Course Code: **23BS3T05**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)

II B.Tech I Semester Regular End Examinations (BR23), November 2024

NUMERICAL TECHNIQUES AND STATISTICAL METHODS (CE)

Time: 3 hours Max. Marks: 70

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

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	Write the formula for iteration method?	1	1	(2M)
b)	Evaluate $\Delta(tan^{-1}x)$.	3	1	(2M)
c)	Write the formula for Trapezoidal rule.	1	2	(2M)
d)	Write the formula for Taylor's series method.	1	2	(2M)
e)	Find the mean of a random variable having the standard normal distribution will take on a value between 0.87 and 1.28.	3	3	(2M)
f)	Write the recurrence formula for binomial distribution.	2	3	(2M)
g)	Define unbiased estimation.	2	4	(2M)
h)	Write the formula for confidence limits of true single mean.	1	4	(2M)
i)	Define Null Hypothesis.	1	5	(2M)
j)	Write any two applications of Chi-Square Distribution.	2	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	Using Newton's iteration method, Find the real root of the equation $x\ log_{10}x = 1.2$ correct to five decimal places.	3	1	(10M)
	(OR)			
3.	Using Newton's Backward formula Compute f(84) from the following table and fit a polynomial.	3	1	(10M)

x	40	50	60	70	80	90
f(x)	184	204	226	250	276	304

	UNIT-II					
4.(a)	Evaluate $\int_0^6 \frac{1}{1+x}dx$ by using (1) Simpson's 1/3 rd rule	3	2	(5M)		
4.(b)	Solve $y^l = x - y^2; y(0) = 1$ using Taylor's series Method and Compute $y(0.1)$	3	2	(5M)		

(OR)

5.(a)	Use Trapezoidal rule to estimate the integral $\int_0^2 e^{x^2}\,dx$ taking 10 intervals.	3	2	(5M)
5.(b)	Given that $y^l = x + y^2\,; y(0) = 1$ $find\ y(0.2)$ using Runge Kutta Method take h =0.1	3	2	(5M)

UNIT-III

6.	If x is a random variable having probability density function $f(x) = \begin{cases} \frac{1}{2}(x+1); -1 < x < 1 \\ 0; \quad Elsewhere \end{cases}$ Compute mean and variance.	2	3	(10M)

(OR)

7.	In a Normal distribution, 7% of the items are under 35 and 89% are under 63 Compute the Mean and variance of distribution.	3	3	(10M)

UNIT-IV

8.(a)	A random sample of size 81 was taken whose variance is 20.25 and means is 32, construct 98% confidence interval	3	4	(5M)
8.(b)	A population consists of 5,10,14,18, consider all possible samples of size two which can be drawn without replacement from the population. Find (1) The mean of the sampling distribution of means (2) The standard deviation of sampling distribution of means	3	4	(5M)

(OR)

9.(a)	The mean of certain normal population is equal to the standard error of the mean of the samples of 64 from that distribution. Find the probability that the mean of the sample size 36 will be negative	3	4	(5M)
9.(b)	Determine the probability that $\bar{X}$ will be between 22.39 and 22.41 if a random sample of size 36 is taken from an infinite population having the mean $\mu = 22.4$,$\sigma = 0.048$.	3	4	(5M)

UNIT-V

10.	In a random sample of 600 cars making a right turn at a certain intersection, 157 pulled into wrong lane. Test the null hypothesis that actually 30% of all drivers make this mistake at the given intersection, using the alternative hypothesis $p \neq 0.30$ and the level of significance $\alpha = 0.05$.	4	5	(10M)

(OR)

11.	The following random samples are measurements of the heat producing capacity (in millions of calories per ton) of specimens of coal from two mines:	4	5	(10M)

Mine 1:	8,260	8,130	8,350	8,070	8,340	-
Mine 2:	7,950	7,890	7,900	8,140	7,920	7,840

Use the 0.01 level of significance to test whether the difference between the means of these two samples is significant.

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Course Code: **23HM3T02**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE: ODALAREVU
(AUTONOMOUS)

II B.Tech I Semester Regular End Examinations (BR23), November 2024
Universal Human Values - Understanding Harmony and Ethical Human Conduct
(Common for 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	Mark
1.a)	Explain the process of value education.	1	1	(2M)
b)	What should be the content of value education to make it complete? How do values relate to our day to day living?	1	1	(2M)
c)	Define Pre-Conditioning.	2	2	(2M)
d)	What do you mean by Imagination?	2	2	(2M)
e)	Define trust. Or How is 'trust' the foundation value of relationships?	3	3	(2M)
f)	Define 'affection' or How does affection lead to harmony in the family?	3	3	(2M)
g)	What does 'Knowledge of self (I)' means?	4	4	(2M)
h)	What is sanskaar? Explain its effects or the conformance of the human order.	4	4	(2M)
i)	What is ethical human conduct?	5	5	(2M)
j)	Define Human conduct.	5	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Mark
	UNIT-I			
2.	How does value education helps in fulfilling ones aspirations.	1	1	(10M)
	(OR)			
3.	What would be the consequences if technology is used without taking human Values into consideration?	1	1	(10M)
	UNIT-II			
4.(a)	'Human being is co-existence of the Self and the Body' – elaborate on this statement.	2	2	(5M)
4.(b)	Explain distinguishing between the needs of the self and body.	2	2	(5M)
	(OR)			
5.(a)	How can you say that the activities in 'I' are continuous?	2	2	(5M)
5.(b)	"I am the seer, doer and enjoyer. The body is my instrument" – Explain.	2	2	(5M)
	UNIT-III			
6.	Explain the problems faced due to differentiation in relationship.	3	3	(10M)
	(OR)			
7.	Discuss vision for the Universal human order	3	3	(10M)

	UNIT-IV			
8.(a)	What are the four orders in nature? How are they inter-dependent and mutually fulfilling for each other? Explain.	4	4	(5M)
8.(b)	What do you mean by 'innateness'? What is the innateness in the four orders?	4	4	(5M)
	(OR)			
9.(a)	Explain the swabhav of human order and how it helps in living with harmony.	4	4	(5M)
9.(b)	Define harmony in nature and why is it important. Explain with examples.	4	4	(5M)
	UNIT-V			
10.	What do you understand by definitiveness of ethical human conduct? Why is this definitiveness desirable?	5	5	(10M)
	(OR)			
11.	What do you understand by holistic technology? Briefly explain.	5	5	(10M)

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Course Code: **23ES3T05**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)

II B.Tech I Semester Regular End Examinations (BR23), November 2024

SURVEYING (CE)

Time: 3 hours Max. Marks: 70

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

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	Define surveying.	BL3	1	(2M)
b)	What are the advantages of plane table surveying?	BL4	1	(2M)
c)	What are the uses of contour?	BL4	2	(2M)
d)	List the various methods used for measurement of Area.	BL1	2	(2M)
e)	What do you mean by transit theodolite?	BL4	3	(2M)
f)	Define face left condition.	BL3	3	(2M)
g)	Define a simple circular curve.	BL3	4	(2M)
h)	What is GPS?	BL4	4	(2M)
i)	What is mean by aerial photogrammetry?	BL4	5	(2M)
j)	Define stereoscopy.	BL3	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.(a)	Differentiate between Prismatic compass and Surveyor's compass.	BL1	1	(5M)
2.(b)	Write short notes on Chains, Tapes corrections.	BL1	1	(5M)
	(OR)			
3.(a)	A 20 m chain was found to be 15 cm too long after chaining a distance of 1600 m. It was found to be 30 cm too long at the end of the day's work after chaining a total distance of 3200 m. Determine the correct distance if the chain was correct before the commencement of the work.	BL6	1	(5M)
3.(b)	The following bearings were observed with a compass: Where do you suspect the local attraction? Find the correct bearings	BL6	1	(5M)

Line	FB	BB
AB	$150^0 0^0$	$329^0 45^0$
BC	$77^0 30^0$	$256^0 0^0$
CD	$41^0 30^0$	$222^0 45^0$
DE	$314^0 15^0$	$134^0 45^0$
EA	$220^0 15^0$	$40^0 15^0$

	UNIT-II			
4.	What are the various characteristics of contours explain with the help of neat sketches.	BL4	2	(10M)
	(OR)			

5.	The following offsets were taken from a chain line to a hedge:										BL6	2	(10M)

Distance in m	0	20	40	60	80	120	160	200	240	270
Offsets in m	24.2	16	12	8	10	14	16	20	22	26

Calculate the area enclosed between the chain line, the hedge and the end offsets by trapezoidal rule, Simpson's rule.

UNIT-III

6.(a)	What are the temporary adjustments of theodolite?	BL3	3	(5M)
(b)	Describe the repetition method of measurement of Horizontal angle.			(5M)

(OR)

7.(a)	Differentiate between i) face left and face right readings. ii) Transiting and swinging of telescope.	BL1	3	(5M)
7.(b)	The following lengths and bearings were recorded in running a Theodolite traverse in the counter clockwise direction, the length of CD and bearing of DE having been omitted	BL6	3	(5M)

Line	Length in m.	R.B
AB	281.4	S 69^0 11′ E
BC	129.4	N 21^0 49′ E
CD	?	N 19^0 34′ W
DE	144.5	?
EA	168.7	S 74^0 24′ W

Determine the length of CD and the bearing of DE.

