NARASARAOPETA ENGINEEERING COLLEGE:NARASARAOPET
(AUTONOMOUS)
II B.Tech I Semester Regular Examinations: December-2024
(Branches: CSE, AI, IT, ME &CE)
ENVIRONMENTAL STUDIES

Sub Code: R23CC21MC   Max. Marks: 5x14=70M
Time: 3 hours   Date: 23-12-2024
Note: Answer All FIVE Questions.

All Questions Carry Equal Marks

UNIT-1

1. A) Define the environment? Why environmental studies considered as a multi-disciplinary subject? What is the scope of environmental education?   (CO1 K2 14M)

OR

B) Write notes on Environmental effecting of extracting and using mineral resources?
(CO1 K3 14M)

UNIT-1I

2. A) What are ecological pyramids? Explain why some of these pyramids are upright while others are inverted in different ecosystems?   (CO2 K2 14M)

OR

B) Explain various values in biodiversity? Explain about India as a mega-diversity nation.
(CO2 K2 14 M)

UNIT-1II

3. A) Discuss adverse effects and control of water pollution?
(CO3 K2 14M)

OR

B Classified solid waste? What adverse effects can solid waste cause? How can the solid waste be managed?   (CO3 K1&K2 14 M)

UNIT-1V

4. A) Discuss the salient features of (a) wildlife protection act 1972 (b)forest conservation act 1980.
(CO4   K2 14M)

OR

B) What is a watershed? Critically Discuss the objectives and practices of watershed Management.
(CO4   K2   14M)

UNIT-V

5. A) Discuss the environmental and social impacts of growing population. With a neat diagram, Explain the variation in population growth among various nations   (CO5 K2 14M)

OR

B) Explain the role of information technology in environment and human health.

(CO5   K2 14M)

II B.Tech I Semester Regular Examinations, December-2024

R23

Sub Code: R23CC2102

UNIVERSAL HUMAN VALUES

Time: 3 hours.

(COMMON TO ALL BRANCHES)   Max. Marks: 70

Note: Question Paper consists of Two parts (Part-A and Part-B)

PART-A
Answering all the questions from Part-A is compulsory (10 x 2M = 20M)

Q.No		Questions	KL	CO	M
1	a	Describe the value education.	2	1	2M
	b	Differentiate between happiness and prosperity.	2	1	2M
	c	Define the concept of harmony in the human being.	1	2	2M
	d	Interpret the harmony in the self.	2	2	2M
	e	Describe the harmony in the family.	2	3	2M
	f	Differentiate between 'trust' and 'respect'.	2	3	2M
	g	List the four orders of nature.	2	4	2M
	h	Interpret the interconnectedness in nature	2	4	2M
	i	Define the term definitiveness of ethical human conduct.	1	5	2M
	j	Describe the natural acceptance.	2	5	2M

PART-B
Answer either 'a' or 'b' from each question of PART-B (5 x 10M = 50M)

Q.No		Questions	KL	CO	M
		Unit-I			
2	a	i) Explain the role of education in achieving holistic development.	2	1	5M
		ii)Outline the method to fulfill basic human aspirations.	2	1	5M
		OR			
	b	i) List the basic components of holistic development.	2	1	5M
		ii) Explain the current scenario concerning happiness and prosperity in society.	2	1	5M
		Unit-II			
3	a	i)Explain the co-existence of the self and the body.	2	2	5M
		ii)How do the needs of the self differ from the needs of the body?	2	2	5M
		OR			
	b	i) Briefly explain the role of health in ensuring harmony in the human being.	2	2	5M
		ii) Discuss the key components of a programme for self-regulation?	2	2	5M
4		**Unit-III**			
	a	i) Explain the significance of 'trust' as a foundational value in relationships.	2	3	5M
		ii) Explain why harmony in the family is considered the basic unit of human interaction.	2	3	5M

