IV	
4.a)	Distinguish the crisp and fuzzy sets with suitable examples.	(7M)
4.b)	Explain the properties of commutativity, associativity, distrubutivity and identity with respect to crisp sets and fuzzy sets.	(7M)
	(OR)	
4.c)	For the fuzzy set and defined by $\tilde{A}=\{(x_1, 0.3), (x_2, 0.7), (x_3, 0.2)\}$ & $\tilde{B}=\{(x_1, 0.4), (x_2, 0.8), (x_3, 0.9)\}$ Find (i) $\tilde{A} \cup \tilde{B}$ (ii) $\tilde{A} - \tilde{B}$ (iii) Verify De morgan's law $(\tilde{A} \cap \tilde{B})^c = \tilde{A}^c \cup \tilde{B}^c$	(7M)
4.d)	What is the role of membership function in fuzzy logic? Mention various membership functions.	(7M)
	UNIT-V	
5.a)	Explain min-max method of implication with a suitable example.	(5M)
5.b)	Write short notes on fuzzification and knowledge base by using fuzzy logic controller block diagram.	(9M)
	(OR)	
5.c)	Compare fuzzification with defuzzification. Explain the types of Defuzzification methods.	(7M)
5.d)	Explain with a suitable example the Rule based Fuzzy system	(7M)

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BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)

III-B.Tech II-Semester Regular/Supplementary Examinations (BR20), April- 2025

DYNAMICS OF MACHINERY (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

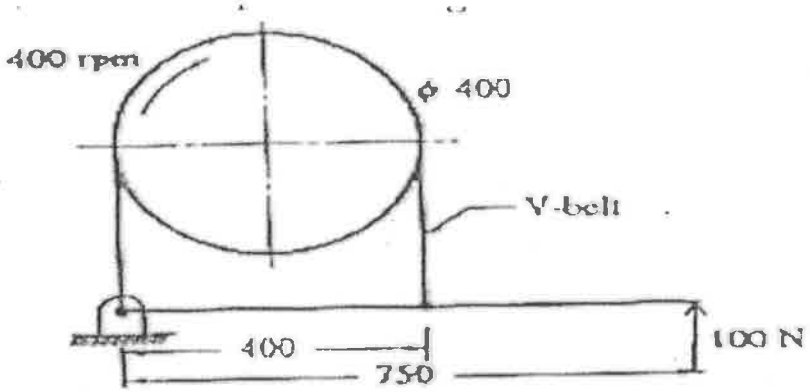
UNIT-I

1.a) With a neat sketch, explain the rope brake dynamometer's operation method. (7M)

1.b) Explain the uniform pressure theory for a single plate clutch. (7M)

(OR)

1.c) A band brake shown in Fig. uses a V-belt. The pitch diameter of the V-grooved pulley is 400mm. The groove angle is 45° and the coefficient of friction is 0.3. Determine the power rating. (7M)



1.d) A multiple-disc clutch has five plates having four pairs of active friction surfaces. If the intensity of pressure is not to exceed 0.127 N/mm^2, find the power transmitted at 500 r.p.m. The outer and inner radii of friction surfaces are 125 mm and 75 mm respectively. Assume uniform wear and take coefficient of friction = 0.3. (7M)

UNIT-II

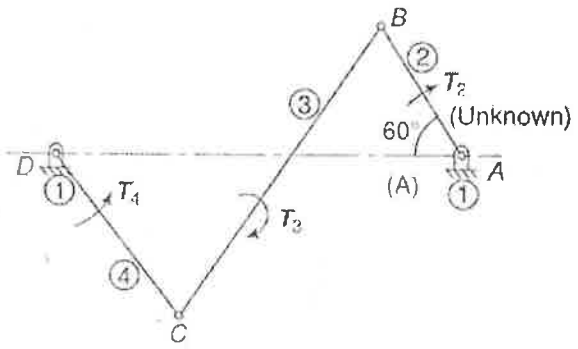
2.a) Discuss the dynamic force analysis of the slider crank mechanism. (7M)

2.b) Explain the function of a flywheel from a crank effort diagram. (7M)

(OR)

2.c) Derive the expression for the angular velocity and angular acceleration of a connecting rod. (7M)

2.d) In a four-bar mechanism as shown in Fig., torque T_3 and T_4 have magnitudes of 30 N.m and 20 N.m, respectively. The link lengths are AD = 800 mm, AB = 300 mm, BC = 700 mm and CD = 400 mm. For the static equilibrium of the mechanism, determine the required input torque T_2. (7M)



UNIT-III

3.a) What is the effect of the gyroscopic couple on the pitching and rolling of ship? (7M)

3.b) Calculate the range of speed of a porter governor that has equal arms of each 200mm long and pivoted on the axis of rotation. The mass of each ball is 4kg and the central load of the sleeve is 20kg. The radius of rotation of the ball is 100mm when the governor begins to lift and 130mm when the governor is at maximum speed. (7M)

(OR)

3.c) The turbine rotor of a ship has a mass of 3500 kg. It has a radius of gyration of 0.45 m and a speed of 3000 rpm clockwise when looking from the stern. Determine the gyroscopic couple and its effect upon the ship. When the ship is steering to the left on a curve of 100 m radius at a speed of 36 km/h. (7M)

3.d) Derive an expression for the stiffness of the spring used in the Hartnell governor with the help of neat sketches. (7M)

UNIT-IV

4.a) What are the reasons for the partial balancing of reciprocating masses? Explain. (7M)

4.b) The cranks of a three-cylinder locomotive are set at 120^0. The stroke is 100 mm, the length of the connecting rod is 200 mm, the mass of the reciprocating parts per cylinder is 1.5 kg and the speed of the crankshaft is 1500 rpm. Determine the magnitude of primary and secondary balancing. (7M)

(OR)

4.c) Four masses A, B, C and D revolve at equal radii and are equally spaced along the shaft. The mass B is 6 kg and radii of masses C and D make 90^0 and 240^0 with respect to mass B. Determine the magnitude of the masses A, C and D and the angular position mass A so that the system may be completely balanced. (7M)

4.d) Define (i) Variation of tractive force, (ii) Swaying couple (iii) Hammer blow. (7M)

UNIT-V

5.a) Derive an expression for the natural frequency of free torsional vibrations. (7M)

5.b) With neat sketches, explain the different types of vibrations. (7M)

(OR)

5.c) Derive an expression for the natural frequency of the free longitudinal vibration by (i)Equilibrium method (ii) Energy method. (7M)

5.d) What do you mean by the whirling of shafts? What is critical speed? Explain with neat sketch. (7M)

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Course Code: 20ME6T10

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)

