Course Code: 23BS2T01

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)

I B.Tech II Semester Regular / Supplementary Examinations (BR23), JUNE-2025

DIFFERENTIAL EQUATIONS AND VECTOR CALCULUS

(Common to all branches)

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 Exact differential equation.	1	1	(2M)
b)	Solve $(2x+e^y)dx+xe^ydy=0$	2	1	(2M)
c)	Find the P.I of $(D^2-5D+6)=e^{4x}$	1	2	(2M)
d)	Explain homogeneous higher order linear differential equation.	2	2	(2M)
e)	Solve $xp+yq=z$	2	3	(2M)
f)	Eliminating c from $y = cx + c - c^3$	2	3	(2M)
g)	Show that $\bar{A} = 3y^4z^2\bar{\imath} + 4x^3z^2\bar{\jmath} - 3x^2y^2\bar{k}$ is Solenoidal vector.	2	4	(2M)
h)	Define solenoidal vector.	1	4	(2M)
i)	State Green's theorem.	2	5	(2M)
j)	Evaluate $\oint(x^2 + yz)dz$ where c is given by x=t , y= t^2 , z=3t , $1 \leq t \leq 2$.	2	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	A body is originally at $100^\circ c$ and cools down to $75^\circ c$ in 10 minutes. If the temperature of the air is $20^\circ c$, find the temperature of the body after 30 minutes and when will be the temperature be $25^\circ c$.	3	1	(10M)
	(OR)			
3.	Show that the system of confocal conics $\frac{x^2}{a^2+\lambda} + \frac{y^2}{b^2+\lambda} = 1$, where λ is a parameter, is self-orthogonal.	3	1	(10M)

St 8/M

	UNIT-II			
4.	Solve $(D^2+1)y = Tanx$ by the method of variation of parameters	3	2	(10M)
	(OR)			
5.	Solve the differential equation $(D^2-5D+6)y = e^x sinx$	2	2	(10M)
	UNIT-III			
6.	Solve $(x^2-yz)p+(y^2-zx)q=(z^2-xy)$	3	3	(10M)
	(OR)			
7.(a)	Solve $\frac{\partial^2 z}{\partial x^2} + \frac{\partial^2 z}{\partial x\,\partial y} - 6\frac{\partial^2 z}{\partial y^2} = \cos(2x+y)$	3	3	(10M)
	UNIT-IV			
8.(a)	Find the directional derivative of the scalar function $f = x^2yz+4xz^2$ at (1,-2,1) in the direction of the vector 2i-j-2k.	3	4	(5M)
8.(b)	Find the value of a and b so that the surface $ax^2 - byz = (a+2)x$ is orthogonal to the surface $4x^2y + z^3 = 4$ at $(1,-1,2)$.	3	4	(5M)
	(OR)			
9.	Find the directional derivative of $f= 2x^2 + z^2$ at (1,-1,3) in the direction of the vector $\bar{\imath} + 2\bar{\jmath} + 3\bar{k}$	3	4	(10M)
	UNIT-V			
10.	Verify Green's theorem for $\oint(xy+y^2)dx + (x^2)dy$ where C is the curves bounded by $y = x$ & $y = x^2$.	2	5	(10M)
	(OR)			
11(a)	Calculate the work done by force $F = 3xyi - y^2j$ in moving a particle in xy-plane from (0,1) to (1,2) along parabola $y = x^2$.	3	5	(5M)
11(b)	Find the work done in moving a particle in the force field $\vec{F} = 3x^2\bar{\imath} + (2xz-y)\bar{\jmath} + z\bar{k}$ along the straight line from (0,0,0) to (2,1,3).	2	5	(5M)

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Course Code: **23BS2T04**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)

I B.Tech II Semester Regular / Supplementary Examinations (BR23), JUNE-2025

ENGINEERING CHEMISTRY (CE, 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 the reasons for permanent hardness? How it is removed?	1	1	(2M)
b)	Summarize Caustic embrittlement.	2	1	(2M)
c)	Interpret Nernst's equation for the EMF of a cell and explain the terms involved.	2	2	(2M)
d)	Define Pilling Bed worth's rule and write its applications.	1	2	(2M)
e)	Show the preparation and uses of PVC.	2	3	(2M)
f)	Compare GCV and LCV.	2	3	(2M)
g)	Define and write any two applications of lubricants.	1	4	(2M)
h)	List the constituents of Portland cement.	1	4	(2M)
i)	Explain the reasons for micelle formation.	1	5	(2M)
j)	Summarize BET equation for characterization of nano materials	2	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	Explain in detail Boiler troubles.	2	1	(10M)
	(OR)			
3.(a)	Explain in detail Ion Exchange process with a neat diagram.	2	1	(5M)
3.(b)	Explain Desalination of brackish water by Reverse Osmosis using a neat sketch.	2	1	(5M)
	UNIT-II			
4.(a)	Define Secondary cell and Explain Lithium -Ion battery.	2	2	(5M)
4.(b)	Summarize Cathodic protection.	2	2	(5M)
	(OR)			
5.	Define and classify corrosion. Explain the mechanism of electrochemical corrosion.	2	2	(10M)

3, 4, 7, 8, 11

UNIT-III

6.	Illustrate the preparation, properties and applications of Bakelite, Nylon 6,6 and Buna-s rubber.	2	3	(10M)
	(OR)			
7.(a)	Compare Thermoplastics and Thermo setting plastics.	2	3	(5M)
7.(b)	Explain Refining of Petroleum with a neat diagram.	2	3	(5M)

UNIT-IV

8.(a)	Illustrate composites with suitable applications.	2	4	(5M)
8.(b)	Explain setting and hardening of Portland cement.	2	4	(5M)
	(OR)			
9.	List the properties of lubricants and discuss about viscosity index, flash point, fire point and cloud point.	4	4	(10M)

UNIT-V

10.	Explain Sol Gel method of preparation of nano materials.	2	5	(10M)
	(OR)			
11(a)	Summarize Freund lich's adsorption Isotherm.	2	5	(5M)
11(b)	Show the synthesis of colloids.	2	5	(5M)

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Course Code: **23BS2T03**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)

I B.Tech II Semester Regular/Supplementary Examinations (BR23), June-2025

CHEMISTRY [EEE, ECE]

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)