UNIT-IV

8.	Write the difference between simple curves, compound curves and transition Curves.	BL1	4	(10M)

(OR)

9.	A circular curve has 200m radius and 65^o deflection angle with a chainage of two intersection straight lines is 1189.61m, calculate the following (i) Length of curve (ii) Length of long chord (iii) Tangent distance (iv) Apex distance (v) mid-ordinate distance.	BL6	4	(10M)

UNIT-V

10(a)	Explain detail the Aerial photogrammetry.	BL3	5	(5M)
10(b)	Write about the various Terrestrial Photogrammetry.	BL1	5	(5M)

(OR)

11(a)	What is photogrammetry? Explain merits and demerits.	BL4	5	(5M)
11(b)	Explain bout Radial triangulation and stereoscopy.	BL3	5	(5M)

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Course Code: **23CE3T02**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)

II B.Tech I Semester Regular End Examinations (BR23), November 2024

STRENGTH OF MATERIALS (CE)

Time: 3 hours | Max. Marks: 70

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

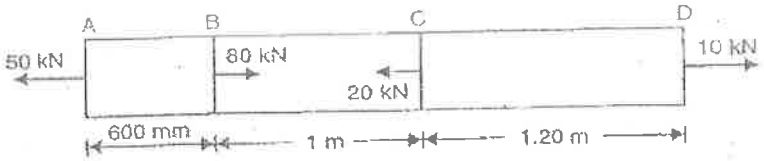
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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	State Hooke's law.	2	1	(2M)
b)	Write short notes on Bars of Varying section.	2	1	(2M)
c)	Enumerate types beams.	2	2	(2M)
d)	Write the relation between SF, BM and rate of loading at section of beam.	2	2	(2M)
e)	Discuss about flexural stresses.	2	3	(2M)
f)	Draw Shear stress distribution for rectangular section.	2	3	(2M)
g)	Elucidate Double integration method.	2	4	(2M)
h)	List applications of Mohr's theorem.	2	4	(2M)
i)	How do you classify columns.	2	5	(2M)
j)	Differentiate between thick and thin cylinders.	2	5	(2M)

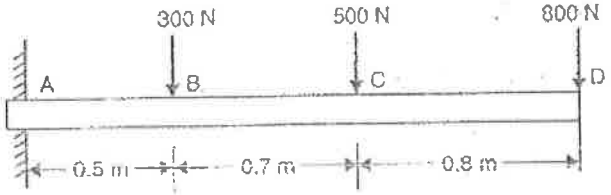
PART-B (5X10=50)

		BTL	CO	Marks
	UNIT-I			
2.	A rod of 150cm long and of diameter 2.0 cm is subjected to an axial pull of 20kN. If the modulus of elasticity of the material of the rod is 2×10^5 N/mm^2 ; determine i) stress ii) strain and iii) elongation of the rod	3	1	(10M)
	(OR)			
3.	A brass bar having a cross sectional area of 1000mm^2 is subjected to axial forced as shown in figure. Find the elongation of the bar. Take E=1.05×10^5 MPa.	3	1	(10M)



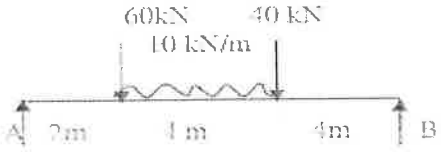
UNIT-II

4. A cantilever beam is carrying point loads, as shown in figure. Draw the SFD and BMD for the beam. 3 2 (10M)



(OR)

5. Draw the S.F and B.M diagrams of the beam shown in figure. 3 2 (10M)

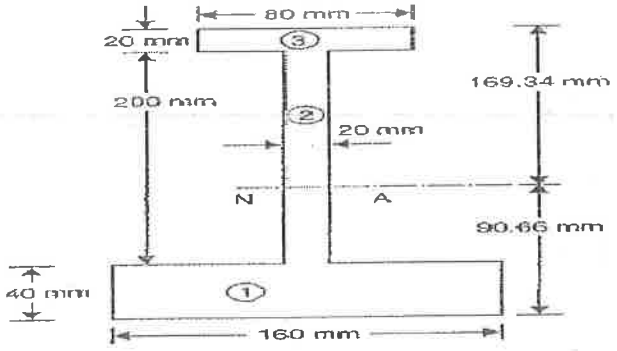


UNIT-III

6. Derive the bending equation from fundamentals M/I= σ/y = E/R. 3 3 (10M)

(OR)

7. A cast iron beam is of I section as shown in fig. the beam is simply supported on a span of 5m. if the tensile stress is not exceed 20N/mm^2,find the safe uniformly load which the beam can carry. Find also the maximum compressive stress. 3 3 (10M)



UNIT-IV

8. A cantilever beam of span 7 m carries a point load of 15 kN at a distance of 4 m from the free end. Compute (a) the slope (b) the deflection under the load (c) the maximum deflection and its location. Take E = 1.5 x 10^5 N/mm^2 and I = 5 x 10^8 mm^4 3 4 (10M)

(OR)

9.	What is a Macaulay's method? Where is it used? Find an expression for deflection at any section of a simply supported beam with an eccentric point load, using Macaulay's method.	3	4	(10M)

UNIT-V

10.	Derive the Euler's crippling load formula, when one end of the column is fixed and other end is free.	3	5	(10M)

(OR)

11.	A compound cylinder is made by shrinking a cylinder of external diameter 200 mm and an internal diameter 160 mm over another cylinder of external diameter 160 mm and internal diameter 120 mm. The radial pressure at the junction after shrinking is 8 N/mm2 . Find the final stress set up across the section, when the compound cylinder is subjected to an internal fluid pressure of 60 N/mm^2 .	3	5	(10M)

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Course Code: **23CE3T03**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)

II B. Tech I Semester Regular End Examinations (BR23), November - 2024

FLUID MECHANICS (CE)

Time: 3 hours Max. Marks: 70

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

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	Define the following fluid properties: i) Specific Weight ii) Density	L1	1	(2M)
b)	Define Newton's law of viscosity and give examples of its application.	L1	1	(2M)
c)	What do you understand by Hydrostatic Law?	L2	2	(2M)
d)	State the Pascal's Law.	L2	2	(2M)
e)	Distinguish between steady flow and unsteady flow.	L1	3	(2M)
f)	Explain the terms i) Stream line ii) Streak line	L3	3	(2M)
g)	Define orifice and venturi meter.	L1	4	(2M)
h)	What is Reynolds number?	L2	4	(2M)
i)	Define Hydraulic Gradient Line and Total Energy Line	L1	5	(2M)
j)	What is mean by equivalent length of a pipe?	L1	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2. (a)	Define surface tension. Prove that relationship between surface tension and pressure inside a droplet of liquid in excess of outside pressure given by $p = \frac{4\sigma}{d}$	BL2	CO 1	(10M)
	(OR)			
3.(a)	How does Viscosity of fluid varies with temperature and explain.	BL3	CO 1	(5M)
3.(b)	Explain the following: i) Newtonian and Non-Newtonian fluids ii) Vapour pressure and compressibility	BL2	CO 1	(5M)
	UNIT-II			
4.(a)	Differentiate the U-Tube Manometer and Differential manometer with neat sketch.	BL2	CO 2	(5M)
4.(b)	A U-Tube differential manometer is connects two pressure pipes A and B. The pipe A contains hydrogen tetrachloride having a sp. gravity 1.594 under the pressure of 11.772 N/cm^2 and pipe B contains oil of sp. gravity 0.8 under the pressure of 11.772 N/cm^2. The pipe A lies 2.5m above the pipe B. Find the difference of pressure measured by mercury of fluid filling U-tube.	BL4	CO 2	(5M)
	(OR)			
5.	Distinguish between Manometer, Atmospheric pressure, Gauge pressure and Absolute pressure.	BL3	CO 2	(10M)

UNIT-III

6.	Define and explain the following: i) Compressible and incompressible flow ii) Real and Ideal flows iii) uniform and non-uniform flow	BL3	CO 3	(10M)

(OR)

7.(a)	The diameter of pipes at section 1and 2 are 10 cm and 15 cm respectively. Find the discharge through pipe if the velocity of water flowing through the pipe at section 1 is 5 m/s then determine the velocity at section 2?	BL4	CO 3	(5M)
7.(b)	The stream function for a two dimensional flow is given by $\varphi = 2xy$, calculate the velocity at a point P (2,3). Find out the velocity potential function ϕ.	BL4	CO 3	(5M)

UNIT-IV

8.(a)	The water is flowing through a tapering pipe having diameters 300 mm and 150 mm at section 1 and 2 respectively. The discharge through the pipe is 40 lit/sec. The section 1 is 10 m above datum and section 2 is 6m above datum. Find the intensity of pressure at section 2 if that at section 1 is 400kN/m^2.	BL3	CO 4	(5M)
8.(b)	Explain briefly about orifice meter.	BL4	CO 4	(5M)

(OR)

9.	State Bernoulli's theorem for steady flow of an incompressible fluid. Derive an expression for Bernoulli's theorem from first principal and state its assumptions made such a derivation.	BL3	CO 4	(10M)

UNIT-V

10.	How you will determine the total head loss due to friction in pipes by using Darcy's formulae?	BL2	CO 5	(10M)

(OR)

11(a)	At a sudden enlargement of a water main from 240 mm to 480 mm diameter, the hydraulic gradient rises by 10 mm. Estimate rate of flow.	BL4	CO 5	(5M)
11(b)	Derive an expression for minor losses due to sudden contraction.	BL3	CO 5	(5M)

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Course Code: **23BS3T06**

NAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)

