R-19

Code: 19A141T

II B.Tech. II Semester Regular Examinations August 2021
Building Planning & Environment
(Civil Engineering)

Max. Marks: 70   Time: 3 Hours
Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)
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			Marks	CO	Blooms Level
		UNIT–I			
1.	a)	Explain the importance of wall thickness in byelaws of buildings	7M	CO1	L2
	b)	Explain the consideration of the height of buildings as per building bye-laws	7M	CO1	L2
		OR			
2.	a)	Explain the objectives of building byelaws	7M	CO1	L2
	b)	Explain the principles of building byelaws	7M	CO1	L2
		UNIT–II			
3.	a)	Explain in detail the various requirements of different rooms and their grouping.	7M	CO2	L2
	b)	Explain clearly different principles involved in planning a residential building.	7M	CO2	L2
		OR			
4.		Write short notes on: (a) Characteristics of various types of residential building (b) Architectural Principle	14M	CO2	L2
		UNIT–III			
5.	a)	Explain in detail with neat sketch about planning of bank building.	9M	CO3	L2
	b)	Write the importance and necessity in planning of hospitals.	5M	CO3	L2
		OR			
6.	a)	Write the importance and necessity in planning of educational institutes.	9M	CO3	L2
	b)	Write the importance and necessity in planning of dispensaries	5M	CO3	L2
		UNIT–IV			
7.	a)	Explain the importance of computations of time and float and explain the phenomenon.	10M	CO4	L4
	b)	Explain CPM and PERT network plan	4M	CO4	L2
		OR			
8.	a)	Describe the features and uses of network planning in detail.	7M	CO4	L2
	b)	Describe the BAR CHART and the limitations of a bar chart with an example	7M	CO4	L2
		UNIT–V			
9.		Explain the impact of construction on the environment	14M	CO5	L2
		OR			
10.		Explain the terms: I.Heat balance II.Human Physiology III.Metabolism IV.Clothing	14M	CO5	L2

END

Code: 19A142T

R-19

II B.Tech. II Semester Regular Examinations August 2021
Concrete Technology
(Civil Engineering)

Max. Marks: 70   Time: 3 Hours
Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)
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		Marks	CO	Blooms Level

UNIT–I

1. a)	Describe the Bogue chemical compound composition of Portland Cement.	7M	CO1	L2
b)	Describe the hydration reaction of important Bogue compounds indicating the products of hydration.	7M	CO1	L2

OR

2.	How are aggregates classified? Define fineness modulus. Give the practical range of fineness modulus values for coarse and fine aggregates.	14M	CO1	L2

UNIT–II

3.	What are the various factors which affect the workability of concrete?	14M	CO2	L4

OR

4.	What are the tests carried out in the fresh stage of self-compaction concrete to determine its properties? Explain any three of them with neat sketches.	14M	CO2	L4

UNIT–III

5.	Define curing. What are the various methods used for curing of concrete?	14M	CO3	L4

OR

6.	Define dynamic modulus of concrete. How can the dynamic modulus of concrete be determined?	14M	CO3	L2

UNIT–IV

7.	Design a concrete mix as per IS 10262: 2009, for the following data: Characteristic strength f_{ck} at 28 days: 20 N/mm². Cement to be used: Ordinary Portland, Workability = low, Coarse aggregate: 20 mm, Fine aggregate = Natural Sand. Specific gravity of fine aggregate = 2.7. Specific gravity of coarse aggregate = 2.8.	14M	CO4	L4

OR

8.	List the methods used for mix proportioning indicating the drawbacks of each method.	14M	CO4	L4

UNIT–V

9. a)	What is the significant difference between mixture proportioning of normal weight concrete and light weight concrete?	10M	CO5	L5
b)	What are the typical ranges of aggregate unit weight for making structural light weight concrete? Explain.	4M	CO5	L5