		BTL	CO	Marks
1.a)	Write the electronic configuration of O_2 molecule as per MOT.	1	1	(2M)
b)	What are the boundary conditions for a particle in one dimensional box?	3	1	(2M)
c)	Describe the bandgap of semiconductors.	1	2	(2M)
d)	Outline about the nanomaterials used in different sectors.	2	2	(2M)
e)	Write the Nernst equation and its significance.	1	3	(2M)
f)	Differentiate between primary and secondary cells.	2	3	(2M)
g)	Write the examples of conducting polymers.	3	4	(2M)
h)	Sketch the structures of Buna-N and Buna-S.	2	4	(2M)
i)	Write the different electronic transitions in UV-Visible spectroscopy.	3	5	(2M)
j)	Give any two applications of HPLC.	3	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.(a)	Derive the expression of Schrodinger wave equation and write the significance of ψ and ψ^2.	1	1	(5M)
2.(b)	Calculate bond order and electronic configuration of Nitrogen molecule with the help of MO energy level diagram.	2	1	(5M)
	(OR)			
3.(a)	Describe the characteristics of the potential energy in a one-dimensional box and its significance in quantum mechanics.	1	1	(5M)
3.(b)	Sketch the Π-Molecular energy level diagram of Benzene.	2	1	(5M)
	UNIT-II			
4.(a)	Describe about Graphene and give its detailed properties.	3	2	(5M)
4.(b)	What is intrinsic semiconductor and explain the formation of extrinsic semiconductors through doping.	2	2	(5M)
	(OR)			
5.(a)	Differentiate between single-walled and multi-walled carbon nanotubes.	2	2	(5M)
5.(b)	Explain the concept of hole and electron mobility in semiconductors.	3	2	(5M)
	UNIT-III			
6.(a)	Classify fuel cells and explain about how fuel cells are superior than batteries.	2	3	(5M)
6.(b)	What is the Electrode potential of a half cell for Zinc electrode dipping in a 0.01M Zinc solution? (The standard electrode potential of cell is E^0= 0.763V).	3	3	(5M)

All

	(OR)			
7.(a)	Discuss brief about the Conductometric titrations and its merits.	2	3	(5M)
7.(b)	Sketch the neat diagram of Zinc-Air battery and discuss about working, cell reactions and applications.	2	3	(5M)
	UNIT-IV			
8.(a)	Give an account on the preparation, properties and application of Poly lactic acid.	3	4	(5M)
8.(b)	Mention few natural and synthetic polymers and write applications of PVC.	3	4	(5M)
	(OR)			
9.(a)	Differentiate between thermoplastics and thermosetting plastics.	2	4	(5M)
9.(b)	Explain free radical mechanism of addition polymerization.	2	4	(5M)
	UNIT-V			
10.(a)	State and derive the Beer-lambert's law and its significance.	2	5	(5M)
10.(b)	What is chromatography? What are its types?	2	5	(5M)
	(OR)			
11.(a)	Give detailed account on UV-Visible spectroscopy instrumentation and current trends in Pharma sector.	3	5	(5M)
11.(b)	Describe various types of Vibrations in IR Spectroscopy.	3	5	(5M)

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Course Code: 23BS2T02

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE: ODALAREVU

(AUTONOMOUS)

I-B.Tech II-Semester Regular/Supplementary Examinations (BR23), June-2025

Engineering Physics

(CSE/IT/CSE(AIDS)/AIML/CSE(AIML))

Time:3 hrs **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

		CO	BL	M
1.a)	Explain about interference of light.	CO1	2	2
b)	What is polarization? Mention the applications of polarized light	CO1	1	2
c)	What are Miller indices?	CO2	1	2
d)	Write a short note on X-ray diffraction	CO2	1	2
e)	Define internal fields in dielectric materials	CO3	1	2
f)	What is hysteresis?	CO3	1	2
g)	Explain dual nature of matter	CO4	2	2
h)	Write the demerits of classical free electron theory.	CO4	1	2
i)	Define diffusion current.	CO5	1	2
j)	What is Hall effect?	CO5	1	2

Part-B

	UNIT-I			
2.	Describe Fraunhofer diffraction due to a single slit and deduce the positions of maxima and minima.	CO1	2	10
	OR			
3.	Determine the diameter of dark and bright rings in the formation of Newton's rings.	CO1	2	10
	UNIT-II			
4.	Explain the following in case of BCC i. Lattice points per unit cell ii. Atomic radius iii. Atomic packing fraction iv. Coordination number	CO2	2	10
	OR			

SA-1

5.	Describe the powder method for analysis of crystal structure. What are the advantages of this method?	CO2	2	10
	UNIT-III			
6.	What is meant by Polarization in dielectrics? Explain the various types of Polarizations in dielectrics.	CO3	2	10
	OR			
7.	Classify the magnetic materials based on their magnetic behavior.	CO3	4	10
	UNIT-IV			
8.	Derive an expression for energies of a particle in 1-D potential box.	CO4	3	10
	OR			
9.	Explain the following: i. Fermi-Dirac distribution ii. Fermi Energy	CO4	2	10
	UNIT-V			
10.	Differentiate between intrinsic and extrinsic semi-conductors.	CO5	4	10
	OR			
11.	What is fermi energy level? Explain the dependence of fermi level on carrier concentration and temperature.	CO5	2	10

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Course Code: 23ES2T01

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
I-B.Tech II-Semester Regular/Supplementary Examinations (BR23), June-2025

BASIC CIVIL & MECHANICAL ENGINEERING
(Common to CE, EEE, ME &ECE)

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

1.The question paper consists of two parts, viz., Part A and Part B, with an equal weight of 35 marks each.
2.The student is instructed to write Part A from pages 1 to 16, and Part B from pages 17 to 32.
3. Answer all five questions in Section A of Part A and Part B. Each question carries one mark.
4. Answer three questions from Section B with the 'EITHER' 'OR' choice one from each unit. Each question carries 10 Marks.

PART –A (BASIC CIVILENGINEERING)

SECTION –A **5 X 1 = 5**

1.a)	Define Cement.	BL1	CO1	[1M]
1.b)	Define Consolidation.	BL1	CO2	[1M]
1.c)	Define Rigid Pavements.	BL1	CO3	[1M]
1.d)	Define surveying.	BL2	CO2	[1M]
1.e)	What is Rain Water Harvesting?	BL1	CO3	[1M]

SECTION –B **3 X 10 = 30**

	UNIT-I			
2.	How Civil Engineer does benefits the society and explain his role.	BL2	CO1	[10M]
	(OR)			
3.	What are Prefabricated Construction Techniques?	BL2	CO1	[10M]
	UNIT-II			
4.	Explain the differences between Shallow and Deep Foundations.	BL1	CO2	[10M]
	(OR)			
5.	What is the principle aim to prestressing concrete?	BL2	CO2	[10M]
	UNIT-III			
6.	What is the importance of Rain Water Harvesting?	BL2	CO3	[10M]
	(OR)			
7.	What is the importance of Transportation in Nations's Economic development?	BL2	CO3	[10M]

MDS 1 BCME OCT-24

PART –B (BASIC MECHANICAL ENGINEERING)