II B.Tech I Semester Regular End Examinations (BR23), November 2024

COMPLEX VARIABLES AND NUMERICAL METHODS

(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

PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	Construct aforward difference table for the following data x: 0, 1, 2, 3 y: 5, 12, 24, 36	L1	1	(2M)
b)	Write a relation between E and Δ	L1	1	(2M)
c)	Write Simpson's $3/8^{th}$ rule.	L1	2	(2M)
d)	Write the formula for Runge-Kutta 2^{nd} order method	L1	2	(2M)
e)	State Cauchy's integral formula	L2	3	(2M)
f)	Define Analytic functions.	L2	3	(2M)
g)	Determine the pole of the function $\cot z$	L2	4	(2M)
h)	Write the Maclaurin's series	L1	4	(2M)
i)	Define Bilinear transformation	L2	5	(2M)
j)	Define Invariants points	L2	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	Using Lagrange's formula , calculate y(3) from the following table: x: 0, 1, 2, 4, 5, 6 y: 1, 14, 15, 5, 6, 19	**L2**	1	(10M)
	(Or)			
3.	Using the Newton Raphson method, find an approximate root of the equation $2x^3 - 3x - 4=0$	**L2**	1	(10M)

	UNIT - II			
4.a	Evaluate $\int_0^{\pi} Sinx\ dx$ by using simpson's 1/3rd rule.	L3	2	(5M)
b	Using Taylor's series method, find an approximate value of y at x=0.2 for the equation $y' - 2y = 3e^x$, y(0)= 0	L2	2	(5M)
	(OR)			
5a.	Solve $y' = 2x - y$, $y(1) = 3$, find y(1.1)by R- K 4th order method	L2	2	(5M)
b	Solve $y' = x + y$, $y(0) = 1$ find y(0.1) by using modified euler's method	L2	2	(5M)
	UNIT-III			
6.	Prove that the function $f(z)$ defined by $f(z) = \begin{cases} \frac{x^3(1+i)-y^3(1-i)}{x^2+y^2}, (z \neq 0) \\ 0, z = 0 \end{cases}$ is continuous and the Cauchy- riemann equations are satisfied at the origin, yet $f'(0)$ does not exist.	L4	3	(10M)
	(OR)			
7.	Find the regular function whose imaginary part is $\frac{x-y}{x^2+y^2}$ using milne Thomson method.	L3	3	(10M)
	UNIT-IV			
8a.	Evaluate $\int_c \frac{e^{2z}}{(z+1)^3} dz$ using Residue theorem, where c is $\|z\| = 2$	L3	4	(5M)
b.	Expand $f(z) = \frac{1}{z^2}$ in powers of $z + 1$.	L2	4	(5M)
	(OR)			
9a.	Determine the poles and residues of $f(z) = \frac{z^2}{(z-1)^2(z+2)}$	L2	4	(5M)
b	Expand $f(z) = \frac{e^{2z}}{(z-1)^3}$ about $z = 1$ as a laurent's series.	L2	4	(5M)
	UNIT-V			
10.	Show that the function $w = \frac{4}{z}$ transforms the straight line $x = c$ in the $z-$plane into a circle in the $w-$plane.	L4	5	(10M)
	(OR)			
11.	Find the bilinear transformation that maps the points $(0, -i, -1)$ into the point $(i, 1, 0)$	L3	5	(10M)

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Course Code: **23ES3T06**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE:: ODALAREVU
(AUTONOMOUS)

II B.Tech I Semester Regular End Examinations (BR23), November 2024

ELECTROMAGNETIC FIELD THEORY (EEE)

Time: 3 hours Max. Marks: 70

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

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	Define electric field intensity.	BL1	1	(2M)
b)	Write the statement of Coulomb's law.	BL1	1	(2M)
c)	Identify equation of Ohm's law in point form.	BL1	2	(2M)
d)	What is polarization?	BL1	2	(2M)
e)	Define magnetic field and magnetic lines of force.	BL1	3	(2M)
f)	State Biot-Savart's law.	BL1	3	(2M)
g)	Define self and mutual inductance.	BL1	4	(2M)
h)	Examine the expression of energy stored in a static electric field.	BL1	4	(2M)
i)	State the faradays laws of electromagnetic induction.	BL1	5	(2M)
j)	Illustrate the Maxwell's equation for a good conductor.	BL1	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.(a)	The potential in a certain region is given by $V=4(x+2)^2(y+3)^2(z+4)^2$ in free space at point p(3,2,-2). Calculate the potential ,Electric Field Intensity and flux density at P.	BL2	1	(5M)
2,(b)	Derive the expression for electric field intensity due to infinite sheet of charge.	BL2	1	(5M)
	(OR)			
3.(a)	State and explain Gauss's law and mention its applications	BL2	1	(5M)
3.(b)	Find Electric Field Intensity Produced by a Point Charge Distribution at P(1,1,1) caused by 3nC point charges located at origin in xyz plane. .	BL2	1	(5M)
	UNIT-II			
4.(a)	What is meant by electric dipole? Explain how dipoles are formed.	BL2	2	(5M)
4.(b)	Derive the boundary conditions between two perfect dielectric materials.	BL2	2	(5M)
	(OR)			
5.(a)	Deduce the expression for capacitance of a spherical capacitor.	BL3	2	(5M)
5.(b)	Derive the boundary conditions between dielectric to conductor.	BL3	2	(5M)
	UNIT-III			
6.(a)	State and Explain Magnetic flux density and Maxwell's second equation.	BL2	3	(5M)
6.(b)	Derive the expression for magnetic field intensity at a point due to Infinite long current carrying conductor.	BL4	3	(5M)
	(OR)			

7.(a)	A coil of negligible dimensions of M turns in the form of a regular polygon of n sides inscribed in a circle of radius R meters. When the coil carries a current of I amperes in air, Show that the magnitude of the flux density at the centre is given by $B = \left(\mu oN.\frac{nI}{2\pi R}\right)\tan\left(\frac{\pi}{n}\right)$	BL3	3	(10M)

UNIT-IV

8.(a)	Determine the self-inductance of a coaxial cable of inner radius 3 cm and outer radius 6 cm.	BL3	4	(5M)
8.(b)	Deduce the expression for energy stored in inductor.	BL3	4	(5M)

(OR)

9.(a)	Define the mutual inductance and derive the expression for the coefficient of coupling.	BL3	4	(10M)

UNIT-V

10.(a)	State and Explain Poynting Theorem.	BL4	5	(5M)
10.(b)	Derive Maxwell's equations for static fields i.e. point form and integral form.	BL4	5	(5M)

(OR)

11(a)	State and explain Poynting vector.	BL4	5	(5M)
11(b)	Derive the expression of Maxwell's for time varying fields.	BL4	5	(5M)

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Course Code: **23EE3T03**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)

II B.Tech I Semester Regular End Examinations (BR23), November 2024

ELECTRICAL CIRCUIT ANALYSIS-II (EEE)

Time: 3 hours Max. Marks: 70

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

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PART–A (10X2 = 20M)

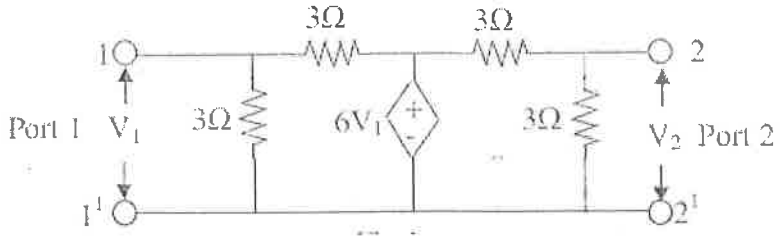
		BTL	CO	Marks
1.a)	Write any two conditions for balanced 3- phase system.	1	1	(2M)
b)	Determine line current I_1 , I_2 and I_3 for delta connected load. Assume the phase currents are $I_R = 20\angle -30^\circ$ A, $I_Y = 10\angle -180^\circ$ A and $I_B = 40\angle -150^\circ$ A.	2	1	(2M)
c)	Find the behaviour of L&C at t=0	1	2	(2M)
d)	Define time constant for of RL series circuit?	1	2	(2M)
e)	Express the Z-parameters in terms of Y- parameters	1	3	(2M)
f)	List the condition for Symmetry and Reciprocity of Z parameter.	2	3	(2M)
g)	Write the Fourier series in exponential form?	1	4	(2M)
h)	Write the formula for Fourier coefficients.	1	4	(2M)
i)	What is the transfer function for high pass filter?	2	5	(2M)
j)	Define filter in communications signals.	2	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	Derive the relationship between line and phase currents in delta connected system.	2	1	(10M)
	(OR)			
3.	A balanced three phase load of 20+j10Ω per phase is connected in delta across 440V, 3 phase supply. Determine line currents, phase currents & Total active power. Also draw the phasor diagram.	3	1	(10M)
	UNIT-II			
4.	Find the response i(t) in a series RL circuit when a step input of V volts is applied across it at time t = 0. Assume all initial conditions as zero.	2	2	(10M)
	(OR)			
5.	A series RLC circuit consists of a resistance 20Ω, inductance 0.05H and capacitance 20μF in series with a 100 V constant voltage source when the switch is closed at t=0. Find the expression for the current in the circuit. Also find the current at t=3ms.	3	2	(10M)

UNIT-III

6. Determine the ABCD parameters for the network shown in fig. 2 3 (10M)

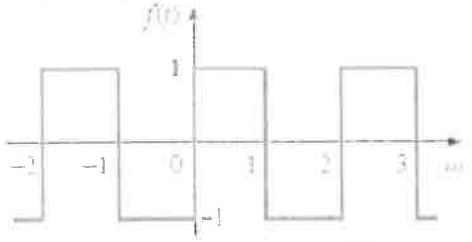


(OR)

7. Derive the expression for h- parameters in terms of ABCD-parameters. 3 3 (10M)

UNIT-IV

8. Find the Fourier series of the Square wave shown in figure. 4 4 (10M)



(OR)