OR

10.	List the applications of fibre-reinforced concrete. What are the basic properties of fibre reinforced concrete which can be advantageously made use of in the design of structural elements?	14M	CO5	L5

END

Code: 19A144T

II B.Tech. II Semester Regular Examinations August 2021
Hydraulics Engineering
(Civil Engineering)

Max. Marks: 70   Time: 3 Hours
Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)
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		Marks	CO	Blooms Level

UNIT–I

1. a)	Discuss the phenomenon of separation for flow over curved surfaces, what are the methods used to prevent the separation	7M		L2
b)	How will you determine whether a boundary layer flow is attached flow	7M		L1

OR

2. a)	What do you understand by displacement & momentum thickness	7M		L2
b)	The velocity distribution in a boundary layer is $\frac{u}{U} = 2\left(\frac{y}{\delta}\right) - \left(\frac{y}{\delta}\right)^2$. Prove that $\frac{\delta^*}{\delta} = \frac{1}{3}$	7M		L3

UNIT–II

3.	For the most economical section of a trapezoidal section prove that M = H/2, Half of top width = length of one of the sloping side	14M		L5

OR

4.	Define specific energy and draw the specific energy diagram. Explain how it is useful for the open channel flow.	14M		L5

UNIT–III

5. a)	A jet of water strikes a fixed flat plate with a velocity V. Which is inclined at ϕ to the jet direction. Prove that Fn = ρaV² sinϕ	7M		L4
b)	A jet of water coming out of a nozzle of 10cm diameter with a velocity of 40m/sec Strikes a flat plate find the work done, power developed	7M		L4

OR

6.	A jet of water strikes to a moving blade which has a velocity of 10m/sec. The jet enters the blade at an angle 30º and leaves at 160º to the direction of blade motion. Find the absolute velocity of jet at the entry and exit.	14M		L5

UNIT–IV

7.	A Kaplan turbine develops 11mW under a head of 4.3m. Find the diameter and speed of the runner. Take speed ratio = 1.8, flow ratio = 0.5, Db = 0.35 Do and η_o = 0.9	14M		L5

OR

8. a)	What do you understand by modeling? What are the required conditions for model testing?	7M		L2
b)	What are constant efficiency curves?	7M		L2

UNIT–V

9.	A multistage pump is to be designed to like the water through a total head of 140M, when running at 1000 rpms delivered 0.2m³/sec of water. Find the number of stages required when specific speed of each stage is 30.	14M		L6

OR

10. a)	Explain the direct & indirect benefits of a hydroelectric power plants	7M		L2
b)	How can you classify the hydroelectric power plants?	7M		L2

END

Code: 19AE41T

R-19

II B.Tech. II Semester Regular Examinations August 2021
Managerial Economics and Financial Accounting
(Common to CE & ME)

Max. Marks: 70   Time: 3 Hours
Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)
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			Marks	CO	Blooms Level

UNIT–I

			Marks	CO	Blooms Level
1.	a)	Discuss the nature and scope of Managerial economics. Identify its nature through its definitions.	7M	1	L1
	b)	Describe the various factors involved in Demand forecasting of a product	7M	1	L2

OR

2.	a)	What is managerial economics? Explain its relation with the other subjects.	7M	1	L1
	b)	Outline the significance of demand forecasting methods. State Regression method of demand forecasting.	7M	1	L4

UNIT–II

3.	a)	State Iso-quants and Iso-costs and their characteristics	7M	2	L3
	b)	What are the managerial uses of breakeven analysis?	7M	2	L1

OR

4.	a)	Explain the Law of returns to scale. State how it indicates production behaviour.	7M	2	L2
	b)	Determine BEP, P/V Ratio and Sales level for a profit of Rs.15.00 Lakhs, if Fixed Cost is Rs.25.00 Lakhs, Sales is Rs.175.00 Lakhs and Variable Cost is Rs.170.00 Lakhs.	7M	2	L3