III -B.Tech II Semester Regular/Supplementary Examinations (BR20), APRIL-2025

HEAT TRANSFER (MECHANICAL ENGINEERING)

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)	Derive general heat conduction equation in Cartesian coordinates.	(8M)
1.b)	Explain the modes of Heat transfer.	(6M)
	(OR)	
1.c)	Derive an expression for general three dimensional heat conduction equations for general three dimensional heat conduction equation in cylindrical coordinate.	(7M)
1.d)	A wall of 0.5 m thickness is constructed using a material having k= 1.4 W/mK. The wall is insulated with a material having k of 0.35 W/mK so that heat loss per m^2 is 1500W. The inner and outer temperatures are 1273K and 373 K respectively. Calculate the thickness of insulation required and temperature of at the interface between the two layers.	(7M)
	UNIT-II	
2.a)	Derive an expression for the temperature distribution and rate of heat transfer from a fin of uniform Cross section. Neglect the heat transfer from the fin.	(7M)
2.b)	A hot cylinder ingot of 50mm and 200mm long is taken out from the furnace at 800°C and dipped in water till its temperature falls to 500°C. Then it is directly exposed to air till its temperature falls to 100°C. Find the total time required for the ingot to reach the temperature from 800°C to 100°C. Take the following for ingot: k = 60W/m-°C, C = 200J/m-°C, ρ = 800kg/m^3, heat transfer coefficient in water = 200W/m^2-°C, heat transfer coefficient in air = 20W/m^2-°C, Temperature of air or water = 30°C.	(7M)
	(OR)	
2.c)	A motor body is 360 mm in diameter (outside) and 240 mm long. Its surface temperature should not exceed 55°C when dissipating 340W. Longitudinal fins of 15 mm thickness and 40 mm height are proposed. The convection coefficient is 40W/m^2°C. Determine the number of fins required. Atmospheric temperature is 30°C. Thermal conductivity = 40 W/m°C.	(4M)
2.d)	Derive an expression for instantaneous temperature and heat transfer rate for a body subjected to heating or cooling in terms of Biot and Fourier number.	(10M)
	UNIT-III	
3.a)	Air at 25°C flows over 1 m x 3 m (3 m long) horizontal plate maintained at 200°C at 10 *mls.* Calculate the average heat transfer coefficients for both laminar and turbulent regions. Take Re (critical) = 3.5 x 10^5 .	(7M)
3.b)	By dimensional analysis show that for forced convection heat transfer, Nusselt number can be expressed as a function of Prandtl number and Reynolds number.	(7M)

3.c)	Distinguish between free and forced convection giving examples.	(7M)
3.d)	The surface temperature of a steel wall (k = 0.213 W/mK) 0.3 m thick are maintained at 100°C and 40°C . Water at a temperature of T∞= 20°C flows over the surface at 40°C.Calculate the convection coefficient associated with the water flow.	(7M)
	UNIT-IV	
4.a)	Explain the development of hydrodynamic and thermal boundary layers with suitable figure.	(7M)
4.b)	In a Double pipe counter flow heat exchanger 10000 kg/h of an oil having a specific heat of 2095 J/kgK is cooled from 80°C to 50°C by 8000 kg/h of water entering at 25°C. Determine the heat exchanger area for an overall heat transfer coefficient of 300 W/m^2K. Take Cp for water as 4180 J/kgK .	(7M)
	(OR)	
4.c)	Derive LMTD formula for a parallel flow heat exchanger.	(7M)
4.d)	The flow rates of hot and cold water streams running through a parallel flow heat exchanger are 0.2 kg/s and 0.5 kg/s respectively. The inlet temperatures on the hot and cold sides are 75^0C and 20^0C respectively. The exit temperature of hot water is 45^0C.If the overall heat transfer coefficient is 650W/m^2 ^{0}C. Calculate the area of heat exchanger.	(7M)
	UNIT-V	
5.a)	With the help of typical experimental boiling curve explain the different regimes of pool boiling.	(7M)
5.b)	Explain about film wise condensation and drop wise condensation?	(7M)
	(OR)	
5.c)	What is Nucleate boiling and Give expression for heat transfer coefficient in Nucleate boiling.	(7M)
5.d)	Define the following: 1) Black body and opaque body 2)Stefan Boltzmann's Law 3) Wien's displacement law 4) Plank's Law	(7M)

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Course Code: 20ME6111

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)

III-B.Tech II-Semester Regular/Supplementary Examinations (BR20), April-2025

CAD / CAM (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)	Write briefly about Raster scan graphics coordinate system.	(7M)
1.b)	Discuss the advantages of CAD/CAM system.	(7M)

(OR)

1.c)	Explain about product cycle.	(7M)
1.d)	Describe the basic structure of CAD/CAM system.	(7M)

UNIT-II

2.a)	List out the important requirements of geometric modelling.	(7M)
2.b)	Distinguish between geometric form and algebraic form of surface representation.	(7M)

(OR)

2.c)	Distinguish between Bezier curve and B-Spline curve.	(7M)
2.d)	Discuss the various types of curve fitting techniques in detail.	(7M)

UNIT-III

3.a)	Describe the axis representation system used for CNC Milling machines. Discuss the various interpolation methods used in NC machines.	(7M)
3.b)	Discuss the several word functions in Numerical Control systems. Discuss the advantages of DNC over NC/CNC.	(7M)

(OR)

3.c)	Differentiate between i. Absolute and Incremental positioning system. ii. Fixed and Floating zero method.	(7M)
3.d)	Discuss the special features of NC machine tool when compared to the conventional machine tools.	(7M)

UNIT-IV

4.a)	Write out the types of FMS layouts in detail.	(7M)
4.b)	Explain the steps involved in Production flow analysis. Explain the reason to carry out such analysis.	(7M)

(OR)

4.c)	Evaluate which type of production systems, FMS is applied, Discuss the advantages of FMS.	(7M)
4.d)	Explain the FMS equipment and write the benefits of FMS.	(7M)

UNIT-V

5.a)	Justify the requirement of CAQC in current advanced manufacturing.	(7M)
5.b)	Explain in detail the different data files in CIM and the system reports generated by CIM.	(7M)

(OR)

5.c)	Classify different types of computer aided quality control.	(7M)
5.d)	Discuss the objectives and benefits of CAQC. Explain the different computer aided inspection methods.	(7M)

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BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)

III -B.Tech II-Semester Regular/Supplementary Examinations (BR20), APRIL-2025

DESSIGN OF TRANSMISSION ELEMENTS (ME)