SECTION –A **5 X 1 = 5**

8.a)	What do you understand by the following Casting terms: (i) Sprue; (ii) Runner	BL3	CO1	[1M]
8.b)	What are the conditions for thermodynamic equilibrium?	BL2	CO2	[1M]
8.c)	What are the advantages of Belt drives?	BL3	CO3	[1M]
8.d)	Define Links and joints?	BL3	CO4	[1M]
8.e)	List any four defeats in casting?	BL3	CO5	[1M]

SECTION –B **3 X 10 = 30**

	UNIT-I			
9.	Discuss the role of mechanical engineer in the industry and society.	BL3	CO1	[10M]
	(OR)			
10.	Explain the smart materials and what are the advantages, disadvantages and applications of smart materials.	BL3	CO1	[10M]
	UNIT-II			
11.	Difference between the 2 -Stoke and 4 -Stroke engines?	BL2	CO2	[10M]
	(OR)			
12.	Explain the concept of thermodynamic equilibrium. What is its importance in thermodynamics	BL2	CO2	[10M]
	UNIT-III			
13.	Explain briefly the differences between simple, compound, and epi-cyclic gear trains.	BL3	CO3	[10M]
	(OR)			
14.	What are the links, joints and configuration of Robots and explain the applications of Robots.	BL3	CO4	[10M]

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Course Code: **23ES2T02**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE: ODALAREVU
(AUTONOMOUS)

I-B.Tech II-Semester Regular/Supplementary Examinations (BR23), JUNE-2025

Basic Electrical and Electronics Engineering

[Common to CSE, CSE (AI&DS), AI&ML & CSE (AI&ML)]

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

1. The question paper consists of two parts, viz., Part A and Part B, with an equal weight of 35 marks each.
2. The student is instructed to write Part A from pages 1 to 16, and Part B from pages 17 to 32.
3. Answer all five questions in Section A of Part A and Part B. Each question carries one mark.
*4. Answer three questions from Section B of Part A and Part B with the **'EITHER' 'OR'** choice one from each unit. Each question carries 10 Marks.*

PART –A (ELECTRICAL EENGINEERING)

SECTION –A

5 X 1 = 5M

1.a)	State Ohm's law.	BL1	CO1	[1M]
1.b)	Define form factor of the sinusoidal waveform.	BL1	CO1	[1M]
1.c)	Differentiate between Moving coil and Moving iron instruments.	BL2	CO2	[1M]
1.d)	What is two-part electricity tariff?	BL1	CO3	[1M]
1.e)	Label any two power rating of household appliances.	BL1	CO3	[1M]

SECTION –B

3 X 10 = 30M

	UNIT-I			
2.a)	State and Explain Superposition theorem with an example.	BL2	CO1	[10M]
	(OR)			
3.a)	A 240 V, 50 Hz AC supply is applied a coil of 0.08 H inductance and 4 Ω resistance connected in series with a capacitor of 8 μF. Calculate the following (i) Impedance, (ii) Circuit current, (iii) Active power (iv) Reactive power (v) Power factor.	BL3	CO1	[5M]
b)	Write the V-I relations of the Electrical circuit elements.	BL1	CO1	[5M]
	UNIT-II			
4.a)	With neat diagrams, explain the constructional features of salient pole and non-salient pole rotor of three-phase alternator.	BL2	CO2	[10M]
	(OR)			
5.a)	Explain the working principle of Wheatstone bridge and derive the bridge balance equation.	BL3	CO2	[5M]
b)	Explain the construction and working principle of single-phase transformer.	BL2	CO2	[5M]
	UNIT-III			
6.a)	Distinguish between fuse and MCB.	BL2	CO3	[5M]
b)	Classify and explain about various types of energy resources.	BL2	CO3	[5M]
	(OR)			
7.a)	Draw the layout of hydropower plant and explain about various parts of it.	BL3	CO3	[10M]

MDS - 3 5 6 10 11 14

PART –B (ELECTRONICS ENGINEERING)

SECTION –A **5 X 1 = 5M**

8.a)	What is P-type semiconductor?	BL1	CO4	[1M]
8.b)	Draw the circuit symbols of PNP and NPN transistors.	BL1	CO4	[1M]
8.c)	What is the use of a Rectifier?	BL1	CO5	[1M]
8.d)	What is the use of an Amplifier?	BL1	CO5	[1M]
8.e)	List the types of number systems in digital electronics.	BL1	CO6	[1M]

SECTION –B **3 X 10 = 30**

	UNIT-IV			
9.a)	What is a PN junction diode? Explain the working of PN junction diode in both forward bias and in reverse bias and also draw the V-I characteristics.	BL2	CO4	[10M]
	(OR)			
10.a)	What is Zener diode and draw and explain the characteristics.	BL2	CO4	[5M]
b)	Explain about CE configuration and draw the characteristics.	BL2	CO4	[5M]
	UNIT-V			
11.a)	Draw the block diagram of DC power supply and explain briefly.	BL3	CO5	[5M]
b)	Explain about RC coupled amplifier with neat circuit diagram.	BL2	CO5	[5M]
	(OR)			
12.a)	Explain about Full Bridge rectifier with neat circuit diagram and draw the waveforms. And also derive the expressions for average value, RMS value and Ripple factor.	BL2	CO5	[10M]
	UNIT-VI			
13.a)	What are logic gates? Explain about different logic gates giving their graphic symbols and truth tables.	BL2	CO6	[10M]
	(OR)			
14.a)	State the laws of Boolean algebra.	BL2	CO6	[5M]
b)	Write a short note on i) Half adder. ii) Full adder.	BL2	CO6	[5M]

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Course Code: **23CE2T01**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE: ODALAREVU
(AUTONOMOUS)

I B.Tech II Semester Regular / Supplementary Examinations (BR23), JUNE-2025

ENGINEERING MECHANICS
(Common to CE & ME)

Time: 3 hours | Max. Marks: 70

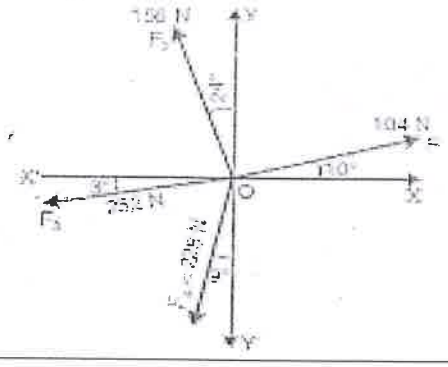
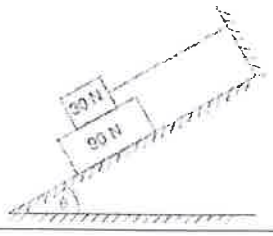
Question Paper consists of Part-A and Part-B
Answer ALL the questions of Part-A
Part-B consists of 5 questions with either/or choice, answer any one from either/or choice