UNIT–III

5.	a)	Define markets and describe the features of perfect competition.	7M	2	L1
	b)	Differentiate the features of Monopolistic & Oligopolistic Markets.	7M	2	L2

OR

6.	a)	Distinguish between monopolistic and oligopolistic markets.	7M	2	L2
	b)	Differentiate features of Private Limited Company to that of Public Limited Company?	7M	2	L2

UNIT–IV

7.	a)	Define Capital and outline its significance in financial management	7M	3	L4
	b)	Compare merits & demerits of Pay Back Period & Accounting Rate of Return Methods	7M	3	L5

OR

8.	a)	Summarise the various sources of raising capital	7M	3	L2
	b)	Determine the average rate of return for a period for a project which requires - Cash- outlay of Rs.10,000 and generates cash inflows of Rs.2,000, Rs.4,000, Rs.3,000and Rs.2, 000 in the first, second, third, and fourth year respectively	7M	3	L2

UNIT–V

9. a) Define accounting. What do you understand by Double Entry System of book-keeping?

7M 3 L2

b) Identify the Ratios that are used to find the soundness and strength of long-term financial position of a firm.

7M 3 L1

OR

10. From the following Trial Balance, prepare final accounts of M/s Janardhan enterprises as on 31-03-2021. Taking into account the following adjustments.

a) Closing stock Rs. 4000

b) Prepaid salaries Rs. 300

c) Bad Debts Rs. 500

d) Reserve for Bad debts 5%

e) Depreciation of Premises 5% .

Trial Balance of M/s Janardhan Enterprises

Particulars	Amount (Rs.)	Amount (Rs.)
Opening stock	1000	20000
Purchases	4000	200
Sales Returns	500	6000
Carriage inwards	600	600
Wages	700	
Salaries	1000	
Interest	300	
Trade expenses	400	
Debtors	8000	
Bad debts	300	
Business premises	6000	
Bills receivable	4000	
total	**26800**	**26800**

14M 3 L2

END

R-19

Code: 19AC41T

II B.Tech. II Semester Regular Examinations August 2021
Numerical Methods & Probability and Statistics
(Common to CE & ME)

Max. Marks: 70   Time: 3 Hours
Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)
****

	Marks	CO	Blooms Level

UNIT–I

1. a) Determine a root correct to three decimal places for the equation $x^3-x-2=0$ using Newton Raphson method. — 7M CO1 L3

   b) Find the polynomial ̀ect to y using Lagrange's formula and hence find $=0$ from the following data. $f(5)$

	1	3	4	6
	648	704	729	792

   7M CO1 L1

   OR

2. a) Find the root of the equation $e^x = Sin x$ using the bisection method correct to three decimal places. — 7M CO1 L1

   b) Estimate the value of $f(1.5)$ and $f(7)$ from the following data

	1	2	3	4	5
	1	2.5	3.2	4.1	5.6

   7M CO1 L2

UNIT–II

3. a) Apply Runge-Kutta method of fourth order to find an approximate value of y at $x = 0.2$, given that $\frac{dy}{dx} = \frac{y-x}{y+x}$, $y(0) = 1$ and $h = 0.2$. — 7M CO2 L3

   b) Find $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ at $x = 1.2$ for the following data

	1.0	1.1	1.2	1.3	1.4	1.5
	6.691	7.213	7.632	8.435	9.214	9.834

   7M CO2 L1

   OR

4. a) Evaluate $\int_0^6 \frac{1}{x^2+1} dx$ by using (i) Trapezoidal rule, (ii) Simpson's 1/3 rule. — 7M CO2 L3

   b) Apply modified Euler's method to obtain y at $x = 0.1, 0.2, 0.3$ from $y' = 1 - y$, $y(0) = 0$. — 7M CO2 L3

UNIT–III

5. a) X is a continuous random variable with probability density function given by $f(x) = \begin{cases} kx, & 0 \le x < 2 \\ 2k, & 2 \le x < 4 \\ -kx + 6k, & 4 \le x < 6 \end{cases}$ then