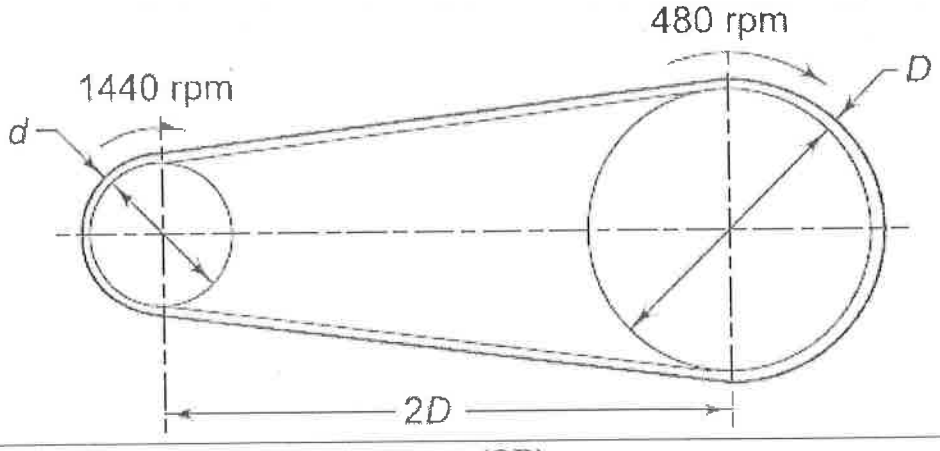
Time: 3 hours Max. Marks: 70

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

	UNIT-I	
1.a)	What are the advantages and disadvantages of hollow shaft over solid shaft?	(7M)
1.b)	A shaft made of mild steel is required to transmit 100 kW at 300 r.p.m. The supported length of the shaft is 3 metres. It carries two pulleys each weighing 1500 N supported at a distance of 1 metre from the ends respectively. Assuming the safe value of stress, determine the diameter of the shaft.	(7M)
	(OR)	
1.c)	Design a cast iron protective type flange coupling to transmit 15 kW at 900 r.p.m. from an electric motor to a compressor. The service factor may be assumed as 1.35. The following permissible stresses may be used : Shear stress for shaft, bolt and key material = 40 MPa; Crushing stress for bolt and key = 80 MPa; and Shear stress for cast iron = 8 MPa.	(14M)
	UNIT-II	
2.a)	A full journal bearing of 50 mm diameter and 100 mm long has a bearing pressure of 1.4 N/mm^2. The speed of the journal is 900 r.p.m. and the ratio of journal diameter to the diametral clearance is 1000. The bearing is lubricated with oil whose absolute viscosity at the operating temperature of 75°C may be taken as 0.011 kg/m-s. The room temperature is 35°C. Find: (i) The amount of artificial cooling required, and (ii) The mass of the lubricating oil required, if the difference between the outlet and inlet temperature of the oil is 10°C. Take specific heat of the oil as 1850J/kg/°C.	(14M)
	(OR)	
2.c)	What are rolling contact bearings? Discuss their advantages over sliding contact bearings.	(7M)
2.d)	A single row angular contact ball bearing number 310 is used for an axial flow compressor. The bearing is to carry a radial load of 2500 N and an axial or thrust load of 1500 N. Assuming light shock load, determine the rating life of the bearing.	(7M)
	UNIT-III	
3.a)	Write a short note on gear drives giving their advantages and disadvantages	(4M)
3.b)	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 only, taking into consideration the effect of the dynamic loading.	(10M)
	(OR)	
3.c)	Explain the gear tooth failures.	(4M)

	transmitting power to a 52 teeth gear. The module is 6 mm, while the face width is 75 mm. Both gears are made of steel with an ultimate tensile strength of 450 N/mm^2. They are heat treated to a surface hardness of 250 BHN. Assume that velocity factor accounts for the dynamic load. Calculate (i) beam strength; (ii) wear strength; and (iii) the rated power that the gears can transmit, if service factor and the factor of safety are 2 and 1.5, respectively.	
	UNIT-IV	
4.a)	Discuss the different types of belts and their material used for power transmission.	(4M)
4.b)	The layout of a leather belt drive transmitting 15 kW of power is shown in Fig. The centre distance between the pulleys is twice the diameter of the bigger pulley. The belt should operate at a velocity of 20 m/s approximately and the stresses in the belt should not exceed 2.25 N/mm^2. The density of leather is 0.95 g/cc and the coefficient of friction is 0.35. The thickness of the belt is 5 mm. Calculate: (i) the diameter of pulleys; (ii) the length and width of the belt; and (iii) the belt tensions. 	(10M)
	(OR)	
4.c)	Explain the following terms of the spring (i) Free length; (ii) Solid height; (iii) Spring rate; and (iv) Spring index.	(4M)
4.d)	Design a compression helical spring to carry a load of 500 N with a deflection of 25 mm. The spring index may be taken as 8. Assume the following values for the spring material: Permissible shear stress = 350 MPa and Modulus of rigidity = 84 kN/mm^2.	(10M)
	UNIT-V	
5.a)	Explain the various types of cylinder liners with neat sketches.	(4M)
5.b)	The cylinder of a four-stroke diesel engine has the following specifications: Brake power = 3.75 kW; Speed = 1000 rpm; Indicated mean effective pressure = 0.35 MPa and Mechanical efficiency = 80%. Determine the bore and length of the cylinder liner.	(10M)
	(OR)	
5.c)	Determine the dimensions of cross-section of the connecting rod for a diesel engine with the following data: Cylinder bore = 100 mm; Length of connecting rod = 350 mm; Maximum gas pressure = 4 MPa and Factor of safety = 6	(14M)

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Course Code: **20ME6E02**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)

III -B.Tech II-Semester Regular/Supplementary Examinations (BR20), April-2025

OPERATIONS RESEARCH (ME) –OPEN ELECTIVE-II

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: Provide Standard Normal Distribution Table

UNIT-I

1.a) Discuss the importance and characteristics of operations research. (7M)

1.b) The vitamins V and W are found in two different foods, F1 and F2. The respective prices per unit of each food are Rs. 3 and Rs. 2.5. One unit of F1 contains 2 units of vitamin V and 3 units of vitamin W. One unit of F2 contains 4 units of vitamin V and 2 units of vitamin W. The daily requirements of V and W are at least 60 units and 75 units respectively. Formulate an LPP to meet the daily requirements and solve graphically. (7M)

(OR)

1.c) Solve the following LPP by two phase simplex method (14M)

Maximize $Z = 2x_1 + 3x_2 + 5x_3$;

subject to

$3x_1 + 10x_2 + 5x_3 \leq 15$;

$x_1 + 2x_2 + x_3 \geq 4$;