			KL	CO	M
		OR			
	b	i) Explain the importance of harmony in society for the well-being of individuals.	2	3	5M
		ii) Mention two examples of other feelings that contribute to harmonious relationships.	2	3	5M
		Unit-IV			
5	a	i) Explain the concept of self-regulation in the four orders of nature.	2	4	5M
		ii) Explain the relationship between interconnectedness and coexistence.	2	4	5M
		OR			
	b	i) Explain the significance of coexistence in realizing existence	2	4	5M
		ii) How does nature achieve self-regulation without external intervention?	2	4	5M
		Unit-V			
6	a	i) Explain the significance of humanistic education in shaping individual behavior.	2	5	5M
		ii) Discuss the main features of value-based management models.	2	5	5M
		OR			
	b	i) Outline any one strategy for transitioning toward a value-based profession.	1	5	5M
		ii) How does a humanistic constitution contribute to a universal human order?	2	5	5M

KL: Blooms Taxonomy Knowledge Level   CO: Course Outcome   M: Marks

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NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

II B.Tech I Semester Regular Examinations, December-2024 | **R23**

Sub Code: R23CE2101   NUMERICAL TECHNIQUES & STATISTICAL METHODS

Time: 3 hours   (CE)   Max. Marks: 70

Note: Question Paper consists of Two parts (Part-A and Part-B)

PART-A
Answering all the questions from Part-A is compulsory (10 x 2M = 20M)

Q.No		Questions	KL	CO	M
1	a	Explain Secant method of solving algebraic and transcendental equations.	2	1	2M
	b	State the Lagrange's interpolation formula.	1	1	2M
	c	Write the formula of Simpson's 3/8th rule.	1	2	2M
	d	Explain Picard's iteration formula.	2	2	2M
	e	A bag contains 5 white, 7 red, 6 black balls. Two balls are drawn at random. Find the probability that both will be red.	3	3	2M
	f	If X is a uniformly distributed random variable over (0, 10), find $P(X < 2)$.	3	3	2M
	g	Find the mean of the following frequency distribution	3	4	2M
	h	What are the common methods of sampling?	1	4	2M
	i	The record of weights of the male population follows the normal distribution. Its mean and standard deviations are 70 kg and 15 kg respectively. If a researcher considers the records of 50 males, then what would be the standard deviation of the chosen sample?	3	5	2M
	j	What is a One-Tailed Test?	2	5	2M

Question 1g table:

x	5	7	8	9	12
y	2	1	5	4	3

PART-B
Answer either 'a' or 'b' from each question of **PART-B** (5 x 10M = 50M)

Q.No		Questions	KL	CO	M
2		**Unit-I**			
	a	i) Find the positive root of the equation $x^3 - 5x - 7 = 0$, that lies between 2 and 3, correct to 4 places of decimals, using the method of false position.	3	1	5M
		ii) If y(10) = 35.3, y(15) = 32.4, y(20) = 29.2, y(25) = 26.1, y(30) = 23.2, y(35) = 20.5, find y(12) using Newton's forward interpolation formula.	3	1	5M
		OR			
	b	i) Find the smallest positive root of the equation $3x^3 - 9x^2 + 8 = 0$, correct to 4 places of decimals, using Newton-Raphson method.	3	1	5M
		ii) The population of a town in the census is as given in the data. Estimate the population in the year 1996 using Newton's backward interpolation formula	3	1	5M

Question 2b ii) table:

Year (x)	1961	1971	1981	1991	2001
Population (in 1000's)	46	66	81	93	101

		Unit-II			

Unit-II

3

a i) Using the data of the following table, compute the integral $\int_{0.5}^{1.1} x^2 y \, dx$ by trapezoidal rule.

x:	0.5	0.6	0.7	0.8	0.9	1.0	1.1
y:	0.4804	0.5669	0.6490	0.7262	0.7985	0.8658	0.9281

3 2 5M

ii) Solve the equation $5x\dfrac{dy}{dx}+y^2-2=0$; $y(4)=1$ for y(4.1) taking h = 0.05 and using the Euler's method.

3 2 5M

OR

b i) A river is 45 m wide. The depth d in meters at a distance x meters from one bank is given in the following data:

x:	0	5	10	15	20	25	30	35	40	45
dy:	0	3	6	8	7	7	6	4	3	0

Find the cross-section of the river by Simpson's 1/3rd rule.