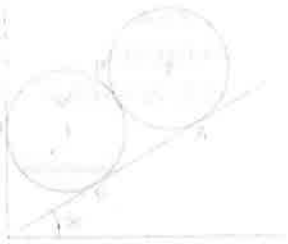
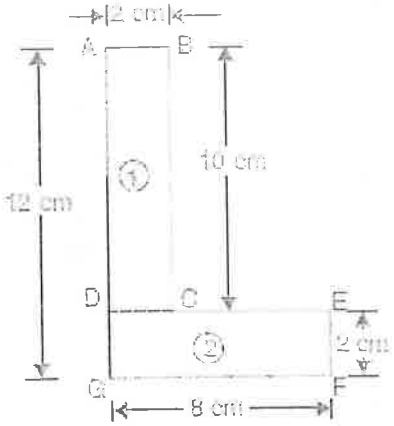
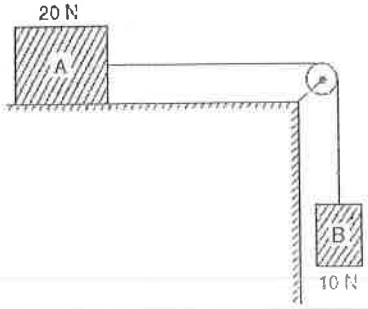
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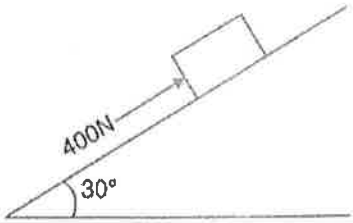
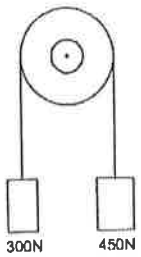
PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	What are the Characteristics of Force	BL01	1	(2M)
b)	Define coefficient of friction?	BL01	1	(2M)
c)	State and explain the Triangle Law of Forces	BL01	2	(2M)
d)	Define Lamis Theorem?	BL01	2	(2M)
e)	Define Pappus Theorem I & II	BL01	3	(2M)
f)	Define perpendicular Axis theorem?	BL01	3	(2M)
g)	Define linear motion	BL01	4	(2M)
h)	Write the formula for Range of Projectile motion	BL01	4	(2M)
i)	Define work	BL01	5	(2M)
j)	Define Kinematics	BL01	5	(2M)

PART–B (5X10 = 50M)

	UNIT-I			
2.	The four coplanar forces are acting at a point as shown in Fig. Determine the resultant in magnitude and direction. 	BL02	1	(10M)
	(OR)			
3.	What should be the value of the angle θ in Fig. so that the motion of the 90 N block impends down the plane? The co-efficient of friction μ for all the surfaces is 1/3. 	BL03	1	(10M)

4.	Two identical rollers, each of weight 450 N, are supported by an inclined plane and a vertical wall as shown in Fig. Assuming smooth surfaces, find the reactions induced at the points of support A, C and D. 	BL03	2	(10M)
	(OR)			
5.	Explain the following i) Free Body Diagram ii) Equilibrium conditions	BL02	2	(10M)
	UNIT-III			
6.	Find the center of gravity of the L-section shown in Fig. 	BL03	3	(10M)
	(OR)			
7.	Define and derive the parallel axis theorem?	BL02	3	(10M)
	UNIT-IV			
8.	A particle moves along a straight line so that its displacement in metre from a fixed point is given by, $s = t^3 + 3t^2 + 4t + 5$. Find: (i) Velocity at start and after 4 seconds (ii) Accclcration at start and aftcr 4 scconds	BL03	4	(10M)
	(OR)			
9.	Two blocks shown in Fig. have weights A = 20 N and B = 10 N and co-efficient of friction between the block A and the horizontal plane is $\mu = 0.25$. If the system is released from the rest and the block B falls through a vertical distance of 2 m, what is the velocity attained by block B? Neglect the friction in the pulley and the extension of the string. 	BL03	4	(10M)

	UNIT-V			
10.	A body weighing 300 N is pushed up a 30° plane by a 400 N force acting parallel to the plane as shown in Fig. If the initial velocity of the body is 1.5 m/s and the coefficient of kinetic friction is 0.2, find the velocity after travelling 6 m distance.  	BL03	5	(10M)
	(OR)			
11	Two bodies weighing 300 N and 450 N are hung to the ends of a rope passing over an ideal pulley as shown in Fig. How much distance the blocks will move in increasing the velocity of system from 2m/ sec to 4m/sec? How much is the tension in the string? Use work energy method.  	BL03	5	(10M)

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BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE:: ODALAREVU
(AUTONOMOUS)

I B.Tech II Semester Regular/Supplementary Examinations (BR23), JUNE-2025
ELECTRICAL CIRCUITS (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)

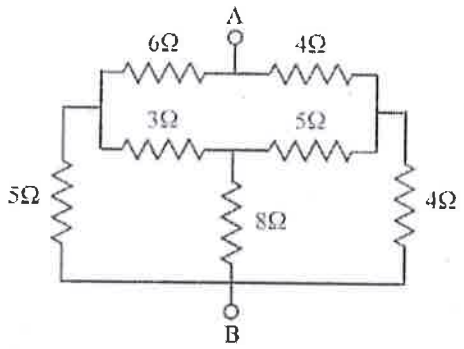
		CO	BL	M
1.a)	Define node and branch of a network and give examples.	1	1	2
b)	What are dependent sources and give their classification.	1	1	2
c)	Draw the power triangle diagram of a series RL circuit.	2	2	2
d)	What is the RMS value of a square wave?	2	4	2
e)	State Faraday's law of electromagnetic induction.	3	1	2
f)	What are the limits of coefficient of coupling	3	2	2
g)	What is the power factor of a parallel resonant circuit at resonance.	4	2	2
h)	Determine the quality factor of a series resonant circuit having having resonant frequency as 10 rad/sec and band width as 0.4 rad/ sec.	4	3	2
i)	State the maximum power transfer theorem.	5	1	2
j)	What are the statements of Thevenin's theorem.	5	2	2

PART–B (5X10 = 50M)

		CO	BL	M

UNIT-I

2.a) Determine the resistance between the points A and B in the network shown in Fig — CO 1, BL 3, M 5

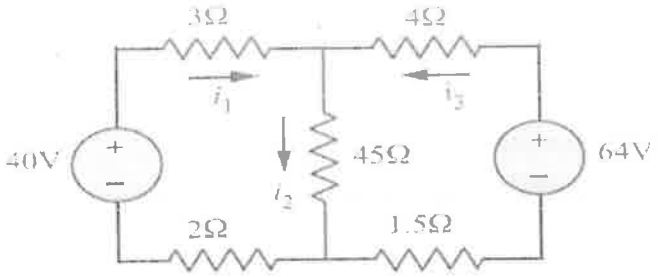


2.b) Discuss the source transformation technique with neat diagrams. — CO 1, BL 2, M 5

OR

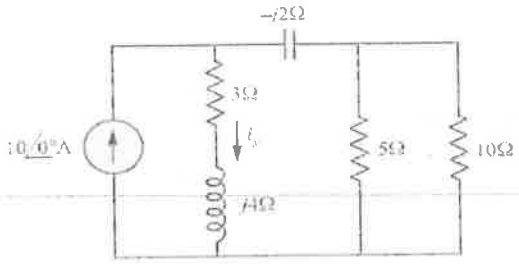
2, 5, 7, 8, 9, 10

circuit shown in Fig.