   Find i) k, ii) mean iii) variance — 7M CO3 L1

   b) Fit a Poisson distribution to the following data given the number of yeast cells per square for 400 squares:

No. of. Cells per sq:	0	1	2	3	4	5	6	7	8	9	10
No. of squares	103	143	98	42	8	4	2	0	0	0	0

   7M CO3 L2

   OR

6. a) A random variable *x* has the probability function

x	0	1	2	3	4	5	6
P(x)	2k	3k	6k	7k	8k	11k	12k

(i) Find the value of the k, (ii) Evaluate $P(X < 4)$, $P(X \geq 3)$.   7M   CO3   L3

   b) The mean height of 500 students is 151 cm. and the standard deviation is 15 cm. Assuming that the heights are normally distributed, find how many students' heights lie between 120 and 155 cm.   7M   CO3   L2

UNIT–IV

7. a) One type of aircraft is found to develop engine trouble in 5 flights out of a total of 100 and another type in 7 flights out of a total of 200 flights. Is there a significant difference in the two types of aircrafts so far as engine defects are concerned?   7M   CO4   L4

   b) If in a random sample of 600 cars making a right turn at a certain trafic junction 157 drove into the wrong lane, test whether actually 30% of all drivers make this mistake or not at this given junction. Use 0.05 level of significance..   7M   CO4   L4

OR

8. a) If random sample data show that 42 men earn on the average x_1 = 744.85 with s.d. s_1 = 397.7 while 32 women earn on the average x_2 = 516.78 with s.d. s_2=162.523, test at 0.05 level of significance whether the average income for men and women is same or not.   7M   CO4   L4

   b) Out of two vending machines at a 'super bazar', the first machine fails to work 13 times in 250 trials and second machine fails to work 7 times in 250 trials. Test at 0.05 level of significance, whether the difference between the corresponding sample proportions is significant.   7M   CO4   L4

UNIT–V

9. a) A machinist is making engine parts with axle diameter of 0.7 inch. A random sample of 10 parts shows mean diameter 0.742 inch with a standard deviation of 0.04 inch. On the basis of this sample, would you say that the work is inferior?   7M   CO5   L2

   b) Marks obtained in mathematics by 11 students before and after intensive coaching are given below:

Before	24	17	18	20	19	23	16	18	21	20	19
After	24	20	22	20	17	24	20	20	18	19	22

Test at 0.05 L.O.S. whether the intensive coaching is useful?   7M   CO5   L2

OR

10. The household net expenditure on health care in south and north India, in two samples of households, expressed as percentage of total income is shown the following table

South	15.0	8.0	3.8	6.4	27.4	19.0	35.3	13.6	
North	18.8	23.1	10.3	8.0	18.0	10.2	15.2	19.0	20.2

Test the equality of variances of household's net expenditure on health care in south and north India.   14M   CO5   L2

END

Code: 19A143T

II B.Tech. II Semester Regular Examinations August 2021

Strength of Materials

(Civil Engineering)

Max. Marks: 70   Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

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		Marks	CO	Blooms Level

UNIT–I

1. A steel cylinder with an inside diameter of 200 mm and an outside diameter of 300 mm is subjected to an internal pressure of 70 MPa. Determine (i) The maximum tensile stress in the cylinder. (ii) The radial and tangential stresses at a point midway the cylinder wall.   **14M**   CO1   2

OR

2. A compound thick cylinder is fabricated by shrinking and fitting a steel jacket of 300 mm diameter on to a steel tube of 100 mm inside diameter and 200 mm outside diameter. The radial interference was 0.1 mm. Take $E = 210 \times 10^3$ MPa. (a) Determine the contact pressure. (b) Determine the maximum tensile stress in the compound cylinder. (c) If an internal pressure of 280 MPa is applied what will be the maximum tensile stress. (d) Compare the stress distribution in this compound cylinder with the stress distribution in a uniform cylinder for an internal pressure of 280 MPa.   **14M**   CO1   2