3 2 5M

ii) Using Taylor's series method of the fourth order, find y at x = 1.1 and 1.2 by solving the equation $\dfrac{dy}{dx}=x^2+y^2$; $y(1)=2$.

3 2 5M

Unit-III

4

a i) There are 3 true coins and 1 false coin with 'head' on both sides. A coin is chosen at random and tossed 4 times. If 'head' occurs all the 4 times, what is the probability that the false coin has been chosen and used?

3 3 5M

ii) From a lot of 15 bulbs which include 5 defective, a sample of 4 bulbs is drawn one by one with replacement. Find the probability distribution of number of defective bulbs. Hence, find the mean of the distribution.

3 3 5M

OR

b i) If X is a continuous random variable with probability density function

$$f(x)=\begin{cases} x, & 0\le x<1 \\ \dfrac{3}{2}(x-1)^2, & 1\le x\le 2 \\ 0, & otherwise \end{cases}$$

. Find cumulative distribution function F(x) of X.

3 3 5M

ii) If X and Y are independent Poisson variables such that P(X = 1) = P(X = 2) and P(Y = 2) = P(Y = 3), find the variance of (X – 2Y).

3 3 5M

Unit-IV

5

a i) A sample of 100 measurements at breaking strength of cotton thread gave a mean of 7.4 and a standard deviation of 1.2 gms. Find 95% confidence limits for the mean breaking strength of cotton thread.

3 4 5M

ii) A certain injection administered to each of 12 patients resulted in the following increases of blood pressure: 5, 2, 8, -1, 3, 0, 6, -2, 1, 5, 0, 4
Can it be concluded that the injection will be, in general, accompanied by an increase in B.P?

3 4 5M

OR

i) Explain t-distribution and solve the following problem: The mean height and the standard deviation height of eight randomly chosen soldiers are 166.9 cm. and 8.29 cm. respectively. The corresponding values of six randomly chosen sailors are 170.3 cm and 8.50 cm respectively. Based on this data, can we conclude that soldiers are, in general, shorter than sailors?

3 4 10M

6

Unit-V

a i) The nicotine contents in two random samples of tobacco are given below:

3 5 5M

		Sample I	21	24	25	26	27				
		Sample II	22	27	28	30	31	36			

Can you say that two samples came from the same population?

			KL	CO	M
		ii) The mean breaking strength of the cables supplied by a manufacturer is 1800 with a standard deviation of 100. By a new technique in the manufacturing process, it is claimed that the breaking strength of the cable has increased. In order to test this claim, a sample of 50 cables is tested and it is found that the mean breaking strength is 1850. Can we support the claim at 1 per cent level of significance?	3	5	5M

<div align="center">OR</div>

			KL	CO	M
b	i) The following table gives the number of air-craft accidents that occurred during the various days of a week. Test whether the accidents are uniformly distributed over the week. <table><tr><td>Day:</td><td>Mon</td><td>Tues</td><td>Wed</td><td>Thu</td><td>Fri</td><td>Sat</td></tr><tr><td>Number of accidents:</td><td>15</td><td>19</td><td>13</td><td>12</td><td>16</td><td>15</td></tr></table>	3	5	5M
	ii) The standard deviation of a random sample of 1000 is found to be 2.6 and the standard deviation of another random sample of 500 is 2.7. Assuming the samples to be independent, find whether the two samples could have come from populations with the same standard deviation.	3	5	5M

KL: Blooms Taxonomy Knowledge Level   CO: Course Outcome   M: Marks

II B.Tech I Semester Regular Examinations, December-2024

R23	

Sub Code: R23CE2103

Time: 3 hours

SURVEYING

(CE)

Max. Marks: 70

Note: Question Paper consists of Two parts (Part-A and Part-B)

PART-A
Answering all the questions from Part-A is compulsory (10 x 2M = 20M)