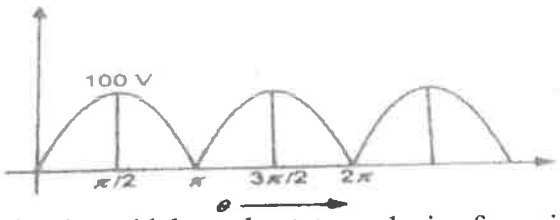
UNIT-II

4.) Find the current i_x using nodal analysis — 2 3 10



OR

5.a) Find the average value of the voltage wave shown in figure: — 2 3 5



5.b) Discuss the sinusoidal steady state analysis of a series RC circuit and draw the phasor diagram. — 2 2 5

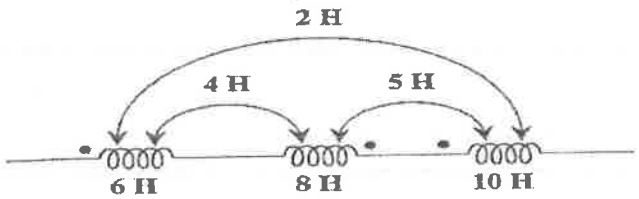
UNIT-III

6. Derive an expression for coefficient of coupling in terms of self and mutual inductances. — 3 2 10

OR

7.a) State dot convention and explain about it's application in electrical circuits. — 3 2 5

7.b) Determine the total inductance of the coupled coils shown in figure. — 3 3 5



UNIT-IV

8.a) In a series RLC circuit, the resonant frequency is found to be 1 kHz. If the capacitance is 0.1 μF, Find the value of the inductance in mH. — 4 3 5

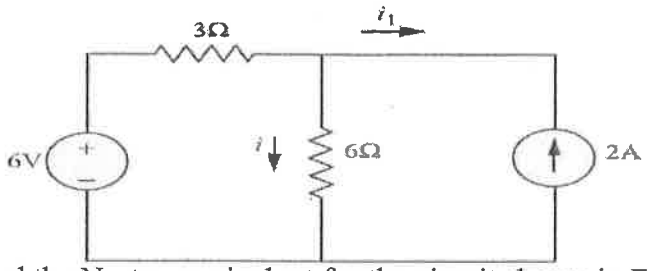
8.b) List the properties of series resonant circuit. — 4 2 5

OR

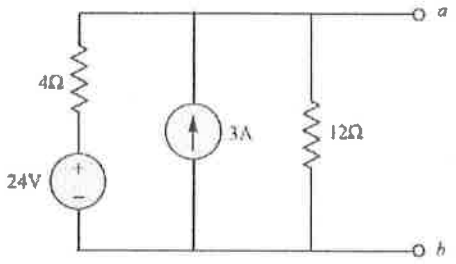
9.a)	Draw the current locus diagram of a series RL circuit, with 'R' variable	4	2	5
9.b)	Write a short notes on series resonance.	4	1	5

UNIT-V

10.a)	Find the current in the 6 Ω resistor using the principle of superposition for the circuit of Fig	5	3	5



10.b)	Find the Norton equivalent for the circuit shown in Fig. at the terminals a-b	5	3	5



OR

11.)	State and prove maximum power transfer theorem for circuits with DC excitation.	5	2	10

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Course Code: **23EE2T02**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE:: ODALAREVU
(AUTONOMOUS)

I B.Tech II Semester Regular / Supplementary Examinations (BR23), JUNE-2025

NETWORK ANALYSIS (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

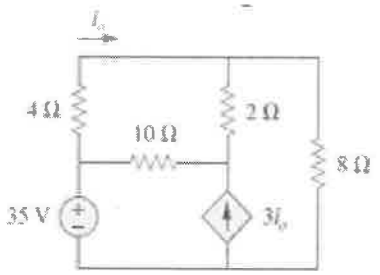
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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	Compare mesh and nodal analysis?	BTL1	1	(2M)
b)	State Norton's theorem?	BTL1	1	(2M)
c)	Define phase angle and its significance?	BTL2	2	(2M)
d)	What is a purely inductive AC circuit?	BTL2	2	(2M)
e)	State the initial value theorem?	BTL1	3	(2M)
f)	Define Laplace Transform?	BTL1	3	(2M)
g)	What is the coefficient of coupling?	BTL2	4	(2M)
h)	Define mutual inductance.	BTL1	4	(2M)
i)	Write voltage and current equations for Z-parameters?	BTL3	5	(2M)
j)	What is the significance of parameter conversion?	BTL3	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	Use mesh analysis to find current i_o in the figure	BTL3	1	(10M)



(OR)

3.(a)	Explain Thevinins theorem with an example.	BTL3	1	(5M)
3.(b)	Derive the condition for maximum power transfer in DC circuits.	BTL4	1	(5M)

3, 4, 7, 8, 11

UNIT-II

4.(a)	Define and explain the concept of resonance in R-L-C circuits.	BTL2	2	(5M)
4.(b)	A series RL circuit with R=15Ω ,and L=0.02 Henry is connected to a 210 V,50Hz source. Calculate (i)The impedance (ii) The current	BTL3	2	(5M)
	(OR)			
5.	A 100V, 50Hz supply is connected to a series R-L circuit. R = 10Ω, L = 0.1H.Calculate current, phase angle, impedance?	BTL4	2	(10M)

UNIT-III

6.	Discuss the solution for current of R-L circuit using Laplace approaches?	BTL4	3	(10M)
	(OR)			
7.(a)	Find the Laplace transform of $f(t)=te^{-2t}$?	BTL3	3	(5M)
7.(b)	Solve an R-C circuit excited by a step input using the laplace equation method?	BTL3	3	(5M)