$33x_1 - 10x_2 + 9x_3 \leq 33$;

$x_1, x_2, x_3 \geq 0$

UNIT-II

2.a) Solve the following transportation problem whose costs are given below: (14M)

		to					
		D1	D2	D3	D4	D5	Availability
from	A	4	1	2	6	9	100
	B	6	4	3	5	7	120
	C	5	2	6	4	8	120
	Requirements	40	50	70	90	90	

(OR)

2.c) Solve the following travelling salesman problem: (14M)

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

UNIT-III

3.a) There are six jobs each of which is to be processed through two machines A and B in the order AB. Processing times in hours are given below. Find the total elapsed time and idleness of machines? (14M)

Job	1	2	3	4	5	6
Machine A	4	8	5	6	8	7
Machine B	7	3	8	4	5	4

(OR)

3.c) Discuss the importance of replacement models. (7M)

3.d) Machine A costs Rs 45,000 and the operating costs are estimated at Rs 1000 for the first year, increasing by Rs 10,000 per year in the second and subsequent years. Machine B costs Rs 50,000 and operating costs are Rs 2000 for the first year, increasing by Rs 4000 in the second and subsequent years. If you have a machine of type A, should we replace with B? If so when? Assume that both machines have no resale value and future costs are not discounted. (7M)

UNIT-IV

4.a) Solve the following game whose payoff matrix is given below: (7M)

	B			
A	3	2	4	0
	3	4	2	4
	4	2	4	0
	0	4	0	8

4.b) Consider the payoff matrix of player A as shown below and solve it optimally using graphical method: (7M)

	B				
A	3	0	6	-1	7
	-1	5	-2	2	1

(OR)

4.c) Explain the kendal's notation for representing queuing model. (7M)

4.d) A T.V repairman finds that the time spent on his job has an exponential distribution with mean 30 min. If he repairs the sets in the order in which they come in and if the arrival of sets is poisson with an average rate of 10 per 8 hour day, what is the expected idle time in a day. How many jobs are ahead of the average set just brought in. (7M)

UNIT-V

5.a) A project consists of nine jobs (A, B, C.....I) with the following precedence relationship and time estimates. (14M)

Job	A	B	C	D	E	F	G	H	I
Prece:	-	-	A,B	A,B	B	D,E	C,F	D,E	G,H
Time	15	10	10	10	5	5	18	9	15

(i) Draw the project network (ii) Identify the critical path (iii) Calculate all the Float value for all the activities.

(OR)

5.c) Consider the following time estimates in weeks while doing a project: (14M)

Activity	1-2	1-6	2-3	2-4	3-5	4-5	6-7	5-8	7-8
Optimistic time	3	2	6	4	8	3	3	2	8
Most likely time	6	5	12	5	11	7	9	4	16
Pessimistic time	9	8	18	6	14	11	15	6	18

(i) Construct the project network and find the critical path for the project

(ii) What is the probability of completing the project within 35 weeks?

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Course Code: 20EC6110

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)

III -B. Tech II-Semester Regular/Supplementary Examinations (BR20), APRIL-2025

VLSI DESIGN (ECE)

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)	Explain in detail the p-well process for CMOS fabrication indicating the masks used?	(7M)
1.b)	Illustrate the Comparison between CMOS and Bipolar technologies.	(7M)
	(OR)	
1.c)	Explain the operation of Enhancement NMOS Transistor with respect to the output characteristics?	(7M)
1.d)	Write the differences between Enhancement MOS and Depletion MOS?	(7M)
	UNIT-II	
2.a)	Derive an expression for trans-conductance of an n-channel enhancement MOSFET operating in linear region?	(7M)
2.b)	Determine the pull–up to pull- down ratio of an nMOS inverter driven by another nMOS inverter?	(7M)
	(OR)	
2.c)	Derive Ids-Vds relationship of MOS transistor in Resistive region?	(7M)
2.d)	Explain the alternative forms of Pull up network?	(7M)
	UNIT-III	
3.a)	Draw the stick diagram & layout for the 2-input NAND gates using CMOS logic?	(7M)
3.b)	Illustrate and explain the use of various MOS layers with examples?	(7M)
	(OR)	
3.c)	Draw the VLSI design flow diagram and explain?	(7M)
3.d)	Explain about 2μm CMOS design rules and discuss with layout examples?	(7M)
	UNIT-IV	
4.a)	Explain the issues involved in driving large capacitor loads in VLSI circuit regions?	(7M)
4.b)	What is meant by sheet resistance Rs? Explain the concept of Rs applied to MOS transistors.	(7M)
	(OR)	
4.c)	What is inverter delay? How delay is calculated for multiple stages? Explain.	(7M)
4.d)	What is Scaling? Derive the Scaling factors for the following MOS parameters i. Gate Capacitance ii. Channel Resistance iii. Saturation Current iv. Current Density	(7M)
	UNIT-V	
5.a)	Give the steps in FPGA design flow with flow diagram and briefly discuss about each Step?	(7M)
5.b)	Discuss the key architectural elements and advantages of Xilinx XC4000 series FPGAs?	(7M)
	(OR)	
5.c)	Describe the basic architecture of an FPGA with neat labelled block diagrams.	(7M)
5.d)	List out the various FPGA families. Explain how they are different from each other?	(7M)

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Course Code: 20EC6T11

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
III-B.Tech II Semester Regular/Supplementary Examinations (BR20), APRIL-2025
Digital Signal Processing (ECE)

Time: 3 hours Max. Marks: 70

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*Question Paper consists of **5** units, each carrying 14 marks, each unit has **2** questions; either of them should be answered, All parts of a question must be answered at one place*