Q.No		Questions	KL	CO	M
1	a	Mention the different types of chain	1	1	2M
	b	Define surveying	1	1	2M
	c	Define BM. Write its classification.	1	2	2M
	d	Define contour interval	1	2	2M
	e	Explain how to calculate areas for regular and irregular boundaries?	1	3	2M
	f	What are the temporary adjustment of theodolite	1	3	2M
	g	Write the importance of Drone survey	1	4	2M
	h	Write the uses of Global Positioning System	1	4	2M
	i	What is radial triangulation	1	5	2M
	j	Write briefly about Photogrammetry mapping	1	5	2M

PART-B: Answer either 'a' or 'b' from each question of PART-B (5 x 10M = 50M)

Q.No		Questions	KL	CO	M
2		**Unit-I**			
	a	i) Explain the principles of surveying?	2	1	5M
		ii) Convert the following bearings from WCB to QB i) 247°30" ii) 167°45" iii) 51°15" iv) 333°30"	3	1	5M
		OR			
	b	i) Explain clearly the points of difference between the prismatic compass and Surveyor's compass	2	1	5M
		ii) The length of a line measured with 20 m chain was found to be 372 metres. The true length of the line was known to be 371 metres. Find the error in the chain?	3	1	5M
3		**Unit-II**			
	a	i)Explain the characteristics of contours	2	2	5M
		ii)Explain the uses of contours maps	2	2	5M
		OR			
	b	i) The following perpendicular offsets were taken at 10 metres intervals from a survey line to an irregular boundary line. 3.25,5.60,4.20,6.65,8.75,6.20,3.25,4.20,5.65. calculate the area using average ordinate rule, trapezoidal rule and simpson's rule	3	2	5M

				KL	CO	M
		ii) A railway embankment is 10m wide with side slopes 2:1. Assuming the ground to be level in a direction traverse to the centerline , calculate the volume contained in a length of 150m, the central heights at 30m intervals beings 2.5,3.00,4.00,3.75, and 2.75 respectively.		3	2	5M
4		Unit-III				
	a	i) How will you measure horizontal angle using theodolite by repetition method?		2	3	5M
		ii) Explain ant two types of theodolites		2	3	5M
		OR				
	b	i) What is transit theodolite and what are the temporary adjustments in Theodolite?		2	3	5M
		ii) How will you measure horizontal angle using theodolite by reiteration method?		2	3	5M
5		Unit-IV				
	a	Discuss in detail the advantages and disadvantages of the Total Station surveying over traditional methods of surveying		2	4	10 M
		OR				
	b	i) What is the principle of Electromagnetic distance measurement?		2	4	5M
		ii) Explain about LiDAR survey		2	4	5M
6		Unit-V				
	a	i) What is aerial survey? How do you plan for flight for aerial photography?		2	5	5M
		ii) What is terrestrial photogrammetry? What are the types of terrestrial photogrammetry?		2	5	5M
		OR				
	b	i) Discuss about Stereoscopy		2	5	5M
		ii) Write a note on scale of a tilted photograph		2	5	5M

KL: Blooms Taxonomy Knowledge Level   CO: Course Outcome   M: Marks

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II B.Tech I Semester Regular Examinations, December-2024

R23

Sub Code: R23CE2104   **STRENGTH OF MATERIALS**

Time: 3 hours   (CE)   Max. Marks: 70

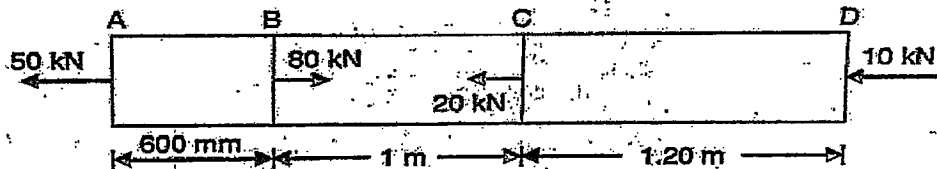Note: Question Paper consists of Two parts (Part-A and Part-B)

PART-A
Answering all the questions from Part-A is compulsory (10 x 2M = 20M)