9. State and Explain the Properties of Fourier Series. 2 4 (10M)

UNIT-V

10. Design a low pass filter (Both T and π section) having a cut off frequency of 2kHz to operate with terminated load of 500Ω. 3 5 (10M)

(OR)

11. Explain in detail about classification of filters. 3 5 (10M)

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Course Code: **23EE3T04**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)

II B.Tech I Semester Regular End Examinations (BR23), November 2024

DC MACHINES AND TRANSFORMERS (EEE)

Time: 3 hours Max. Marks: 70

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

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	Write the function of commutator in DC Machine?	BL1	1	(2M)
b)	Write the significance of Back EMF in a DC motor?	BL1	1	(2M)
c)	List the Various losses in a DC machine.	BL1	2	(2M)
d)	Why the swinburne's test is called predetermined test? Justify	BL1	2	(2M)
e)	List the constructional parts of transformer.	BL1	3	(2M)
f)	Define voltage regulation?	BL1	3	(2M)
g)	List the conditions for parallel operation of single-phase transformer.	BL1	4	(2M)
h)	Write the advantages of auto transformer over two winding transformer.	BL1	4	(2M)
i)	What is the purpose of Scott connection?	BL1	5	(2M)
j)	Write the advantages and limitations of Three winding transformers.	BL1	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	Illustrate the operation of DC motor and derive its torque equation.	BL2	1	(10M)
	(OR)			
3.	Draw the internal and external characteristics of DC shunt, series generators and explain them in detail?	BL2	1	(10M)
	UNIT-II			
4.(a)	Explain the applications of DC motors.	BL2	2	(5M)
4.(b)	Explain the significance of starter in DC Machine.	BL2	2	(5M)
	(OR)			

5.(a)	Explain the speed control methods of DC shunt motor.	BL2	2	(5M)
5.(b)	Explain brake test by neat diagram.	BL2	2	(5M)

UNIT-III

6.	Explain the principle of operation of single-phase transformer and demonstrate its emf per turn is same (EMF equation).	BL2	3	(10M)

(OR)

7.	Derive the expression for voltage regulation in a transformer?	BL3	3	(10M)

UNIT-IV

8.(a)	Explain the procedure to conduct OC, SC test on single-phase transformer.	BL2	4	(5M)
8.(b)	Write the merits and demerits of sumpner's test with neat circuit diagram.	BL2	4	(5M)

(OR)

9.(a)	With equal voltage ratio show the load sharing between two parallel transformers.	BL3	4	(5M)
9.(b)	Demonstrate the copper saving in auto transformer with respect to two winding transformers.	BL2	4	(5M)

UNIT-V

10.	Show how 3-phase to 2-phase conversion (scott connection) was done? Explain the concept in detail.	BL2	5	(10M)

(OR)

11.	Explain Y-Y & Δ-Δ connections of three phase transformers by neat sketches.	BL2	5	(10M)

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Course Code: 23BS3T07

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU

(AUTONOMOUS)

II B.Tech I Semester Regular End Examinations (BR23), November 2024

NUMERICAL METHODS AND TRANSFORM TECHNIQUES (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)	Write formula to find the root of the equation in Regula-Falsi method.	L1	1	(2M)
b)	Prove that $\Delta = E-1$	L2	1	(2M)
c)	Write Lagrange's interpolation formula to find y(x).	L2	2	(2M)
d)	Write Simpson's 1/3 rd rule, where number of sub intervals is 8.	L2	2	(2M)
e)	Find the Laplace transform of e^{-3t} sin5t.	L1	3	(2M)
f)	State Convolution theorem.	L2	3	(2M)
g)	Define Fourier coefficients for f(x) in the interval (-l,l), if f(x) is an even function.	L2	4	(2M)
h)	State Dirichlet's conditions of Fourier series.	L1	4	(2M)
i)	Write the formula for Fourier sine and cosine integrals.	L1	5	(2M)
j)	Define Fourier transform.	L1	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	Find the root of the equation $x^2-3x+1 = 0$ using Iteration method correct to 3 decimal places.	L3	1	(10M)
	(OR)			
3.	Use Newton's forward interpolation formula to find the value of $\sin52^0$ from the following table:	L3	1	(10M)

x	45^0	50^0	55^0	60^0
y	0.7071	0.7660	0.8192	0.8660

UNIT-II

4.(a)	Evaluate $\int_0^6 \frac{1}{1+x^2}\,dx$ by using simpson's 1/3rd rule	L3	2	(5M)
4.(b)	Using Runge Kutta method, solve $\frac{dy}{dx}=3e^x+2y$. Find y at x = 0, given y(0) =1.	L3	2	(5M)

(OR)

5.(a)	Solve the following D.E using Taylor's series method. $\frac{dy}{dx}=x^2y-1$, y(0) = 1 find y at x = 0.1	L3	2	(5M)
5.(b)	Evaluate $\int_4^{5.2} \log x\,dx$ using Trapezoidal rule, given that	L3	2	(5M)

x	4.0	4.2	4.4	4.6	4.8	5	5.2
y	1.3863	1.4351	1.4816	1.5261	1.5686	1.6094	1.6487

UNIT-III

6.	Solve the D.E $y^{11} - 6y^1 + 9y = t^2 e^{3t}$ if $y(0) = 2$, $y^1(0) = 6$ using Laplace Transforms.	L3	3	(10M)

(OR)

7.	Find $L^{-1}\left[\frac{1}{2}log\left\{\frac{s^2+b}{s^2+a}\right\}\right]$	L3	3	(10M)

UNIT-IV

8.(a)	Obtain the Fourier series of $f(x) = x$ in the range $-\pi < x < \pi$.	L2	4	(5M)
8.(b)	Find Fourier half range cosine series of the function f(x) = sin x in (0, π).	L2	4	(5M)

(OR)

9.(a)	Obtain the Fourier series of $f(x) = K$ in the interval (0,1).	L2	4	(5M)
9.(b)	Find the Half range sine series of $f(x) = x^2$ in (0, 2).	L2	4	(5M)

UNIT-V

10.	Find the finite Fourier transform of $f(x) = x^3$ in (0, π).	L2	5	(10M)

(OR)

11.	Find the Fourier cosine transform of $f(x) = e^{ax}$ in (0, 1).	L2	5	(10M)

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Course Code: **23ES3T05**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)

II B.Tech I Semester Regular End Examinations (BR23), November 2024

THERMODYNAMICS (ME)

Time: 3 hours Max. Marks: 70

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

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	Define thermodynamic property? Explain the types of properties with examples.	2	1	(2M)
b)	Differentiate between a closed system and an open system with examples.	2	1	(2M)
c)	Write short notes on point function and path function.	3	2	(2M)
d)	Define heat pump? Just write the relation between heat engine, Refrigerator and heat pump?	2	2	(2M)
e)	What is the Second Law of Thermodynamics?	3	3	(2M)
f)	Define entropy and explain its significance in thermodynamics.	3	3	(2M)
g)	Describe the phase change process of a pure substance with a P-T diagram.	2	4	(2M)
h)	What is the difference between sub cooled, saturated and superheated regions in pure substance?	2	4	(2M)
i)	What is the difference between Refrigeration & Air Conditioning?	3	5	(2M)
j)	What are the Psychometric process?	2	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	Define and explain a thermodynamic system. Differentiate between various types of thermodynamic systems and give examples of each of them.	3	1	(10M)
	(OR)			
3.(a)	With examples explain the Thermodynamic equilibrium?	2	1	(5M)
3.(b)	A stationary mass of gas is compressed without friction from an initial state of $0.3m^3$ and 0.105 MPa to a final state of 0.15 m^3 and 0.105 MPa, the pressure remaining constant during the process. There is a transfer of 37.6kJ of heat from the gas during the process. How much does the internal energy of the gas change?	4	1	(5M)

UNIT-II

4.(a)	State and Explain the Heat Engine with neat sketch?	2	2	(5M)
4.(b)	The COP of a refrigerator operating on a reversed Carnot cycle is 5.4 when it maintains -5^0C in evaporator. Determine the condenser temperature and refrigerating effect if the power required to run the refrigerator is 3.5kW.	4	2	(5M)
	(OR)			
5.	Write the steady flow energy equation for Boiler and turbine?	3	2	(10M)

UNIT-III

6.	Explain working of Carnot cycle with its schematic layout and P-V, T-S diagram and Derive expression for Thermal Efficiency?	3	3	(10M)
	(OR)			
7.(a)	Define the entropy and show that it is a property of system?	2	3	(5M)
7.(b)	$0.05m^3$ of air at a pressure of 8bar and 280^0C expands to eight times its original volume and the final temperature after expansion is 25^0C. Calculate change of entropy of air during the process. Assume C_P =1.005KJ/kgK; C_V = 0.712KJ/kg K	4	3	(5M)

UNIT-IV

8.(a)	Explain how wet steam, dry and saturated steam, superheated steam are produced. With the help of P-V and T-S diagrams?	3	4	(5M)
8.(b)	Calculate the enthalpy and internal energy of steam at a pressure of 12 bar. (i)When the steam is having a dryness fraction of 0.8 (ii)when steam is saturated and (iii) When the steam is super heated to a degree of superheat of 20^0C.	4	4	(5M)
	(OR)			
9.	Derive the expression for Clausius Clapeyron equation?	3	4	(10M)

UNIT-V

10.	Explain the working of vapour compression refrigeration system with the help of schematic layout?	3	5	(10M)
	(OR)			
11.(a)	Define and discuss the following psychrometric properties. (i)Dry bulb Temperature, (ii) Wet bulb Temperature, (iii) Dew point temperature, (iv) Specific humidity (v) Relative humidity	2	5	(5M)
11.(b)	Explain the use of heat pump for heating and cooling cycle with a neat diagram?	3	5	(5M)