UNIT-IV

8.(a)	Explain the dot convention with an example and determine polarity?	BTL4	4	(5M)
8.(b)	Explain the significance of the quality factor (Q) and its relation with bandwidth?	BTL2	4	(5M)
	(OR)			
9.	Define self and mutual inductance and derive coefficient of coupling(K).	BTL4	4	(10M)

UNIT-V

10.	Derive the conditions under which a two-port network becomes reciprocal and symmetric for each parameter set (Z, Y, h, ABCD)?	BTL4	5	(10M)
	(OR)			
11(a)	Determine the equivalent Z-Parameters for a series two port network.	BTL3	5	(5M)
11(b)	Derive the Z-parameters in terms of Y- parameters.	BTL4	5	(5M)

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BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE: ODALAREVU
(AUTONOMOUS)

I B.Tech II Semester Regular / Supplementary Examinations (BR23), JUNE-2025

COMMUNICATIVE ENGLISH

(CSE, CSE (AIDS), AIML, CSE (AIML)) IT

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)	Who were the Youngs and what were the two possessions that they were proud of?	1	1	(2M)
b)	Frame "Wh"- questions for the following statements: i) My mother goes for a walk every day. ii) Paris is the capital of France.	2	1	(2M)
c)	Fill in the blanks with correct prepositions: i)This shop doesn't have the books we were looking __. (up/for) ii) The governess distributed chocolates ____ the two brothers. (between/among)	2	2	(2M)
d)	Write the difference between the words in the given sets of Homophones: Break, Brake	2	2	(2M)
e)	Define collocation with suitable examples.	2	3	(2M)
f)	Identify the tense of the sentence: He <u>will have</u> a problem in future.	1	3	(2M)
g)	Name the author of 'Toys of Peace'	1	4	(2M)
h)	Write two useful expressions for asking information.	1	4	(2M)
i)	Define Intrapersonal Communication?	1	5	(2M)
j)	Identify the correct sentence: i) I am Dravid ii) Me Dravid	2	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	Do you think the title of the story "The Gift of the Magi" is appropriate? Justify.	1	1	(10M)
	(OR)			
3.(a)	Explain the differences between Skimming and Scanning.	3	1	(5M)
3.(b)	Identify the underlined parts of speech in the following sentences: i) My <u>sister</u> lives <u>in</u> <u>England</u>. ii) <u>She</u> works for a research <u>laboratory</u>.	2	1	(5M)
	UNIT-II			
4.(a)	Explain the lines 'For men may come, and men may go, But I go on forever'. What does it say about nature?	1	2	(5M)
4.(b)	Fill in the blanks with appropriate articles: (an, a, the) i) Sheldon is ___ honest man. ii) They have fixed ___ appointment with ___ doctor. iii) Will you take ___ picture of us? iv) I broke ___ vase my brother brought.	2	2	(5M)
	(OR)			
5.	Construct a paragraph on "The role of cybersecurity in the digital age".	3	2	(10M)

3, 4, 7, 8, 11

UNIT-III

6.	What is SpaceX and what has been its impact on space exploration?	1	3	(10M)
	(OR)			
7.(a)	Choose the correct form of the verb that agrees with the subject: i) Annie and her brothers (is, are) at school. ii) Either my mother or my father (is, are) coming to the meeting. iii) The dog and the cats (is, are) outside. iv) Neither my shoes nor your coat (is, are) on the floor. v) George and Tamara (doesn't, don't) want to see that movie.	2	3	(5M)
7.(b)	Explain different types of note-making techniques used to take notes.	3	3	(5M)

UNIT-IV

8.(a)	Choose the correct word from the pair given in brackets to complete each sentence: i) The committee will soon _____ (accept / except) the new policy on data usage. ii) She was greatly _____ (affected / effected) by the news of her friend's promotion. iii)The engineer was asked to _____ (advise / advice) on the structural changes. iv)He has a good _____ (sense / censor) of humor. v) Please _____ (ensure / insure) that the machine is turned off after use.	2	4	(5M)
8.(b)	What instincts and tendencies did Harvey think would be difficult to change Children mind?	1	4	(5M)
	(OR)			
9.	You have completed your undergraduate studies and require a transfer certificate in order to apply for a postgraduate course. Compose a letter to your principal requesting the necessary certificate.	3	4	(10M)

UNIT-V

10.	Write an Essay on " The Toys of peace" by Saki.	4	5	(10M)
	(OR)			
11(a)	Correct errors in the following sentences: i) He is senior than me in this company. ii) I prefer coffee than tea. iii) Neither of the answers are correct. iv) The book is belonging to my friend. v) He went to the market for buying vegetables.	2	5	(5M)
11(b)	Differentiate between Interpersonal & Intrapersonal communication. How does interpersonal communication help us to overcome challenges?	1	5	(5M)

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Course Code: **23CS2T01**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)

I B.Tech II Semester Regular / Supplementary Examinations (BR23), JUNE-2025

DATA STRUCTURES

(Common to CSE, IT, 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)

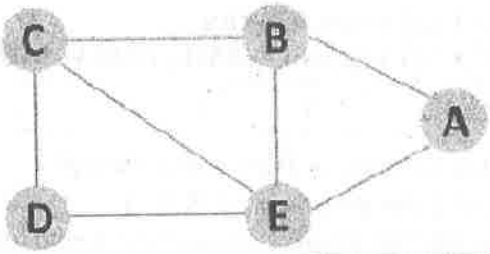
		BTL	CO	Marks
1.a)	Explain the difference between a linear and a non-linear data structure.	1	1	(2M)
b)	How to calculate time complexity of a program?	2	1	(2M)
c)	What are push and pop operations in a stack?	1	2	(2M)
d)	What is backtracking?	1	2	(2M)
e)	Operations of queue using array.	2	3	(2M)
f)	How is a double-ended Queues different from regular queues?	2	3	(2M)
g)	What is difference between Array and Linked List?	1	4	(2M)
h)	List the applications of Linked Lists.	1	4	(2M)
i)	Define the terms i) Tree and ii) Binary Tree.	1	5	(2M)
j)	Define hashing and what is a hash function?	1	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	Write a mechanism for Bubble sort. Perform bubble sort for the following elements: 23, 56, 14, 34, 58, 97, 72, 69, 36	3	1	(10M)
	(OR)			
3.	Give a mechanism for Quick Sort and trace the steps for sorting the following list, and derive the time complexity. 65, 70, 75, 80, 85, 60, 55, 50, 45	3	1	(10M)
	UNIT-II			
4.(a)	Write a mechanism and implementing of stacks using Arrays. Explain with an example.	3	2	(5M)
4.(b)	Explain the stack applications with any two example.	3	2	(5M)
	(OR)			
5.	Describe Infix, Prefix, and Postfix of an expression. Convert the given Infix expression to postfix expression using the stack algorithm and show the stack details at each conversion step. ((A +B)^C – (D *E)/F	4	2	(10M)

