Hall Ticket Number :										

R-19

Code: 19A144T

II B.Tech. II Semester Supplementary Examinations July/August 2022

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)	Define laminar boundary layer, turbulent boundary layer	6M	1	1
	b)	What is meant by laminar sub-layer and boundary layer thickness (δ)	8M	1	1
		OR			
2.		Derive equation for displacement thickness (δ^*)	14M	1	1
		UNIT–II			
3.		For a trapezoidal channel with bottom width 40 m and side slopes 2H:1V Manning's N is 0.015 and bottom slope is 0.0002. If it carries 60 m^3/s, Determine the normal depth.	14M	2	2
		OR			
4.	a)	Explain the terms specific energy and critical depth.	6M	2	1
	b)	Find the specific energy of flowing water through a rectangular channel of width 5 m when the discharge is 10 m^3/s and depth of water is 3 m.	8M	2	2
		UNIT–III			
5.		Derive the force exerted by the jet on stationary vertical plate	14M	3	2
		OR			
6.		A Jet of water of diameter 50 mm moving with velocity of 40 m/s, strikes a curved fixed symmetrical plate at the centre. Find the force exerted by the jet of water in the direction of the jet, if the jet is deflected through an angle of 120^o at the outlet of the curved plate.	14M	3	2
		UNIT–IV			
7.	a)	Explain about classification of hydraulic turbines	4M	4	1
	b)	Explain about main parts of the Pelton turbine with a neat sketch	10M	4	1
		OR			
8.	a)	Explain specific speed	4M	4	1
	b)	A turbine develops 9000 KW when running at a speed of 140 r.p.m. and under a head of 30 m. Determine the specific speed of turbine.	10M	4	2
		UNIT–V			
9.		A centrifugal pump is to discharge 0.118 m3/s at a speed of 1450 r.p.m. against a head of 25 m. The impeller diameter is 250 mm, its width at outlet is 50 mm and manometric efficiency is 75%. Determine the vane angle t the outer periphery of the impeller	14M	4	2
		OR			
10.	a)	What is the difference between single stage and multi stage centrifugal pumps	6M	4	1
	b)	Explain about pumps in series and parallel	8M	4	1

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Hall Ticket Number :										

R-19

Code: 19AC41T

II B.Tech. II Semester Supplementary Examinations July/August 2022

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)

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		Marks	CO	Blooms Level
	UNIT–I			
1.	Estimate the value of f(22) and f(42) from the following available data x: 20, 25, 30, 35, 40, 45 f(x): 354, 332, 291, 260, 231, 204	14M	CO1	L2
	OR			
2.	Find a positive root of $x^3 - x - 1 = 0$ correct to two decimal places by Bisection method.	14M	CO1	L3
	UNIT–II			
3.	Given that x: 1.0, 1.1, 1.2, 1.3, 1.4, 1.5, 1.6 y: 7.989, 8.403, 8.781, 9.129, 9.451, 9.750, 10.031 find $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ at (a) x=1.1 (b) x=1.6	14M	CO2	L1
	OR			
4.	Using Taylor series method, find an approximate values of y(1.1) and y(1.2) for the differential equation $\frac{dy}{dx} = x + y, y(1) = 0.$	14M	CO2	L3
	UNIT–III			
5.	Two dice are thrown, let X assign to each point (a, b) in S the maximum of its numbers i.e., X (a, b) = max (a, b). Find the probability distribution and also find the mean and variance of the distribution.	14M	CO3	L1
	OR			
6.	If a random variable has a Poisson distribution such that P(1) = P(2), find (i) Mean, (ii) P(4), (iii) P(x≥1), and (iv) p(1<x<4).	14M	CO3	L3
	UNIT–IV			
7.	A die was thrown 9000 times and of these 3220 yielded a 3 or 4. Is this consistent with the hypothesis that the die was unbiased?	14M	CO4	L1
	OR			
8.	A sample of 400 items is taken from a population whose standard deviation is 10. The mean of the sample is 40. Test whether the sample has come from a population with mean 38. Also calculate 95% confidence interval for the population.	14M	CO4	L3
	UNIT–V			
9.	A group of 5 patients treated with medicine A weight 42,39,48,60 and 41 kgs. Second group of 7 patients from the same hospital treated with medicine B weight 38, 42, 56, 64, 68, 69 and 62kgs. Do you agree with the claim that the medicine B increases the weight significantly?	14M	CO5	L1
	OR			
10.	The number of automobiles accidents per week in a certain community are as follows : 12,8,20,2,14,10,15,6,9,4. Are these frequencies in agreement with the belief that accident conditions were the same during this 10 week period?	14M	CO5	L1

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Hall Ticket Number :										