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BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)

II B.Tech I Semester Regular End Examinations (BR23), November 2024

MECHANICS OF SOLIDS (ME)

Time: 3 hours | Max. Marks: 70

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

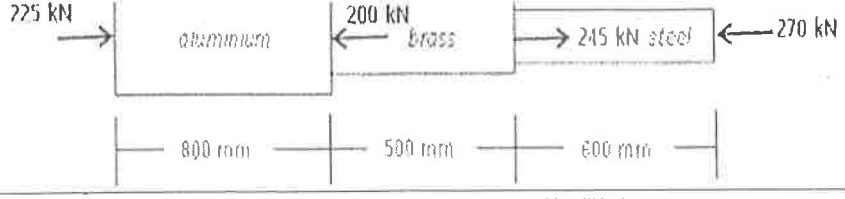
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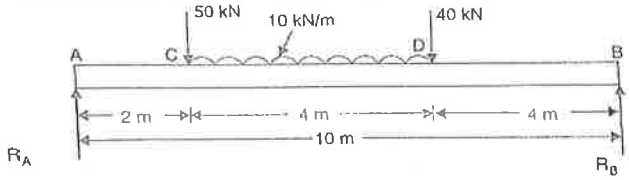
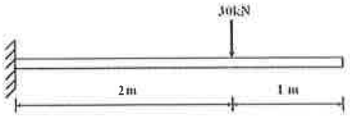
PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	Define the bulk modulus. How is it related to Young's modulus?	L1	1	(2M)
b)	In a tensile test on a mild steel specimen of original diameter 20 mm and gauge length 40 mm, the limit of proportionality load is 80 kN and the extension is 0·048 mm. Find the stress and Youngs modulus.	L1	1	(2M)
c)	Draw the BMD for a simply supported beam carrying uniformly distributed load throughout the beam	L1	2	(2M)
d)	Define the point of contraflexure? And how to find its location.	L1	2	(2M)
e)	Write the bending equation. Define each term and write its SI Units.	L1	3	(2M)
f)	Draw the shear stress distribution curve for the symmetrical I sectioned beam.	L2	3	(2M)
g)	Write the expression for maximum slope and deflection for a cantilever beam subjected to point load 'W' at its free end.	L1	4	(2M)
h)	Define the terms; torsion and torsional stiffness.	L1	4	(2M)
i)	Write three assumptions made in the analysis of thick cylinders.	L1	5	(2M)
j)	List out various end conditions for the column with crippling load formulae.	L1	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	A steel rod of 30mm diameter and 5 m long is connected to two grips and the rod is maintained at a temperature of 95^0C. Determine the stress and pull, when the temperature falls to 30^0C, if (i) the ends do not yield and (ii) the ends yield by 1.2 mm. Take $\alpha = 12 \times 10^{-6}$ / °C and $E = 2 \times 10^5$ N/mm^2.	L3	1	(10M)
	(OR)			
3.	A circular bar ABCD has aluminium, brass and steel sections and subjected to axial loads as shown in Figure given below. If the permissible stresses in aluminium, brass and steel are 85 N/mm^2, 70 N/mm^2 and 125 N/mm^2 respectively, find the required diameter for each bar. Find the change in length of each bar and also find the total change in length of the circular bar, if E_s = 200 GPa, E_{al} = 70 GPa and E_b = 105 GPa.	L3	1	(10M)



	UNIT-II			
4.	A simply supported beam of length 10 m, carries a UDL and two point loads as shown in the figure below. Draw the SF and BM diagrams for the beam. Also calculate the maximum Bending Moment 	L3	2	(10M)
	(OR)			
5.	A simply supported beam AB of span 12 m carries a U.D.L. of 22 N per metre over 5 metres from L.H support and also over 6 m from the R.H. supports. Draw the B.M. and S.F diagrams and calculate the B.M. at significant points.	L3	2	(10M)
	UNIT-III			
6.	A steel plate of width 120 mm and of thickness 20 mm is bent into a circular arc of radius 10 m. Determine the maximum bending stress induced and the bending moment which will produce the bending stress. Take E = 200 GPa.	L3	3	(10M)
	(OR)			
7.	A circular beam of 100 mm diameter is subjected to a shear force of 5 kN Calculate maximum shear stress and the shear stress at a distance of 35 mm from NA.	L3	3	(10M)
	UNIT-IV			
8.	Compute the maximum slope and maximum deflection of the cantilever shown in figure below. Take E = 2.1 × 10^5 N/mm^2 and I = 2 ×10^8 mm^4. 	L3	4	(10M)
	(OR)			
9.	A hollow shaft is used to transmit a power of 300 kW at 80 rpm. The maximum shear stress is not to exceed 80 N/mm^2 and internal diameter is 0.6 times external diameter. Find the external and internal diameters if the maximum torque is 1.4 times the mean torque.	L3	4	(10M)
	UNIT-V			
10.	Calculate change in diameter, change in length, and change in volume of a thin cylindrical shell 100 cm diameter, 1 cm thick, and 5 m long when subjected to internal pressure of 3 N/mm^2. Take the values of E = 2×10^5 N/mm^2 and Poisson's ratio = 0.3.	L3	5	(10M)
	(OR)			
11.	Determine the crippling load for a rectangular section of dimensions 12 cm× 3 cm and a length of 5 m when it is used as a strut with both of its ends are fixed. Take E = 2 ×10^5 N/mm^2.	L3	5	(10M)

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Course Code: **23ME3T02**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)

II B.Tech I Semester Regular End Examinations (BR23), November 2024

MATERIAL SCIENCE & METALLURGY (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 is Grain and Grain boundary in the process of crystallization of metals.	1	1	(2M)
b)	Explain Lever Rule.	2	1	(2M)
c)	Classify Cast Irons.	2	2	(2M)
d)	What are super alloys.	1	2	(2M)
e)	Explain various surface hardening methods.	2	3	(2M)
f)	What is tempering.	1	3	(2M)
g)	Illustrate atomization for making Metal Powders.	1	4	(2M)
h)	What is granulation in powder metallurgy.	1	4	(2M)
i)	What are the functions of matrix phase.	1	5	(2M)
j)	Explain cermet.	2	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	State and explain the Hume Rotherys rules with suitable examples.	2	1	(10M)
	(OR)			
3.	Explain Cu-Ni phase diagram and label the important reactions and regions.	2	1	(10M)
	UNIT-II			
4.	Explain the microstructure, properties and applications of grey cast Iron and white cast iron.	2	2	(10M)
	(OR)			
5.	List the alloys of copper. Explain about season cracking and Dezincification in brasses.	2	2	(10M)

UNIT-III

6.	Illustrate the construction of T-T-T diagram for eutectoid steel and indicate all regions.	2	3	(10M)
	(OR)			
7.	Explain Age hardening with suitable examples	2	3	(10M)

UNIT-IV

8.	What is powder metallurgy? Explain the process of sintering for Powder Metallurgical Parts.	2	4	(10M)
	(OR)			
9.	Contrast the powder metallurgical parts with conventional metal parts. Give various applications of powder metallurgical products.	2	4	(10M)

UNIT-V

10.	What is a ceramic? List various types of glasses and enumerate the properties and applications of glasses.	2	5	(10M)
	(OR)			
11.	Classify composite materials based on type of reinforcement. Explain fiber reinforced composites with simple sketches.	2	5	(10M)

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Course Code: **23BS3T08**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)

II B.Tech I Semester Regular End Examinations (BR23), November 2024

PROBABILITY THEORY AND STOCHASTIC PROCESS (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)

			CO	Marks
1.a)	Define a distribution function for a discrete random variable		1	(2M)
b)	What is the physical significance of variance?		1	(2M)
c)	State Chebchev's inequality.		2	(2M)
d)	Explain the concept of sum of two random variables		2	(2M)
e)	Define covariance of random variables X and Y.		3	(2M)
f)	Explain the term correlation ergodic process.		3	(2M)
g)	Determine whether the following functions can be a valid power density function or not? $\frac{\omega^2}{\omega^6+3\omega^2+3}$		4	(2M)
h)	Define random process.		4	(2M)
i)	How is mutual information related to entropy?		5	(2M)
j)	How is the partitioning of symbols done in Shannon-Fano coding?		5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	A random current is described by the sample space $S = \{-4 \le i \le 12\}$. A random variable X is defined by $$X(i) = \begin{cases} -2 & i \le -2 \\ i & -2 < i \le 1 \\ 1 & 1 < i \le 4 \\ 6 & 4 < i \end{cases}$$ Show, by a sketch, the value x into which the values of i are mapped by x. What type of random variable is X?	**3**	1	(10M)
	(OR)			
3.	State and prove any four Properties of probability density function	**2**	**1**	(10M)
	UNIT-II			
4.(a)	Explain about moments about origin and central moments.	2	2	(5M)
4.(b)	Write the properties of joint distribution function.	2	2	(5M)
	(OR)			