Q.No		Questions	KL	CO	M
1	a	Define elasticity and plasticity?	1	1	2M
	b	State Hooke's law with equation?	1	1	2M
	c	What are the types of supports?	1	2	2M
	d	Write the classification of beams?	1	2	2M
	e	Define bending and shear stress	1	3	2M
	f	What is neutral layer and neutral axis?	1	3	2M
	g	What is deflection of beam?	1	4	2M
	h	What causes deflection of beam?	1	4	2M
	i	Define Slenderness ratio	1	5	2M
	j	Define thin cylinder and thick cylinder?	1	5	2M

PART-B
Answer either 'a' or 'b' from each question of **PART-B** (5 x 10M = 50M)

Q.No		Questions	KL	CO	M
		Unit-I			
2	a	i) A circular rod of diameter 20 mm and 500 mm long is subjected to a tensile force of 45 KN. the modulus of elasticity for the material is 2.1×10^5 N/mm². Find the stress, strain & the elongation of circular rod.	3	1	5M
		ii) A brass bar, having cross-sectional area of 1000 mm² ,is subjected to axial forces as shown in figure. Find the total elongation of the bar. Take $E = 1.05 \times 10^5$ N/mm²	3	1	5M
		OR			
	b	A steel rod of 3 cm diameter is enclosed centrally in a hollow copper tube of external diameter 5cm and internal diameter of 4cm. the composite bar is then subjected to an axial pull of 45000N.if the length of each bar is equal to 15 cm, determine: i) The stresses in the rod and tube, and (ii) Load carried by each bar	3	1	10 M

		Unit-II			
3	a	A simply supported beam of length 8 m carries point load of 4 KN and 7 KN at distances 3 m and 6 m from the left end. Draw SFD and BMD for the beam	3	2	10 M
		OR			
	b	A cantilever of length 3 m carries a uniformly distributed load of 1.5 KN/m run over a length of 2 m from the free end. Draw SFD and BMD for the beam	3	2	10 M
4		**Unit-III**			
	a	A simply supported beam carries a uniformly distributed load of intensity 30 N/mm over the entire span of 2 m. The cross section of beam is a T-section having flange 125 x 25 mm and web 175 x 25 mm. Calculate the maximum shear stress for the section subjected to maximum shear force. Also draw the shear stress distribution	3	3	10 M
		OR			
	b	A beam is simply supported and carries a uniformly distributed load of 40KN/m run over the whole span. The section of the beam is rectangular having depth as 500mm. If the maximum stress in the material of the beam is 120 N/mm^2 and moment of inertia of the section is 7 x 10^{8}mm^4 , find the span of the beam.	3	3	10 M
5		**Unit-IV**			
	a	i) A cantilever of length 4 m carries a uniformly distributed load 3 KN/m over a length of 1.5 m from the free end and a point load of 2 KN at the free end. Find the slope and deflection at the free end if E = 2.1 x 105 N/mm2 and I = 6.667 x 107 mm^4.?	3	4	10 M
		OR			
	b	Determine the deflections at points C, D and E in the beam shown in the figure. Take E=200KN/mm^2 and I=60 x10^{6}mm^4	3	4	10 M
6		**Unit-V**			
	a	i) Explain about Euler's crippling load theory	2	5	5M
		ii) Write the Limitations of Euler's theory	2	5	5M
		OR			
	b	Determine the maximum and minimum hoop stress across the section of a pipe of 400 mm internal diameter and 100 mm thick, when the pipe contains a fluid at a pressure of 8 N/mm^2. Also sketch the radial pressure and hoop stress distribution across the section	3	5	10 M

KL: Blooms Taxonomy Knowledge Level   CO: Course Outcome   M: Marks

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2

Note: Question Paper consists of Two parts (Part-A and Part-B)

PART-A

Answering all the questions from Part-A is compulsory (10 x 2M = 20M)

Q.No		Questions	KL	CO	M
1	a	Differentiate kinematic and dynamic viscosity.	K2	1	2M
	b	What is capillarity?	K1	1	2M
	c	State Pascal's law.	K1	2	2M
	d	Define buoyancy.	K1	2	2M
	e	List out the types of flow.	K1	3	2M
	f	Compare Laminar flow and turbulent flow.	K2	3	2M
	g	Write the assumptions made in the derivation of Bernoulli's equation.	K1	4	2M
	h	What is vortex flow?	K1	4	2M
	i	Differentiate major and minor head loss.	K2	5	2M
	j	Distinguish between pipes in parallel and series.	K2	5	2M