R-19

Code: 19A143T

II B.Tech. II Semester Supplementary Examinations July/August 2022

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.		Relation between thin and thick cylindrical shells. Illustrate the various stresses acting in thin cylindrical shell?	14M	1	3
		OR			
2.	a)	A Spherical shell of 1m diameter is subjected to an internal pressure of 1.2N/mm^2 .Taking the maximum allowable stress as 100 N/mm^2. calculate the necessary thickness of the plate. Take joint efficiency at 75%	7M	1	2
	b)	Find an expression for the change in the volume of a thin cylindrical shell subjected to internal fluid pressure.	7M	1	4
		UNIT–II			
3.	a)	What are the assumptions made in the theory of pure torsion?	4M	2	2
	b)	Derive the basic torsion equation T/J = fs/R = cθ/l.	10M	2	4
		OR			
4.	a)	A leaf spring carries a central load of 2.5 KN. The leaf spring is to be made of 10 steel plates 6 cm wide and 5 mm thick. If the bending stress is limited to 100 N/mm^2 , determine length of the spring and deflection at the centre of the spring. Take E=2×105 N/mm^2 .	14M	2	4
		UNIT–III			
5.	a)	Derive Rankine's formula applied to medium columns.	4M	3	3
	b)	Determine the crippling load for a T–section of dimensions 10cm X 10cm X 2cm and length 5m, when it is used as a strut with both ends fixed. Take E=2X105 N/mm^2.	10M	3	4
		OR			
6.		Derive Secant formula. Hence deduce Perry's formula for eccentrically loaded columns.	14M	3	2
		UNIT–IV			
7.	a)	Find an expression for the maximum and minimum stresses when a rectangular column is subjected to a load, which is eccentric to Y-Y axis	7M	4	2
	b)	What is Core of a section? Derive the expression for a rectangular hollow section	7M	4	2
		OR			
8.		A short column of rectangular cross section 25 cm X 20 cm carries a load of 400 kN at a point 5 cm from the longer side and 10 cm from the shorter side. Determine the maximum tensile and compressive stresses in the column.	14M	4	5
		UNIT–V			
9.		A beam of rectangular section 100 mm wide and 150mm deep is subjected to bending moment of 15 KNm. The trace of the plane of loading is inclined at 450 to the Y-Y axis of the section. Locate the neutral axis of the section and calculate maximum bending stress induced in the section	14M	5	4
		OR			
10.		Find the centroidal principal moments of inertia of an I-section 50mmX4mm top flange, 70 mm X 4 mm bottom flange, and 60 mm X 4 mm web. Also find the direction of principal axes of inertia.	14M	5	3

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R-19

Code: 19A141T

II B.Tech. II Semester Supplementary Examinations July/August 2022

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.	Recall the objectives of Building Bye-Laws.	14M	1	L2
	OR			
2.	Write a short note on Carpet area, plinth area and Built up area.	14M	1	L2
	UNIT–II			
3.	Recall the minimum standards of I. Habitatble room II. Kitchen & III. Bath room and water closet	14M	2	L2
	OR			
4.	Write down the factors to be considered while selecting suitable site for a residential building.	14M	2	L2
	UNIT–III			
5.	Elaborate various factors to be considered while planning office bulding.	14M	3	L2
	OR			
6.	Elaborate various factors to be considered while planning hotel and motel.	14M	3	L2
	UNIT–IV			
7.	Paraphrase various steps involved in planning of a construction projects.	14M	4	L2
	OR			
8.	A project consists of the following activities: Activity: 10-20,10-30,20-40,30-40,20-50,40-50 Duration(Weeks): 13,12,2,8.15,2 Draw the network diagram. Calculate total and free floats for the activities. Mark the critical path.	14M	4	L3
	UNIT–V			
9.	Elaborate various thermal comfort standards.	14M	5	L2
	OR			
10.	Recall the impact of buildings on ozone depletion.	14M	5	L2

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Hall Ticket Number :										

R-19

Code: 19A142T

II B.Tech. II Semester Supplementary Examinations July/August 2022

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.	Illustrate how hydration happens in cement with suitable chemical reactions.	14M	CO1	L2
	OR			
2.	Distinguish between well graded and gap graded aggregates.	14M	CO1	L2
	UNIT–II			
3.	Discuss compressive strength test of concrete?	14M	CO2	L2
	OR			
4.	Discuss the factors affecting strength of concrete.	14M	CO2	L2
	UNIT–III			
5.	Define shrinkage and explain different types of shrinkages in concrete.	14M	CO3	L1
	OR			
6.	Explain modulus of elasticity, Poisson's ratio, dynamic modulus of elasticity of concrete.	14M	CO3	L1
	UNIT–IV			
7.	Describe quality control of concrete and statistical methods?	14M	CO4	L1
	OR			
8.	Discuss briefly about ACI code method of concrete mix proportioning?	14M	CO4	L1
	UNIT–V			
9.	Discuss high density concrete. Write advantages and disadvantages	14M	CO5	L2
	OR			
10.	Discuss no fines concrete and its applications	14M	CO5	L2

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