5.(a)	Consider a linear transformation of vector Random Variables of the form $Y = AX + b$,find relation between means of X and Y.	3	2	(5M)
5.(b)	State the central limit theorem for equal and unequal distributions.	2	2	(5M)
	UNIT-III			
6.	Let $X(t)$ be a WSS random process. Show that$R_{XX}(\tau) = R_{XX}(-\tau)$ and $\lvert R_{XX}(\tau)\rvert \leq R_{XX}(0)$.	3	3	(10M)
	(OR)			
7.	Random variables $X$and Yhave the joint density function $f_{X,Y}(x,y) = \begin{cases} (x+y)^2/40, -1 < x < 1 \text{ and } -3 < y < 3 \\ 0 \qquad\qquad elsewhere \end{cases}$ Find all the second-order moments of $X$and Y. What is the correlation coefficient?	3	3	(10M)
	UNIT-IV			
8.(a)	State and prove the properties of power spectral density.	2	4	(5M)
8.(b)	Define and derive the relation between Autocorrelation and Power Spectral Density for a random Process.	2	4	(5M)
	(OR)			
9.(a)	Discuss about Spectral Characteristics of Power Density Spectrum.	2	4	(5M)
9.(b)	Write short notes on cross Power Density Spectrums of Input and Output.	2	4	(5M)
	UNIT-V			
10.	A random noise $X(t)$, having a power spectrum $S_{XX}(\omega) = \frac{3}{49+\omega^2}$is applied to a differentiatorand the differentiator's output is applied to a network for which $h_2(t) = u(t)t^2 2xp(-7t)$.The network's response is a noise denoted by Y(t). (i) What is the average power in $X(t)$ (ii) Find the power spectrum of $Y(t)$ (iii) Find the average power in $Y(t)$	3	5	(10M)
	(OR)			
11.	Derive the expression for noise figure of a cascaded two port network.	3	5	(10M)

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Course Code: **23ES3T08**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)

II B.Tech I Semester Regular End Examinations (BR23), November 2024
SIGNALS AND SYSTEMS (ECE)

Time: 3 hours Max. Marks: 70

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

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	How are the signals are classified?	1	1	(2M)
b)	Is y(t) = x (-t), a causal or non-causal system?	2	1	(2M)
c)	What are the three important classes of Fourier series methods available	1	2	(2M)
d)	what is Fourier transform?	2	2	(2M)
e)	What is the Relationship between rise time and bandwidth	2	3	(2M)
f)	What is the response for an input x(t) of a distortion less transmission system.?	2	3	(2M)
g)	What is the effects aliasing?	2	4	(2M)
h)	Define sampling and sampling period?	2	4	(2M)
i)	What is the relation between Laplace transform and Fourier transform?	2	5	(2M)
j)	State the initial and final value theorems of Z-Transforms?	2	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	(a) Write short notes on the following signals: (i) Unit step (ii) Unit impulse (iii) Unit ramp (iv)Signum function	2	1	(10M)
	(OR)			
3.(a)	Explain approximation of a function by a set of mutually orthogonal functions and evaluate the mean square error?	3	1	(5M)
3.(b)	Show that the functions $\sin n\omega_0 t$ and $\cos m\omega_0 t$ are orthogonal over any interval $\left(t_0, t_0 + \frac{2\pi}{\omega_0}\right)$ for integer values of n and m.	3	1	(5M)

UNIT-II

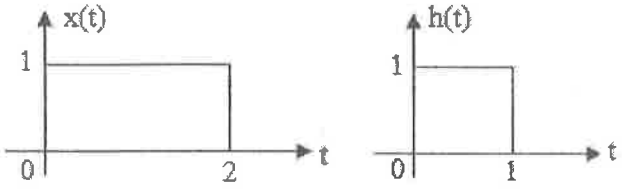
4.(a)	Find the Fourier transform of Double-sided Real exponential function $e^{-a\|t\|}$ and draw its spectrum	3	2	(5M)
4.(b)	State and prove differentiation in time domain property of Fourier transform.	3	2	(5M)

(OR)

5.	Derive the expressions for the trigonometric Fourier series coefficients	3	2	(10M)

UNIT-III

6.	Find the convolution of the following signals using graphical method	3	3	(10M)



(OR)

7.(a)	Obtain the conditions for the distortion less transmission through a system.	3	3	(5M)
7.(b)	Let the transfer function of an LTI system be $\frac{1}{j\omega+2}$. What is the output of the system for an input $(0.8)^t\, u\,(t)$.	3	3	(5M)

UNIT-IV

8.(a)	State and prove the relation between convolution and correlation.	3	4	(5M)
8.(b)	Discuss the effects of Under sampling?	2	4	(5M)

(OR)

9.	Prove that for a signal, auto correlation function and power spectral density forms a Fourier transform pair.	3	4	(10M)

UNIT-V

10.	For the transfer function $H(s) = \frac{s+5}{s^2+3s+2}$ Find the response due to input $x(t) = \cos 2t\, u(t)$.	3	5	(10M)

(OR)

11.(a)	State and prove the following properties of z-transforms i) Time Reversal property ii) Differentiation in z-domain property	3	5	(5M)
11.(b)	Find Z-Transform, ROC and Pole-Zero locations of $x[n] = a^n u[n]$	3	5	(5M)

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Course Code: 23EC3T01

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)

II B.Tech I Semester Regular End Examinations (BR23), November 2024

ELECTRONIC DEVICES AND CIRCUITS (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)	Explain the difference between intrinsic and extrinsic semiconductors.	2	1	(2M)
b)	Compare drift and diffusion currents of a Semiconductor in detail.	3	1	(2M)
c)	Distinguish between avalanche and Zener mechanisms of a diode.	3	2	(2M)
d)	List out the applications of LED with examples.	2	2	(2M)
e)	Compare the performance of inductive, L-section and π section fitters.	3	3	(2M)
f)	Derive the relation between α and β.	3	3	(2M)
g)	What is thermal runaway.	2	4	(2M)
h)	Draw the transistor hybrid model circuit.	3	4	(2M)
i)	Define trans-conductance g_m and drain resistance of a FET.	2	5	(2M)
j)	List out few comparisons of BJT and FET	2	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	Derive the continuity equation.	3	1	(10M)
	(OR)			
3.	Draw the energy band diagram of a p-n junction under open circuit condition and write the expression for contact potential.	3	1	(10M)
	UNIT-II			
4.	Draw the circuit diagram and explain the operation of full wave rectifier using center tap transformer and using bridge rectifier without center tap transformer. Obtain the expression for peak inverse voltages of both.	3	2	(10M)
	(OR)			

5.	Explain working of the UJT with its construction and V I characteristics.	2	2	(10M)

UNIT-III

6.	Explain about input and output characteristics of a transistor when it is connected in common base configuration.	2	3	(10M)

(OR)

7.	Draw the fixed bias circuit and explain it. Write the draw backs of it.	3	3	(10M)

UNIT-IV

8.	Draw the circuit diagram of CE amplifier, explain its operation and analysis with approximate h parameter model.	3	4	(10M)

(OR)

9.	Derive the general expressions for current gain, input impedance, voltage gain and output impedance of transistor amplifier using h-parameters.	3	4	(10M)

UNIT-V

10.	Explain drain-source characteristics and transfer characteristics of JFET.	2	5	(10M)

(OR)

11.	Sketch the circuit of CS amplifier and derive the expression for voltage gain at low frequencies.	3	5	(10M)

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Course Code: **23EC3T02**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)

II B.Tech I Semester Regular End Examinations (BR23), November- 2024

SWITCHING THEORY AND LOGIC DESIGN (ECE)

Time: 3 hours Max. Marks: 70

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

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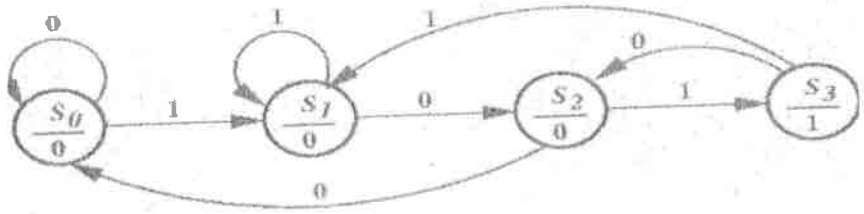
PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	Convert the decimal number $(157)_{10} - ()_2$ into its binary equivalent.	BTL2	CO 1	(2M)
b)	Define Boolean algebra and list its basic postulates.	BTL1	CO 1	(2M)
c)	Implement a Half adder circuit using basic gates.	BTL2	CO 2	(2M)
d)	Simplify the Boolean function F(A, B, C)=A+A′C using Boolean laws.	BTL2	CO 2	(2M)
e)	Draw the logic diagram of 1X16 Demux.	BTL1	CO 3	(2M)
f)	Write a short note on Programmable Logic Arrays (PLAs).	BTL1	CO 3	(2M)
g)	Distinguish between synchronous and asynchronous counters.	BTL2	CO 4	(2M)
h)	List the applications of Flip Flop.	BTL1	CO 4	(2M)
i)	Define a state table in sequential circuits.	BTL1	CO 5	(2M)
j)	Explain the advantages of FSMs.	BTL2	CO 5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	Perform the following operations in binary: (i) 1101+1011 (ii) 10111-10001 using 1's complement.	BTL2	CO 1	(10M)
	(OR)			
3.	Generate the Hamming Code for the message 101011 using odd parity.	BTL3	CO 1	(10M)
	UNIT-II			
4.	Explain the working of a BCD Adder circuit.	BTL3	CO 2	(10M)
	(OR)			
5.	Minimize the function F(A,B,C,D)=$\sum$m(0,2,3,7,9,12,14) using K-Map and implement the circuit using NAND gates.	BTL4	CO 2	(10M)
	UNIT-III			

6.	Explain the operation of Priority Encoder.	BTL3	CO 3	(10M)
	(OR)			
7.	Design Full adder using PAL and PLA.	BTL4	CO 3	(10M)
	UNIT-IV			
8.	Explain the operation of a MOD-8 counter with a neat diagram.	BTL3	CO 4	(10M)
	(OR)			
9.	Discuss the working of a Master-Slave Flip-Flop with its characteristic table.	BTL3	CO 4	(10M)
	UNIT-V			
10.	Design a sequence generator for 10110.	BTL3	CO 5	(10M)
	(OR)			
11.	Convert the given Moore state machine to Mealy state machine.	BTL4	CO 5	(10M)