	UNIT-I	
1.a)	Explain the canonical (direct) form of digital filter realization.	(7M)
1.b)	Discuss the concept of stability and causality with examples.	(7M)
	(OR)	
1.c)	Determine the impulse response h(n) for the system described by the second order difference equation $y(n) - 4y(n-1) + 4y(n-2) = x(n-1)$	(7M)
1.d)	Check the following filter for time invariant, causal and linear (i) $y(n) = (n-1)x^2(n+1)$ (ii) $y(n) = n^2 x(n-2)$	(7M)
	UNIT-II	
2.a)	Explain the properties of DFT.	(7M)
2.b)	Explain Radix- 2 Decimation- in-Time algorithms.	(7M)
	(OR)	
2.c)	Compare overlap-save method and overlap-add method.	(7M)
2.d)	Find the DFT of the given sequence by using DIF-FFT. $x(n) = \{0.5, 1.5, -0.5, -0.5\}$	(7M)
	UNIT-III	
3.a)	Design a digital second order Low-Pass Butterworth filter with cut-off frequency 2.2KHz using Bilinear Transformation. Sampling rate 8 KHz.	(7M)
3.b)	What are the steps to design an analog Chebyshev low pass filter?	(7M)
	(OR)	
3.c)	Differentiate analog Butterworth and Chebyshev filters.	(7M)
3.d)	Describe the IIR filter design approximation using Bilinear Transformation method.	(7M)
	UNIT-IV	
4.a)	Using a rectangular window technique, design a low pass filter with pass band gain of unity, cut-off frequency of 1000Hz and working at a sampling frequency of 5 KHz. The length of the impulse response should be 7.	(7M)
4.b)	Compare IIR and FIR filters.	(7M)
	(OR)	
4.c)	Explain the Characteristics of FIR Digital printers.	(7M)
4.d)	List the features of rectangular window spectrum.	(7M)
	UNIT-V	
5.a)	Explain in detail the decimation and interpolation.	(14M)
	(OR)	
5.c)	Explain with block diagrams how can sampling rate be converted by a rational factor M/L both in time domain and frequency domain.	(7M)
5.d)	Discuss the applications of multi rate signal processing.	(7M)

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BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
III-B.Tech II-Semester Regular/Supplementary Examinations (BR20), APRIL-2025
Microwave and Optical Communication (ECE)

Time: 3 hours Max. Marks: 70

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*Question Paper consists of **5** units, each carrying 14 marks, each unit has **2** questions; either of them should be answered, All parts of a question must be answered at one place*

UNIT-I

1.a)	Derive the field expressions for TM Waves in a rectangular waveguides.	(7M)
1.b)	The dimensions of a rectangular waveguide are 2.5cm×1cm operating a 8.6GHz. Find the following i) Possible modes ii)Cu –off frequency iii)Guide wave length iv) Phase Velocity.	(7M)

(OR)

1.c)	List out the Microwave frequency Bands with applications.	(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 Reflex klystron.	(7M)
2.b)	What are the different modes of operation of a Gunn Diode and Explain.	(7M)

(OR)

2.c)	Explain about velocity modulation and Bunching Process in Two Cavity Klystron.	(7M)
2.d)	Explain the operation of Helix TWT.	(7M)

UNIT-III

3.a)	Explain the operation of circulator.	(7M)
3.b)	How to calculate power using Bolometer Method in a microwave bench.	(7M)

(OR)

3.c)	Calculate [S] matrix of a Magic Tee.	(7M)
3.d)	How to calculate attenuation by using reflection method.	(7M)

UNIT-IV

4.a)	Draw and explain the block diagram of optical fiber communication system.	(7M)
4.b)	Explain about different bending losses and scattering losses in optical cables .Discuss the different techniques to connect the 2 optical fibers with different lengths and also calculate the Joint losses.	(7M)

(OR)

4.c)	Define and derive the relations to the following i) Total Internal Reflections ii)Numerical Aperture.	(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)	Explain the physical principles and material structures of optical sources and detectors. Compare their quantum efficiency and performance parameters in detail.	(7M)
5.b)	Explain optical receiver and its configuration with a neat sketch.	(7M)

(OR)

5.c)	What is a link power budget in optical communication? Explain.	(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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Course Code: 20EC6D08

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)

III-B.Tech II-Semester Regular End Examinations (BR20), APR- 2025

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 the sampling and quantization in image processing?	(7M)
b)	Explain various distance measures between pixels.	(7M)
	(OR)	
1.c)	Explain Periodicity and Symmetry properties of 2-D DFT	(7M)
d)	Obtain H_4 and H_2 matrices in Haar transformations.	(7M)
	UNIT-II	
2.a)	Explain histogram processing.	(7M)
b)	Explain any two Image Sharping spatial domain filters.	(7M)
	(OR)	
2.c)	What is histogram processing? Explain with example.	(7M)
d)	What is Smoothing filter? Explain the process of smoothing.	(7M)
	UNIT-III	
3.a)	Explain about image degradation and restoration modelling.	(7M)
b)	What are band pass filters? Explain with an example.	(7M)
	(OR)	
3.c)	Explain about inverse filtering.	(7M)
d)	Explain adaptive filtering function in image restoration.	(7M)
	UNIT-IV	
4.a)	Explain RGB color model.	(7M)
b)	How is noise in color image occur? Explain	(7M)
	(OR)	
4.c)	What is basic full-color image processing? Explain.	(7M)
d)	Explain image segmentation based on color.	(7M)
	UNIT-V	
5.a)	What are the conditions for image segmentation?	(7M)
b)	Obtain the efficiency of Huffman coding for symbols {a,b,c,d} with respective probabilities {0.5, 0.25,0.125, 0.125}.	(7M)
	(OR)	
5.c)	Explain the types of thresholding in image segmentation.	(7M)
d)	Obtain the encoding sequence $a_2a_1a_4a_3$ using Arithmetic coding for symbols {a_1, a_2, a_3, a_4} with respective probabilities {0.2, 0.2, 0.4, 0.2}.	(7M)

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Course Code: 20AD6E01

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)

III-B.Tech II-Semester Regular/Supplementary Examinations (BR20), APRIL-2025

DOTNET TECHNOLOGIES [ECE, CSE(AI&DS)]

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)	Define CLR and explain the architecture of CLR.	(7M)	CO1	L2
1.b)	Illustrate the purpose of CLS and CTS in .Net Framework.	(7M)	CO1	L3
	(OR)			
1.c)	List out .NET Products, .NET Services and also outline the process of downloading and installing Microsoft Visual Studio Community Edition.	(7M)	CO1	L2
1.d)	Discuss the role of MSIL in .NET framework.	(7M)	CO1	L1
	UNIT-II			
2.a)	Write C# program to print Series of N even numbers.	(7M)	CO2	L3
2.b)	How to Declare, initialize and access arrays in C#.	(7M)	CO2	L2
	(OR)			
2.c)	Illustrate Array List and Hash Table classes from Collections in C#.	(7M)	CO2	L3
2.d)	Outline the concepts Boxing and Unboxing in C# with examples	(7M)	CO2	L2
	UNIT-III			
3.a)	Design Windows Application to Store given student roll number, name, and address into Database.	(7M)	CO3	L4
3.b)	Discuss the following Windows Form Controls with their properties i) Radio Button ii) Image List	(7M)	CO3	L1
	(OR)			
3.c)	What is the relation Between Data Set and Data Adapter explain?	(7M)	CO3	L1
3.d)	Develop Windows based GUI to illustrate the purpose of Menus.	(7M)	CO3	L4
	UNIT-IV			
4.a)	Examine various State management techniques in ASP.NET web applications.	(7M)	CO4	L4
4.b)	Illustrate the concept of Stored procedures in database with examples.	(7M)	CO4	L3
	(OR)			
4.c)	Outline the concept of Normalization and also explain 1NF, 2NF with examples.	(7M)	CO4	L2
4.d)	Design ASP.NET web application to display given user name and password in alert box.	(7M)	CO4	L4
	UNIT-V			
5.a)	Explain the concept of ASP.NET MVC architecture along with its benefits.	(7M)	CO5	L1
5.b)	Develop code by using Razor inline expression and Multi-statement code block.	(7M)	CO5	L3
	(OR)			
5.c)	Summarize various Controllers in ASP.NET MVC.	(7M)	CO5	L2
5.d)	How to deploy ASP.NET Web application in to IIS and windows Azure.	(7M)	CO5	L3