4.7.8

UNIT-III

6.	Write an algorithm to traverse the graph using breadth first search (BFS). Illustrate the BFS traversal for the given graph in, Fig., using Queues. 	4	3	(10M)
	(OR)			
7.(a)	Explain the implementation of Priority queue. Write an algorithm for operations on Priority queues with an example.	3	3	(5M)
7.(b)	Explain the working of Double ended queue (deque) with an example.	3	3	(5M)

UNIT-IV

8.	With neat diagrams, explain the following operations in Singly Linked List data structure. i) Insert element at the beginning ii) Insert element at the end iii) Delete the specified element	3	4	(10M)
	(OR)			
9.(a)	Explain the linked list application of merging of two linked list with an example.	3	4	(5M)
9.(b)	Write an algorithm for inserting a node in the middle of the Doubly linked-list.	3	4	(5M)

UNIT-V

10.	Outline the Binary Search Tree concept and write a mechanism to search an element in the Binary Search Tree. create a Binary Search Tree using following data: 45, 39, 56, 12, 34, 78, 32, 10, 89, 54, 67, 81	4	5	(10M)
	(OR)			
11.	Explain about graph representations and binary tree traversal's.	3	5	(10M)

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Course Code: [23ES2103]

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE: ODALAREVU
(AUTONOMOUS)

I B.Tech II Semester Regular End Examinations (BR23)- June 2025 F/N

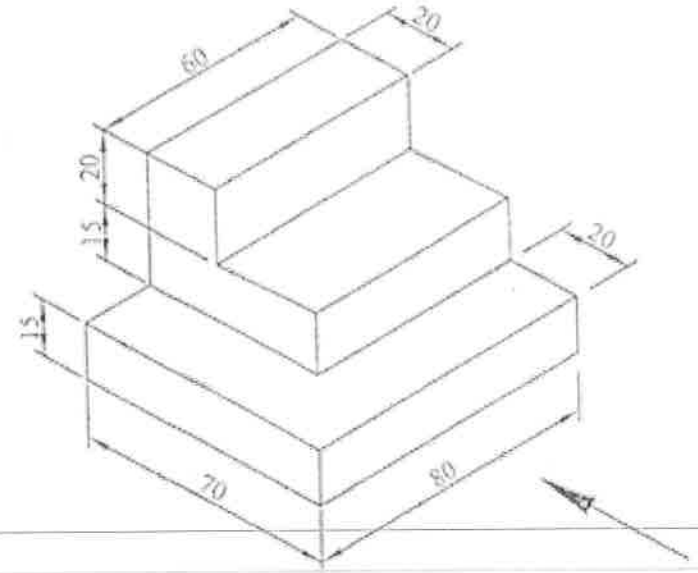
ENGINEERING GRAPHICS (CE, EEE)

Duration: 3 hours Max. Marks: 70

Paper consists of five questions. Each question has an internal choice, and either of them can be answered

All Questions carry Equal Marks

		BTL	CO	Marks
	UNIT-I			
1.(a)	Construct an ellipse when the distance of the focus from the directrix is equal to 50 mm and eccentricity is 2/3. Also, Draw a tangent and normal to the ellipse at a point 70 mm away from the directrix.	**3**	1	(14M)
	(OR)			
1.(c)	Construct a diagonal scale of RF = 1/6250 to read up to 1 km and to read meters on it. Show a length of 674 m on the scale	**3**	1	(7M)
1.(d)	Draw an Involute of an Equilateral Triangle with a side length of 35 mm.	**2**	1	(7M)
	UNIT-II			
2.(a)	A 80 mm long line PQ has end P 20 mm above H.P. and 40 mm in front of the V.P. The line is inclined at 30° to the H.P. and is parallel to the V.P. Draw the projections of the line	2	2	(7M)
2.(b)	A 70 mm long line PQ, has its end P 20 mm above the H.P. and 30 mm in front of the V.P. The line is inclined at 45° to the H.P. and 30° to the V.P. Draw its projections.	3	2	(7M)
	(OR)			
2.(c)	A rectangle ABCD of size 40×25 mm, has the corner A, 10mm above HP and 15mm in front of VP. All the sides of the rectangle are equally inclined to H.P. And parallel to V.P. Draw its projections.	3	2	(14M)
	UNIT-III			
3.(a)	A pentagonal prism of base edge 30 mm and axis 60 mm rests on an edge of its base in the H.P. Its axis is parallel to V.P. and inclined at 45° to the H.P. Draw its projections	3	3	(14M)
	(OR)			
3.(c)	A pentagonal prism of base side 30 mm and axis 60 mm has one of its bases in the V.P. Draw its projections when a rectangular face is parallel to and 15 mm above the H.P	3	3	(14M)
	UNIT-IV			
4.(a)	A cone, base 75 mm diameter and axis 80 mm long is resting on its base on the HP. It is cut by a section plane perpendicular to the VP. Inclined at 45^0 to the HP, and cutting the axis at a point 35 mm from the apex. Draw its front view, sectional top view, and true shape of the section.	3	4	(14M)

4.(c)	A pentagonal prism of base side 30 mm and axis 70 mm is resting on its base on the H.P. with a rectangular face parallel to the V.P. It is cut by an auxiliary inclined plane (A.I.P.) whose V.T. is inclined at 45° to the reference line and passes through the mid-point of the axis. Draw the development of the lateral surface of the truncated prism	3	4	(14M)
	UNIT-V			
5.(a)	Draw the Front View, Top View and Side View of the Following Figure.  	4	5	(14M)
	(OR)			
5(c)	Draw an isometric view of a cylinder, with a 50mm base diameter and a 70mm long axis when one of the generators is on the HP?	3	5	(7M)
5(d)	Draw the isometric view of a Hexagon with 40mm side such that its surface is Parallel to the HP and a side Parallel to the VP?	3	5	(7M)

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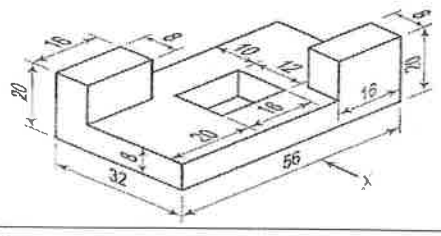
BONAM VENKATA CHALAMAIYA ENGINEERING COLLEGE: ODALAREVU
(AUTONOMOUS)

I B.Tech II Semester Regular End Examinations (BR23)- June 2025

ENGINEERING GRAPHICS (ECE) [A.N]