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Course Code: 23BS3T09 (5)

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)

II B.Tech I Semester Regular End Examinations (BR23), November 2024

DISCRETE MATHEMATICS & GRAPH THEORY

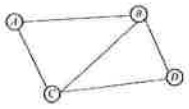
(CSE, CSE_AI&DS, AI&ML, CSE_AI&ML)

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

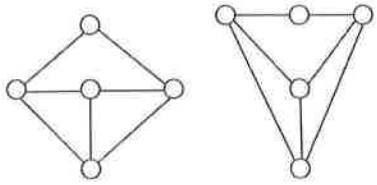
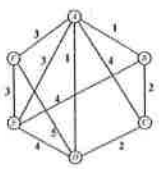
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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	**Construct** the truth table $(\neg q \wedge p) \rightarrow (\neg p \vee q)$.	1	1	(2M)
b)	**Write** each of the following in symbolic form: (i) All men are giants (ii) Some men are giants.	1	1	(2M)
c)	Let the relation $R = \{(1, 1), (1, 3), (2, 2), (3, 1), (3, 2)\}$ be defined on the set $S = \{1, 2, 3\}$. Then **find** the transitive closure of R?	2	2	(2M)
d)	**Define** partial ordered set (poset).	1	2	(2M)
e)	**How many** different permutations can be made from the word "COLLEGE".	1	3	(2M)
f)	**Find** the order and degree of the recurrence relation $s_{n+2} + 100 s_{n+1} - 10,000 s_n = 0, \forall n \geq 0$.	3	3	(2M)
g)	**Explain** Handshaking property with a suitable example.	1	4	(2M)
h)	**Write** the adjacency matrix for the following graph. 	1	4	(2M)
i)	**Find** the maximum number of edges possible in a connected simple planar graph with eight vertices.	2	5	(2M)
j)	**Find** the chromatic number of a cyclic graph of order 6.	4	5	(2M)

PART–B (5X10 = 50M)

	UNIT-I	BTL	CO	Marks
2.	**A) Obtain** the Principal Conjunctive Normal Form (PCNF) for the formula $[P \rightarrow (Q \wedge R)] \wedge [\sim P \rightarrow (\sim Q \wedge \sim R)]$.	**4**	1	(5M)
	B) **Verify** whether $[(p \rightarrow q) \rightarrow r] \rightarrow [(p \rightarrow q) \rightarrow (p \rightarrow r)]$ a tautology?	**3**	1	(5M)
	(OR)			
3.	A) **Verify** the validity of the following argument "Every living thing is a plant or an animal. Joe's gold fish is alive and it is not a plant. All animals have hearts. Therefore Joe's gold fish has a heart".	**3**	1	(5M)

	B) **Show that** the following premises are inconsistent. (i) If jack misses many classes, through illness then he fails high school. (ii) If jack fails high school, then he is uneducated. (iii) If jack reads a lot of books then he is not uneducated. (iv) Jack misses many classes through illness and reads a lot of books.	**3**	1	(5M
	UNIT-II			
4.	A) **Draw** the hasse diagram of positive common divisors of 36 and 120 under the partial order relation '$\leq$' defined as $x \leq y$ iff x *divides* y.	4	2	(5M)
	B) **Prove that** a binary relation R is defined on a set $S=\{1, 2, 3, 4, 5, 6, 7\}$ as $xRy \Leftrightarrow x-y$ is divisible by 3 is an equivalence relation.	3	2	(5M)
	(OR)			
5.a	**Find** the number of positive integers not exceeding 2000 is divisible by 7 or 11.	4	2	(5M)
5.b	Let $f: R \to R$ be given by $f(x)=4\,e^{6x+2}$. Then **evaluate** f^{-1}.	5	2	(5M)
	UNIT-III			
6.	**Solve** the recurrence relation $a_{n+2}+3a_{n+1}+2a_n=3^n$, $a_0=1$, $a_1=1$, $n \geq 0$.	3	3	(10M)
	(OR)			
7.	**Determine** the coefficient of $a^2cd^3e^4$ in $(a+b+c+d+e)^{10}$ and the independent term in $\left(x+\frac{1}{x}\right)^{20}$.	4	3	(10M)
	UNIT-IV			
8.	**Write** a brief note on the following graphs with suitable examples (a) Semi Euler graph (b) Euler graph	3	4	(10M)
	(OR)			
9.	**Test** whether the following graphs are isomorphic or not. 	4	4	(10M)
	UNIT-V			
10.	**Show that** a complete bipartite graph $K_{2,2}$ and $K_{2,3}$ are a planar graphs and Kuratowski's second graph $K_{3,3}$ is a non-planar graph.	3	5	(10M)
	(OR)			
11.	**Using** Kruskal's algorithm to **find** the minimal spanning tree of the following weighted graph. 	3	5	(10M)

Course Code: 23ES3T09

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU

(AUTONOMOUS)

II B.Tech I Semester Regular End Examinations (BR23), November 2024

DIGITAL LOGIC & COMPUTER ORGANIZATION (CSE)

Time: 3 hours Max. Marks: 70

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

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	Convert $(1011)_2$ to decimal.	4	1	(2M)
b)	Define a Karnaugh Map (K-Map).	1	1	(2M)
c)	What is the difference between a latch and a flip-flop?	1	2	(2M)
d)	Define a parallel-in parallel-out (PIPO) register.	1	2	(2M)
e)	What is multiprogramming in computer systems?	1	3	(2M)
f)	What is a floating-point number?	2	3	(2M)
g)	Define primary memory and give two examples.	1	4	(2M)
h)	What is the role of the Memory Management Unit (MMU) in virtual memory.	2	4	(2M)
i)	Define an interrupt in a computer system.	1	5	(2M)
j)	Name two advantages of using DMA.	1	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	Construct a 8x1 multiplexer circuit using only NAND gates and explain its operation.	4	1	(10M)
	(OR)			
3.(a)	Problem-solving: Perform $(1101)_2$+$(1101)_2$ using 2's complement subtraction and verify the result.	4	1	(5M)
3.(b)	Convert the following numbers. i) $(ABCD)_{16}$ = ( )$_2$ ii) ii) $(11010110)_2$ = ( )$_8$	4	1	(5M)
	UNIT-II			
4.(a)	Discuss the applications of binary counters in digital systems. Provide examples.	2	2	(5M)
4.(b)	Describe the components of Counters with a neat diagram and explain their roles.	2	2	(5M)
	(OR)			
5.	Explain the different types of registers (e.g., shift registers, buffer registers) and their applications in digital circuits.	2	2	(10M)

	UNIT-III			
6.	Compare single-bus and multi-bus systems in terms of speed, complexity, and cost.	4	3	(10M)
	(OR)			
7.(a)	Describe the process of floating-point addition and the challenges involved in aligning the exponents.	2	3	(5M)
7.(b)	Discuss the role of fast adders in modern processors. Explain their importance in arithmetic units and how they impact processor performance.	2	3	(5M)
	UNIT-IV			
8.(a)	What are the differences between static RAM (SRAM) and dynamic (DRAM)	1	4	(5M)
8.(b)	Compare primary memory, secondary memory, and cache memory.	4	4	(5M)
	(OR)			
9.	Explain virtual memory and its implementation using paging and segmentation.	2	4	(10M)
	UNIT-V			
10.	Explain the concept of Direct Memory Access (DMA) and describe its working with a block diagram.	2	5	(10M)
	(OR)			
11(a)	Explain the advantages of using DMA over CPU-based data transfer methods.	2	5	(5M)
11(b)	Discuss the types of interrupts (hardware, software, maskable, non-maskable) with examples	2	5	(5M)

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Course Code: **23CS3T02**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)

II B.Tech I Semester Regular End Examinations (BR23), November 2024

ADVANCED DATA STRUCTURES AND ALGORITHM ANALYSIS

Common to CSE, 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 about the Deletion operation in B-Trees.	BL1	1	(2M)
b)	Explain in detail about asymptotic notations.	BL2	1	(2M)
c)	Give the properties of binomial heaps.	BL2	2	(2M)
d)	Explain the biconnected components.	BL2	2	(2M)
e)	What are the advantages and disadvantages of Quick sort?	BL1	3	(2M)
f)	Describe about the minimum cost Spanning Trees.	BL1	3	(2M)
g)	What do you mean by Dynamic Programming?	BL1	4	(2M)
h)	What are the uses of Graph Coloring?	BL1	4	(2M)
i)	Distinguish between backtracking and branch – and bound techniques.	BL2	5	(2M)
j)	Compare NP-hard and NP-completeness.	BL3	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	Discuss about the Space Complexity and Time complexity with Example.	BL2	1	(10M)
	(OR)			
3.	Explain the Procedure for different Operations of AVL Tree.	BL4	1	(10M)
	UNIT-II			
4.	Give the brief Description of Heap Trees and its Applications.	BL3	2	(10M)
	(OR)			
5.	Demonstrate the Binary Search Tree with example.	BL5	2	(10M)
	UNIT-III			
6.	Illustrate about the 0/1 Knapsack Problem using dynamic programming.	BL3	3	(10M)
	(OR)			
7.	Explain about the Job Sequencing with deadlines.	BL4	3	(10M)
	UNIT-IV			
8.	Difference between All Pairs Shortest Path and Bellmen ford Algorithm.	BL3	4	(10M)
	(OR)			
9.	Write a Program to implement n-queens Problem.	BL5	4	(10M)
	UNIT-V			
10.	Illustrate about travelling sales man problem using Branch and Bound.	BL4	5	(10M)
	(OR)			
11.	Elaborate in detail about the class P, NP, NP-hard and NP-complete problems.	BL3	5	(10M)