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Course Code: **20CS6T12**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)

III -B. Tech II-Semester Regular/Supplementary Examinations (BR20), APRIL-2025

COMPILER DESIGN

Common for 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)	Explain in detail about the role of Lexical analyser with the possible error Recovery actions.	(7M)
1.b)	What is a compiler? Give the differences between compiler and interpreter.	(7M)
	(OR)	
1.c)	Explain the phases of a compiler with a neat diagram.	(7M)
1.d)	Discuss about a language processing system with a neat diagram.	(7M)
	UNIT-II	
2.a)	Evaluate predictive parsing table for the grammar and find moves made by predictive parser on input id+id*id and find FIRST and FOLLOW. E→E+T | T, T→T*F | F, F→(E) | id	(7M)
2.b)	Describe the context free grammar with Examples.	(7M)
	(OR)	
2.c)	What is meant by a derivation, parse tree? Consider the context free grammar S -> SS+|SS*|a and the string aa+a* i) Give a leftmost derivation ii) Give a rightmost derivation iii) Give a parse tree. iv) Is the grammar ambiguous or unambiguous?	(14M)
	UNIT-III	
3.a)	Compare and contrast between SLR, LALR and LR parses.	(14M)
	(OR)	
3.b)	What is LR parser? What is LR(0) item? Write the functions for computing CLOSURE(I) , GOTO(I,X) and find the LR(0) items for the following grammar. S -> (L)|a, L -> L , S|R, R -> b.	(7M)
3.c)	Construct the SLR sets of items for the grammar S->S S + | S S * | a Compute GOTO functions for these sets of items. Show the parsing table for this grammar. Is the grammar SLR?	(7M)
	UNIT-IV	
4.a)	Write SDTs for the Boolean expression grammar.	(7M)
4.b)	What is the conceptual view of the syntax-directed translation?	(7M)
	(OR)	
4.c)	What is type system? Discuss static and dynamic checking of types.	(7M)
4.d)	Prepare the three address code sequence for the assignment statement. d:= (a- b) + (a-c) + (a-c).	(7M)

	UNIT-V	
5.a)	What are design considerations of code generator? Explain.	(7M)
5.b)	Explain the simple code generator algorithm and generate target code sequence for the following statement d:=(a-b)+(a-c)+(a-c).	(7M)
	(OR)	
5.c)	What is a Flow Graph? Explain how a given program can be converted in to a Flow graph?	(7M)
5.d)	Describe the techniques of structure preserving transformations	(7M)

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Course Code: 20CS6T15

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)

III -B. Tech II-Semester Regular/Supplementary Examinations (BR20), APRIL-2025

DATA MINING AND DATA WAREHOUSING (CSE & ALLIED)

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 Data Mining? Why is it important? Discuss in detail. (7M)

1.b) What are Data Mining Task Primitives? Explain with examples. (7M)

(OR)

1.c) Elaborate on various types of patterns that can be mined and their significance. (7M)

1.d) What is KDD? Explain about data mining as a step in the process of knowledge discovery. (7M)

UNIT-II

2.a) Explain various data cleaning techniques used in Data Mining. (7M)

2.b) Explain the architecture of a data warehouse and its components. (7M)

(OR)

2.c) Discuss the concept of data reduction and its techniques. (7M)

2.d) Compare OLAP and OLTP. (7M)

UNIT-III

3.a) Can we design a method that mines the complete set of frequent item sets without candidate generation? If yes, explain with an example? (7M)

3.b) Explain the process of Rule Generation in Association Analysis. (7M)

(OR)

3.c) Explain the concept of **support** and **confidence** in Association Rule Mining with example and also mention the real life applications of Association Rule Mining. (7M)

3.d) Find the Frequent itemsets from the following database using Apriori algorithm. Assume that minimum support (s = 3) (7M)

Transaction ID	Items
T1	Hot Dogs, Buns, Ketchup
T2	Hot Dogs, Buns
T3	Hot Dogs, Coke, Chips
T4	Chips, Coke
T5	Chips, Ketchup
T6	Hot Dogs, Coke, Chips

UNIT-IV

4.a) Explain decision tree induction algorithm for classifying data tuples and with suitable example. (7M)

4.b) What is Naïve Bayesian Classification? Explain its working with an example. (7M)

(OR)

4.c) What are the common measures for selecting the best split in Decision Tree Induction? Explain with examples. (7M)

4.d) Compare and contrast Decision Trees, Naïve Bayesian Classification, and Bayesian Belief Networks in terms of advantages and limitations. (7M)

UNIT-V

5.a) Define cluster analysis. List and explain applications of cluster analysis. (7M)

5.b) Analyse the traditional density-based approach in clustering and how it applies to DBSCAN. (7M)

(OR)

5.c) What are the key strengths and weaknesses of K-means clustering? (7M)

5.d) Examine the working of Agglomerative Hierarchical Clustering algorithm. (7M)

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BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)

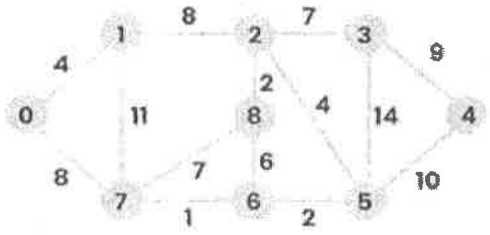
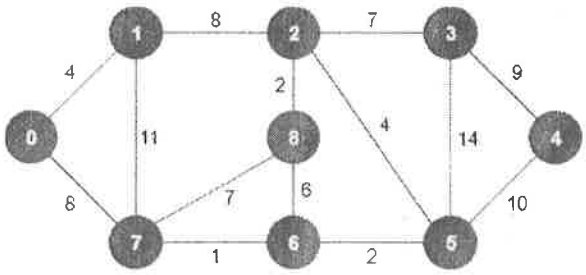
III -B.Tech II-Semester Regular/Supplementary Examinations (BR20), APRIL-2025