UNIT–II

3. a) A pump designed for remote area is to be powered by humans. The maximum power through the drive shaft is 0.1 H.P. when it rotates at 100 rpm. (i) What will be the diameter of the shaft if the maximum permissible shearing stress is $100 MN/m^2$. (ii) At a later time, electric power becomes available so that an electric motor is planned to drive the same pump. What should be the power rating of the motor if the shaft will be rotating at 2000 rpm.   **7M**   CO2   2

   b) **A** hollow circular shaft is of 180 mm internal diameter and thickness 10 mm. Find the maximum stress in the shaft if the torque is 12,000Nm.   **7M**   CO2   2

OR

4. a) A closely coiled helical spring is made of 12.5 mm diameter steel wire and its ten coils have a mean diameter of 250 mm. Find the elongation, intensity of torsional and shearing stresses and strain energy per cubic cm when the spring carries an axial load of 180 N. ($G = 84 \times 10^3$ MPa).   **7M**   CO2   1

   b) Find the axial twist, intensity of bending stress and work stored per c.c. in the spring of question number 4(a), if an axial torque of 14 N-m is applied. E=210MPa.   **7M**   CO2   2

UNIT–III

5. Derive an Euler's load expression for the column with one end fixed and the other end hinged..   **14M**   CO3   3

OR

6. For a fixed ended hollow cast iron column of length of 4.6 m and outer diameter 250 mm, calculate the thickness of column which is required to carry a load of 1000 kN. Rankine formula is to be used with permissible stress of 80 MPa and constant value is (1/6400).   14M   CO3   2

UNIT–IV

7. A beam of rectangular section of 80mm to 120mm carries a uniformly distributed load of 40 kN/m over a span of 2 m and an axial compressive force of 10kN. Calculate(i) maximum fibre stress, (ii) fibre stress at a point 0.50 m from the left end of the beam and 40 mm below the neutral axis.   14M   CO4   2
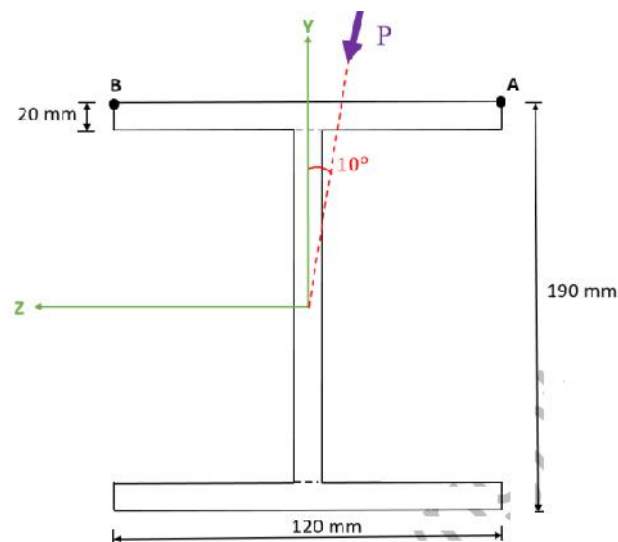
OR

8. A short hollow pier 1.6mx 1.6m outsides and 1.0m x 1.0m inner sides supports a vertical load of 2000kN at a point located on a diagonal 0.5m from the vertical axis of the pier. Calculate the normal stresses at the 4 corners of the section of the pier, neglecting its self-weight   14M   CO4   2

UNIT–V

9. What is unsymmetrical bending? Explain how to determine bending stress at any point in a given cross-section, under unsymmetrical bending. List the consequences of unsymmetrical bending.   14M   CO5   1

OR

10. Find the stresses on the cantilever beam (load of 1kN at the free end and the length of beam is 3m) of I section shown in the figure. The load acts at angle of 10° from the vertical axis.

14M   CO5   3

END