PART-B: Answer either 'a' or 'b' from each question of **PART-B** (5 x 10M = 50M)

Q.No		Questions	KL	CO	M
2		Unit-I			
	a	Calculate the capillary effect in millimeters a glass tube of 4 mm diameter, when immersed in (a) water (b) mercury. The temperature of the liquid is 20°C and the values of the surface tension of water and mercury at 20°C in contact with air are 0.073575 N/m and 0.51 N/m respectively. The angle of contact for water is 0°c and that for mercury 130°C. Take specific weight of water as 9790 N/m³.	K3	1	10M
		OR			
	b	(i) Determine the bulk modulus of elasticity of a liquid, if the pressure of the liquid is increased from 7 MN/m² to 13 MN/m², the volume of liquid decreases by 0.15%. (ii) Determine the mass density, specific volume and specific weight of a liquid whose specific gravity 0.85.	K3	1	10M
3		Unit-II			
	a	A rectangular plate 0.6m wide and 1.2 m deep lies within a water body such that its plane is inclined at 45 degree to the horizontal and the top edge is 0.70 m below the water surface. Determine the total pressure on one side of the plate and the location of the centre of pressure.	K3	2	10M

			KL	CO	M
		OR			
	b	A U - Tube manometer is used to measure the pressure of water in a pipe line, which is in excess of atmospheric pressure. The right limb of the manometer contains mercury and it is open to atmosphere. The contact between water and mercury is in the left limb. Determine the pressure of water in the main line, if the difference in level of mercury in the limbs of U-tube is 10 cm and the free surface of mercury is in level with the centre of the pipe. If the pressure of water in pipe line is reduced to 9810 N/m². Calculate the new difference in the level of mercury. Sketch the arrangement in both cases.	K3	2	10M
4		**Unit-III**			
	a	If for a two-dimensional potential flow, the velocity potential function is given by $\phi = x(2y-1)$, determine the velocity at the point P (4,5). Determine also the value of stream function (Ψ) at the point P.	K3	3	10M
		OR			
	b	The velocity component for a two-dimensional incompressible flow are given by u= 3x–2y and v= -3y–2x. Show that the velocity Potential exists. Determine the velocity potential function and stream function.	K3	3	10M
5		**Unit-IV**			
	a	A venturimeter of inlet diameter 300 mm and throat diameter 150 mm is inserted in vertical pipe carrying water flowing in the upward direction. A differential mercury manometer connected to the inlet and throat gives a reading of 200 mm. Find the discharge if the coefficient of discharge of meter is 0.98.	K3	4	10M
		OR			
	b	An orifice meter with orifice diameter 15 cm is inserted in a pipe of 30 cm diameter. The pressure difference measured by a mercury oil differential manometer on the two sides of the orifice meter gives a reading of 50 cm of mercury. Find the rate of flow of oil of sp.gr 0.9, when the coefficient of discharge of the orifice meter = 0.64.	K3	4	10M
6		**Unit-V**			
	a	Two pipes of diameter 400 mm and 200 mm are each 300 m long. When the pipes are connected in series the discharge through the pipeline is 0.10 m³/sec, Estimate the loss of head incurred. What would be the loss of head in the system to pass the same total discharge when the pipes are connected in parallel. Take friction factor = 0.0075 for each pipe.	K3	5	10M
		OR			
	b	A horizontal pipe line 40 m long is connected to a water tank at one end discharges freely into the atmosphere at the other end. For the first 25 m of its length from the tank, the pipe is 150 mm diameter and its diameter is suddenly enlarged to 300 mm. The height of water level in the tank is 8 m above the centre of the pipe. Considering all losses of head which occur. Calculate the rate of flow. Take Darcy's co-efficient of friction as 0.01 for both sections of the pipe.	K3	5	10M

KL: Blooms Taxonomy Knowledge Level   CO: Course Outcome   M: Marks