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)	Explain the properties / characteristics of an algorithm with an example.	(7M)
1.b)	Give the algorithm for matrix multiplication and find the time complexity of the algorithm using step count method.	(7M)
	(OR)	
1.c)	Distinguish between Algorithm and Pseudocode.	(7M)
1.d)	Discuss the amortized analysis with an example.	(7M)
	UNIT-II	
2.a)	Write Divide – And – Conquer recursive Quick sort algorithm and analyze the algorithm for average time complexity.	(7M)
2.b)	Explain Merge sort algorithm and trace this algorithm for n = 8 elements: 24, 12, 35, 23, 45, 34, 20, 48.	(7M)
	(OR)	
2.c)	Explain Recursive Binary search algorithm with suitable examples.	(7M)
2.d)	Write the General method and Control Abstraction of Divide – and – Conquer.	(7M)
	UNIT-III	
3.a)	Find an optimal sequence to the n=5 Jobs where profits (P1,P2,P3,P4,P5) = (20,15,10,5,1) and deadlines (d1,d2,d3,d4,d5) =(2,2,1,3,3).	(7M)
3.b)	Illustrate the Single source short paths 	(7M)
	(OR)	
3.c)	Choose an algorithm for prim's method and find the Minimum Cost spanning tree for the following graph. 	(7M)
3.d)	Analyze the following instance of 0/1 KNAPSACK problem using dynamic programming n = 3, (W1, W2, W3) = (2, 3, 4), (P1, P2, P3) = (1, 2, 5), and m = 6.	(7M)

	UNIT-IV	
4.a)	Explain how Matrix – chain Multiplication problem can be solved using dynamic programming with suitable example.	(7M)
4.b)	Explain string addition problem with suitable examples.	(7M)
	(OR)	
4.c)	Draw an Optimal Binary Search Tree for n=4 identifiers (a1,a2,a3,a4) = (do, if, read, while) P(1:4)=(3,3,1,1) and Q(0:4)=(2,3,1,1,1).	(7M)
4.d)	What is All – Pair Shortest Path problem (APSP)? Discuss the Floyd's APSP algorithm and discuss the analysis of this algorithm	(7M)
	UNIT-V	
5.a)	What is a Backtracking and give the 4 – Queens's solution. Draw the portion of the state space tree for n = 4 queens using backtracking algorithm.	(7M)
5.b)	Solve the sum of subset problem n=4, sum=13, and w1=3, w2=4, w3=5 and w4=6. Solve the problem using backtracking.	(7M)
	(OR)	
5.c)	Explain the Graph – coloring problem. And draw the state space tree for m= 3 colors n=4 vertices graph. Discuss the time and space complexity.	(7M)
5.d)	What is a Hamiltonian Cycle? Explain how to find Hamiltonian path and cycle using backtracking algorithm.	(7M)

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Course Code: 20CS6D05

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)

III-B.Tech II-Semester Regular/Supplementary Examinations (BR20), APRIL-2025

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)	Define the concept of hypothesis space in machine learning.	(7M)
1.b)	Explain the role of concept learning in developing a learning system.	(7M)
	(OR)	
1.c)	Compare the general-to-specific ordering of hypotheses with version space learning.	(7M)
1.d)	Analyze the importance of function approximation in machine learning applications.	(7M)
	UNIT-II	
2.a)	What is information gain, and why is it used in decision tree learning?	(7M)
2.b)	Illustrate how overfitting occurs in decision tree learning.	(7M)
	(OR)	
2.c)	Apply cross-validation to compare two decision tree models trained on the same dataset.	(7M)
2.d)	Evaluate the effectiveness of pruning techniques in improving decision tree performance.	(7M)
	UNIT-III	
3.a)	Define Probably Approximately Correct (PAC) learning.	(7M)
3.b)	Explain the significance of Vapnik-Chervonenkis (VC) dimension in computational learning theory.	(7M)
	(OR)	
3.c)	Apply inductive logic programming to a simple classification problem.	(7M)
3.d)	Analyze the advantages and limitations of inverse resolution in rule learning.	(7M)
	UNIT-IV	
4.a)	What is a maximum margin classifier in SVM?	(7M)
4.b)	Explain the role of quadratic programming in solving SVM optimization problems.	(7M)
	(OR)	
4.c)	Demonstrate how kernel functions help in handling non-linearly separable data in SVM.	(7M)
4.d)	Analyze the trade-offs between linear and non-linear SVM classifiers.	(7M)
	UNIT-V	
5.a)	Define the Bayes theorem and its relevance in machine learning.	(7M)
5.b)	Explain how Naïve Bayes classifiers assume independence among features.	(7M)
	(OR)	
5.c)	Apply the K-Nearest Neighbors (KNN) algorithm to classify a dataset with unknown labels.	(7M)
5.d)	Evaluate the differences between generative and discriminative learning approaches.	(7M)

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Course Code: 20CS6E03

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
III-B.Tech II-Semester Regular/Supplementary Examinations (BR20), APRIL-2025
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)	Briefly discuss the Internet and World Wide Web.	(7M)
1.b)	Explain the structure of an essential HTML5 document with an example.	(7M)
	(OR)	
1.c)	Explain the working of the HTTP protocol and its methods.	(7M)
1.d)	What is DOM? How is it used in dynamic HTML?	(7M)
	UNIT-II	
2.a)	Write short notes on control statements and functions in JavaScript.	(7M)
2.b)	Design a simple web form that accepts user input and uses JavaScript for client-side validation.	(7M)
	(OR)	
2.c)	Explain how JavaScript handles DOM manipulation with examples.	(7M)
2.d)	Develop a small interactive webpage that includes HTML, CSS, and JavaScript.	(7M)
	UNIT-III	
3.a)	Explain the architecture of Node.js. How does its event-driven model work?	(7M)
3.b)	What are the core modules in Node.js? Name any four.	(7M)
	(OR)	
3.c)	How do you install and use external packages in Node.js?	(7M)
3.d)	Explain the concept of middleware chaining in Express.js.	(7M)
	UNIT-IV	
4.a)	Discuss the Obstacles and Roadblocks in React Js.	(7M)
4.b)	How do you design URIs using RESTful web services?	(7M)
	(OR)	
4.c)	Explain in detail the React components and React DOM.	(7M)
4.d)	Illustrate with an example how virtual DOM is used in React JS..	(7M)
	UNIT-V	
5.a)	Discuss the core features of Mongo DB.	(7M)
5.b)	Explain the process of deploying an application using Cloud platforms.	(7M)
	(OR)	
5.c)	Explain Mongo DB architecture.	(7M)
5.d)	Explain Collections in Mongo DB and how to retrieves user data.	(7M)