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Course Code: **23CS3T03**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)

II B.Tech I Semester Regular End Examinations (BR23), November-2024

OBJECT ORIENTED PROGRAMMING THROUGH JAVA

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

Time: 3 hours Max. Marks: 70

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

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	What is byte code? How it is generated.	L2	1	(2M)
b)	Write the various applications of Object-Oriented Programming.	L1	1	(2M)
c)	Write any three differences between constructors and methods in Java.	L1	2	(2M)
d)	Explain the process of creating classes and objects in Java.	L2	2	(2M)
e)	Discuss in brief the role of super keyword in inheritance in Java.	L2	3	(2M)
f)	What is functional interface? When it is used?	L2	3	(2M)
g)	What is the use of the finally block in Java exception handling?	L1	4	(2M)
h)	What is Autoboxing and Autounboxing?	L1	4	(2M)
i)	What is thread priority? Write the constants used for thread priorities.	L1	5	(2M)
j)	Write any three differences between String class and String Buffer class.	L2	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.	How would you design a basic Java program that takes user input and uses command line arguments to perform arithmetic operations?	L3	1	(10M)
	(OR)			
3.	Examine the various flow control mechanisms in Java, including branching, conditional statements and loops.	L3	1	(10M)
	UNIT-II			
4. a)	Write a Java program that creates a class `Employee` with attributes like `name`, `age`, and `salary`, and includes methods to read and display employee details. Instantiate objects of this class and call the methods.	L3	2	(5M)
b)	What is a Constructor? Explain types of Constructors in Java? Write a java program to find the Area of Circle using Constructor.	L3	2	(5M)
	(OR)			

5. (a)	Explain method overloading in Java with example program	L2	2	(5M)
(b)	Explain this key word with suitable example.	L2	2	(5M)

UNIT-III

6.	Explain the different types of inheritance supported in Java (single, multilevel, hierarchical). Provide examples of each type.	L2	3	(10M)

(OR)

7.	Write a Java program that demonstrates the use of the Arrays class for sorting and searching in an array of integers.	L3	3	(10M)

UNIT-IV

8. (a)	How to handle multiple catch blocks for a nested try block? Explain with an example.	L2	4	(5M)
(b)	Explain about different types of I/O streams.	L2	4	(5M)

(OR)

9. (a)	What is a Package? Explain the Packages with an example and how to import packages?	L2	4	(5M)
(b)	Define exception. Write a java program to demonstrate the keywords try, catch and finally.	L3	4	(5M)

UNIT-V

10.	What is string class? Write a java program to reverse the string?	L3	5	(10M)

(OR)

11.	What is multithreading? In how many ways Java implements multithreading? Explain with example for each.	L2	5	(10M)

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Course Code: 23ES3T10

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)

II B.Tech I Semester Regular End Examinations (BR23), November 2024

DATABASE MANAGEMENT SYSTEMS (CSE(AI&DS))

Time: 3 hours Max. Marks: 70

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

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PART–A (10X2 = 20M)

		BTL	CO	Marks
1.a)	Write any two Applications of DBMS?	1	1	(2M)
b)	What is meant by file Processing ?	1	1	(2M)
c)	What is Table ? How to define the Table.	2	2	(2M)
d)	What are views ?	2	2	(2M)
e)	What is the use of COMMIT Command ?	1	3	(2M)
f)	Explain Tuple.	1	3	(2M)
g)	Define Attribute	1	4	(2M)
h)	Define Functional Dependency.	2	4	(2M)
i)	What are the various file Operations?	2	5	(2M)
j)	Define Query Optimization.	1	5	(2M)

PART–B (5X10 = 50M)

		BTL	CO	Marks
	UNIT-I			
2.(a)	Define a) Entity b) Attribute c) Relationship with examples	**2**	1	(5M)
2.(b)	Explain about Database Architecture?	**2**	1	(5M)
	(OR)			
3.(a)	Explain about Database users and Administrators?	**1**	1	(5M)
3.(b)	Explain about Logical database design?	**1**	1	(5M)
	UNIT-II			
4.	What are Data Models ? Describe the various Data Models	2	2	(10M)
	(OR)			
5.	Briefly discuss about the Relational Algebra.	2	2	(10M)

UNIT-III

6.(a)	Explain with an example the basic structure of SELECT Statement	2	3	(5M)
6.(b)	Explain the Following terms : a) Set Operations b) Update Operations	2	3	(5M)
	(OR)			
7.(a)	Explain the Following Relational Expression a) Natural Join b) Set Intersection.	3	3	(5M)
7.(b)	What are aggregate functions and Explain with Example.	2	3	(5M)

UNIT-IV

8.	Discuss the properties of decomposition. Explain BCNF	1	4	(10M)
	(OR)			
9.	Explain in detailed about Normalization with Example	2	4	(10M)

UNIT-V

10(a)	Explain in detail ACID properties of transactions	1	5	(5M)
10(b)	Explain serializability. Discuss recoverability.	2	5	(5M)
	(OR)			
11(a)	Describe briefly about deadlock? Explain its Mechanism	1	5	(5M)
11(b)	Explain about Atomicity Recovery Algorithm ?	2	5	(5M)

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Course Code: **23ES3T11**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE :: ODALAREVU
(AUTONOMOUS)

II B.Tech I Semester Regular End Examinations (BR23), November 2024

ARTIFICIAL INTELLIGENCE (AIML&CSM)

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 Artificial Intelligence?	1	1	(2M)
b)	What is the main purpose of Agent?	1	1	(2M)
c)	Mention the importance of Ridges and Plateaus in Hill Climbing?	2	2	(2M)
d)	List the essential steps involved in Problem solving.	1	2	(2M)
e)	What is Constraint Propagation?	2	3	(2M)
f)	Specify the importance of inference engine in AI.	1	3	(2M)
g)	Write the possible solutions for Vacuum Word problem.	1	4	(2M)
h)	Write about forward and backward chaining.	2	4	(2M)
i)	What role does the inference engine play in an expert system?	1	5	(2M)
j)	What is the purpose of a knowledge base in an expert system?	1	5	(2M)

PART–B (5X10 = 50M)

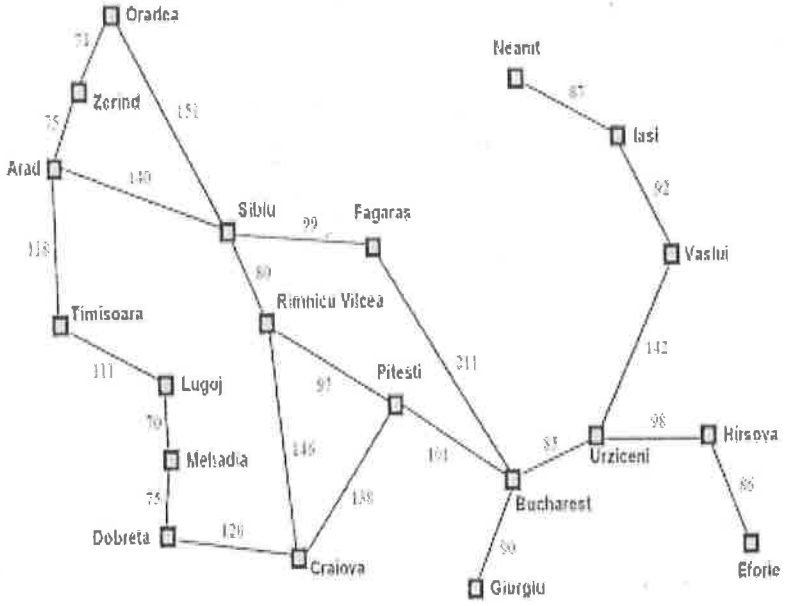
		BTL	CO	Marks
	UNIT-I			
2.	Write the Procedure for Problem Solving in AI and Construct the different types of environments with examples.	**2**	1	(10M)
	(OR)			
3.	With a neat sketch explain the following agents: a. Simple Agent b. Model Based Agent	**3**	1	(10M)
	UNIT-II			
4.	Differentiate Informed and Uniformed Search strategies and how to implement AO* Search in AI with example.	2	2	(10M)

(OR)

5. Apply A* Search find the optimal solution for the following problem. 3 2 (10M)

Consider the Road Map for Romania and h_{SLD} distances for each city.

Here Initial State: Arad Goal State: Bucharest



Straight-line distance to Bucharest	
Arad	366
Bucharest	0
Craiova	160
Dobreta	242
Eforie	161
Fagaras	178
Giurgiu	77
Hirsova	151
Iasi	226
Lugoj	244
Mehadia	241
Neamt	234
Oradea	380
Pitesti	98
Rimnicu Vilcea	193
Sibiu	253
Timisoara	329
Urziceni	80
Vaslui	199
Zerind	374

UNIT-III

6. Compare and contrast Predicate Logic and First Order Logic. Write the Inference Rules in AI with examples. 2 3 (10M)

(OR)

7. a. Write the Knowledge representation issues. 3 3 (05M)

b. Specify the importance of Baye's Probabilistic inferences in AI. 2 3 (05M)

UNIT-IV

8. Define inductive learning and provide an example. How does it differ from deductive learning? 3 4 (10M)

(OR)

9. With neat sketch How to solve the 8 Queen's Problem Using AI. 4 4 (10M)

UNIT-V

10. a. Define an expert system. What are the key components that make up an expert system? 2 5 (05M)

b. Explain the functionality of the XCON expert system. How did it improve the process of configuring computer orders? 4 5 (05M)

(OR)

11. Draw the Architecture of Expert System and write the roles of Expert System. 2 5 (10M)

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