Duration: 3 hours | Max. Marks: 70

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

	UNIT-I	
1.a)	Construct an ellipse when the distance of the focus from the directrix is equal to 50 mm and the eccentricity is 2/3.	(7M)
1.b)	Construct a plane scale of RF=1:4 to show centimetres and decimetres long enough to measure up to 5 decimetres show a distance of 2.7 dm.	(7M)
	(OR)	
1.c)	Construct a cycloid, given that the diameter of the generating circle is 60 mm. Draw a normal and a tangent at any point on the Cycloid.	(14M)
	UNIT-II	
2.a)	Draw the projections of the following points on the same ground line, keeping the projectors 25 mm apart. i)A, in the H.P., and 20 mm behind the V.P. ii) B, 40 mm above the H.P. and 25 mm in front of the V.P. iii) C, in the V.P. and 40 mm above the H.P. iv) D,25 mm below the H.P. and 25 mm behind the V.P. v) E, 15 mm above the H.P. and 50 mm behind the V.P. vi) F, 40 mm below the H.P. and 25 mm in front of the V.P. vii) G, in both the H.P. and the V.P.	(14M)
	(OR)	
2.c)	A 100 mm long line is parallel to and 40 mm above the H.P. Its two ends are 25 mm and 50 mm in front of the V.P., respectively. Draw its projections and find its inclination with the V.P.	(7M)
2.d)	A square ABCD of 40 mm side has a corner on the H.P. and 20 mm in front of the V.P. All the sides of the square are equally inclined to the H.P. and parallel to the V.P. Draw its projections.	(7M)
	UNIT-III	
3.a)	Draw the projections of a pentagonal prism, base 25 mm side and axis 50 mm long,resting on one of its rectangular faces on the H.P., with the axis inclined at 45^0 to the V.P.	(14M)
	(OR)	
3.c)	A square prism, base on the H.P., a side of the base inclined at 30° to the V.P., and the axis 50 mm in front of the V.P. The side of the base is 40 mm, and the axis is 65 mm long.	(7M)
3.d)	A cylinder, axis perpendicular to the V.P. and 40 mm above the H.P., one end 20 mm in front of the V.P. The diameter of the base is 50 mm, and the axis is 65 mm long.	(7M)
	UNIT-IV	
4.a)	A cube of 35 mm long edges is resting on the H.P.on one of its faces with a vertical face inclined at 30° to the V.P. It is cut by a section plane parallel to the V.P. and 9 mm away from the axis and further away from the V.P. Draw its sectional front view and the top view.	(14M)
	(OR)	
4.c)	Draw the development of the lateral surfaces of a right square prism of edge of base 40 mm and axis 60 mm long.	(14M)
	UNIT-V	
5.a)	Draw the front view, top view, and side view of the object as shown in the figure below. 	(14M)
	(OR)	
5.c)	Draw the isometric view of a cone, base 40 mm diameter and axis 55 mm long (i) when its axis is vertical and (ii) when its axis is horizontal.	(14M)

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Course Code: [23ES2T03]

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)

I B.Tech II Semester Regular/Supplementary Examinations (BR23) JUNE-2025.

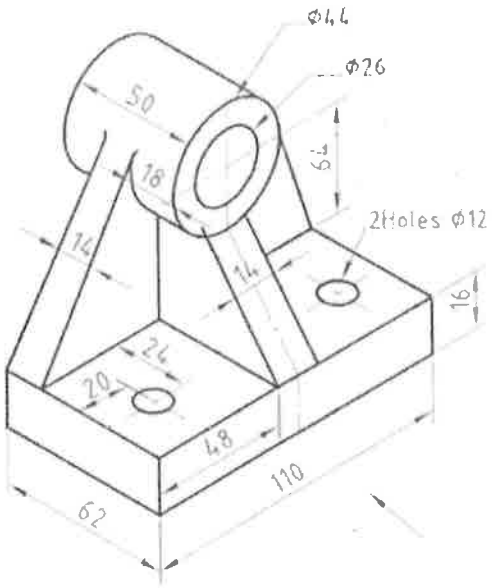
ENGINEERING GRAPHICS (Common to CE, EEE, ME & ECE)

Duration: 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)	Construct an ellipse when its major axis is 120mm and the distance between the foci is 108 mm. Determine the length of the minor axis.	(14M)
	(OR)	
1.c)	A coin of 35 mm diameter rolls over dining table without slipping. A point on the circumference of the coin is in contact with the table surface in the beginning and after one completer revolution. Draw the curve traced by the point. Draw a tangent and normal at any point on the curve.	(14M)
	UNIT-II	
2.a)	A point S is on both HP and VP. Another point T is 35mm above HP and 40 mm in front of VP. Draw its projections when the line joining their top view is 70mm. Also draw and measure the line joining their front views.	(7M)
b)	A 75 mm long line PQ has its end P 15 mm from both H.P. and V.P. The other end Q is 35 mm above H.P. and 45 mm in front of V.P. Draw the projections of the line and determine the inclinations with H.P. and V.P.	(7M)
	(OR)	
2.c)	A line AB 120mm long is inclined at 45^0 to the H.P. and 30^0 to the V.P. Its midpoint C is in V.P. and 20mm above H.P. The end A is in the third quadrant and B is in the first quadrant. Draw the projections of the line.	(14M)
	UNIT-III	
3.a)	A circular lamina of 60mm diameter rests on HP on a point on the circumference. The lamina is inclined to HP such that the top view of it is an ellipse of minor axis 35mm. The top view of the diameter through that point makes an angle of 45° with VP. (i) Draw the projections. (ii) Determine the angle made by the lamina with the HP.	(14M)
	(OR)	
3.c)	Draw the projections of a circle of 40 mm diameter, resting on HP on a point on the circumference. Its plane is inclined at 30^0 to the HP. and perpendicular to the VP. Its centre is 35mm in front of the VP.	(7M)
d)	A regular pentagon ABCDE of side 30mm is parallel to the VP. The side AB is perpendicular to the HP. Draw the projections of the pentagon.	(7M)
	UNIT-IV	
4.a)	A pentagonal prism 25mm side of base and 60mm axis length rests on HP on one of its edges of the base which is inclined at VP at 30^0. Draw the projections of the prism when the axis is inclined to HP at 40^0.	(14M)
	(OR)	

4.c)	A hexagonal prism, base 30 mm side and axis 75 mm long, has an edge of the base parallel to the H.P. and inclined at 45° to the V.P. Its axis makes an angle of 60° with the H.P. Draw its projections.	(14M)
	UNIT-V	
5.a)	Draw the front view, top view and side view of object as shown in fig. below? 	(14M)
	(OR)	
5.c)	Draw the isometric view of a cylinder with 40 mm base diameter and a 70 mm long axis when one of the generators is on the H.P.	(14M)

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