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Course Code: 20AD6105

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE: ODALAREVU
(AUTONOMOUS)

III-B. Tech II-Semester Regular End Examinations (BR20), APRIL-2025

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)	Describe any five different applications of Artificial Intelligence.	(7M)
1.b)	Explain Random forests algorithm in detail.	(7M)
	(OR)	
1.c)	Explain about Overfitting and Underfitting.	(7M)
1.d)	Explain different types of Evaluating methods in Machine learning.	(7M)
	UNIT-II	
2.a)	Explain differences between Biological and Artificial Neural Network.	(7M)
2.b)	Explain the steps involved in the training of Deep networks.	(7M)
	(OR)	
2.c)	Explain the important parameters in the improving of Deep Networks.	(7M)
2.d)	What is NLP? Explain the purpose of NLP.	(7M)
	UNIT-III	
3.a)	Describe Anatomy of Neural Network.	(7M)
3.b)	Explain deep learning frame works such as Theano and CNTK.	(7M)
	(OR)	
3.c)	Explain various types of Neural Networks with its architecture.	(7M)
3.d)	Explain newswires as multi label classification problems with appropriate model.	(7M)
	UNIT-IV	
4.a)	Illustrate Multichannel Convolution Operation.	(7M)
4.b)	Explain implementation of CNN in PyTorch.	(7M)
	(OR)	
4.c)	Explain different types of RNNs and its disadvantages.	(7M)
4.d)	Illustrate Recurrent Neural Network (RNN).	(7M)
	UNIT-V	
5.a)	Describe GAN with appropriate example.	(7M)
5.b)	Explain an algorithm for Policy Gradient methods with function approximation.	(7M)
	(OR)	
5.c)	Explain Boltzmann and Restricted Boltzmann Machines.	(7M)
5.d)	Explain Deep Belief Networks in detail.	(7M)

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BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)

III -B. Tech II-Semester Regular/Supplementary Examinations (BR20), APRIL-2025

DESIGN AND ANALYSIS OF ALGORITHMS

[CSE(AIDS), 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) Write about the time complexity with an example. (7M)

1.b) Write about the space complexity with an example. (7M)

(OR)

1.c) f(n)=O(g(n)), f(n)=Ω(g(n)) and f(n)=Θ(g(n)), illustrate these relations in estimating the time complexities with suitable examples. (7M)

1.d) Define an algorithm and write the characteristics of algorithm. (7M)

UNIT-II

2.a) Simulate Quick sort algorithm for the following example 25,36,12,4,5,16,58,54,24,16,9,65,78. (14M)

(OR)

2.c) Apply divide and conquer to search an element 'k' in an array a [1: n] using binary search and explain the algorithm. (7M)

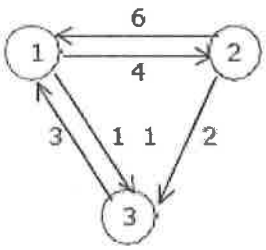
2.d) L= {2, 12, 18,3,34, 27, 56, 4, 8, 3, 10} write and explain the merge sort algorithm that outputs the sorted list of elements. (7M)

UNIT-III

3.a) What is the minimum spanning tree and discuss about the prims and kruskal algorithms with suitable examples. (14M)

(OR)

3.c) Given a weighted digraph G = (V, E) with weight. Determine the length of the shortest path between all pairs of vertices in G. Here we assume that there are no cycles with zero or negative cost. (14M)



UNIT-IV

4.a) Give the optimal solution for 0/1 knapsack problem using dynamic programming method.(p1,p2,p3, p4) = (11, 21, 31, 33), (w1, w2, w3, w4) = (2, 11, 22, 15), M=40, n=4. (14M)

(OR)

4.c) Explain how solution will be provided for all pairs shortest path problem using dynamic programming. (14M)

UNIT-V

5. a) Give the solution to the n queen's problems using backtracking. (14M)

(OR)

5. c) Explain Hamiltonian Cycle with suitable example. (7M)

5. d) Define Back tracking? Explain graph colouring using back tracking with an example. (7M)

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Course Code: **20EC6E02**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)

III -B. Tech II-Semester Regular Examinations (BR20), APRIL-2025

MICROCONTROLLERS AND APPLICATIONS

(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)	Describe the internal and external memory organization of the 8051 microcontroller.	(7M)
1.b)	Discuss the different types of registers available in the 8051 microcontroller.	(7M)
	(OR)	
1.c)	Describe the different modes of operation of timers in the 8051 microcontroller.	(7M)
1.d)	Discuss the interrupt structure of the 8051 microcontroller with an example.	(7M)

UNIT-II

2.a)	Explain the basic structure of assembly language programming in the 8051 microcontroller with an example.	(7M)
2.b)	Discuss the various arithmetic instructions available in the 8051 instruction set with examples.	(7M)
	(OR)	
2.c)	Write an assembly language program to demonstrate the use of conditional and unconditional jump instructions in the 8051 microcontroller.	(7M)
2.d)	Describe the program flow control instructions in the 8051 microcontroller with examples.	(7M)

UNIT-III

3.a)	Describe multiple sources of interrupts in a microcontroller and how they are managed efficiently.	(7M)
3.b)	What are non-maskable interrupts (NMI)? Explain their significance and provide examples of such sources?	(7M)
	(OR)	
3.c)	Discuss the role of interrupt service routines (ISRs) in handling interrupts and the steps involved in servicing an interrupt.	(7M)
3.d)	What is a non-maskable interrupt (NMI)? Explain its significance in a microcontroller?	(7M)

UNIT-IV

4.a)	Differentiate between a free-running counter and a programmable timer in an MCU. Provide examples of their applications.	(7M)
4.b)	Describe the various timer modes available in microcontrollers and their significance in real-time control systems.	(7M)
	(OR)	
4.c)	How does a watchdog timer differ from a free-running timer in an MCU? Explain their roles in embedded system reliability?	(7M)
4.d)	Explain the significance of timer pre scalars in microcontroller-based real-time applications. How do they affect timer resolution?	(7M)

UNIT-V

5.a)	Discuss the method of interfacing an LED with a microcontroller.	(7M)
5.b)	Explain how a 7-segment LED display works. How can it be interfaced with a MC?	(7M)
	(OR)	
5.c)	Describe the different modes of operation of the 8279 keyboard/display controller. How is data transferred to and from the 8279?	(7M)
5.d)	Explain how a 16x2 alphanumeric LCD display is interfaced with a microcontroller.	(7M)

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