Code: 5G655

III B.Tech. I Semester Supplementary Examinations February 2021

Design and Drawing of Reinforced Concrete Structures

(Civil Engineering)

Max. Marks: 70   Time: 3 Hours

Use of IS 456:2000 and SP 16 Design aided charts books are permitted in the examination hall

PART-A

(Answer any one question)   *1x28=28 marks*

		Marks	CO	Blooms Level
1.	Simply supported RCC slab has to be provided for the roof of clear dimensions 3 m X 8 m. Width of supporting wall is 300 mm. The weight of weathering course over the slab is 1.0kN/m². Design the slab using M20 grade of concrete and HYSD bars. Check the design for stiffness and also sketch the reinforcement details.	28M	3	5

OR

		Marks	CO	Blooms Level
2.	Design a rectangular isolated flat footing for a column of size 300 mm × 450 mm, carrying an axial load of 1600 kN. The S.B.C. of the soil is 350kN /m^2. Use M 25 and Fe 415. Sketch the plan and sectional elevation of the footing showing the reinforcement details.	28M	5	5

PART – B

(Answer any three questions)   *3x14=42 marks*

			Marks	CO	Blooms Level
3.	a)	Explain the various modes of failures of beams.	7M	1	2
	b)	Calculate the stress block parameters of a singly reinforced rectangular section from the basic principles.	7M	1	3
4.		Determine the moment of resistance of a singly reinforced concrete beam of rectangular section 230 mm wide and 430 mm deep (effective depth), reinforced with 4 bars of 16 mm dia , use M20 grade of concrete and Fe 415 grade of steel, redesign the beam if necessary.	14M	2	3
5.		Design a two way slab for a room 4000 mm x 3500mm clear in size, if the super imposed load is 3 kN / m² and floor finish of 1 kN / m². The edges of the slab are simply supported and corners are not held down. Use M20 and Fe 415. And also sketch the rough reinforcement details	14M	3	5
6.		Determine the reinforcement required in a column of 230 mm x 450 mm subjected to an axial factored load of 1100 kN and a factored moment of 28kN-m about shorter axis. Adopt M20 and Fe415 and assume two sides (shorter sides) reinforcement.	14M	4	3
7.		A rectangular cantilever beam is of span 3.6 m and 300 mm x 500 mm in cross section. The beam is subjected to a service load of 12 kN/m in addition to its self-weight. It may be assumed that 45% of the total moment is due to permanent loads. The beam is reinforced with 4 no. of 20 mm diameter on the tension side. Check the beam for deflection. Adopt M 25 and Fe 415.	14M	5	3

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Code: 5G654

III B.Tech. I Semester Regular & Supplementary Examinations February 2021
Environmental Engineering-I
(Civil Engineering)

Max. Marks: 70   Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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			Marks	CO	Blooms Level
		UNIT–I			
1.	a)	Explain the need for protected water supply?	7M	1	2
	b)	Discuss the sources of water in terms of quality and quantity?	7M	1	2
		OR			
2.	a)	Summarize the factors affecting water demand?	7M	1	2
	b)	Explain any two methods used for population forecast with illustration.	7M	1	2
		UNIT–II			
3.	a)	Draw and explain the features of a reservoir intake?	7M	2	2
	b)	Discuss the different systems of water distribution.	7M	2	2
		OR			
4.	a)	Discuss the waterborne diseases.	7M	2	2
	b)	List the WHO potable water quality standards.	7M	2	1
		UNIT–III			
5.	a)	Draw and explain various units operations of water treatment.	7M	3	1
	b)	Design a clarifier to treat 1MLD with a SOR of 30000 l/m^2/day.	7M	3	6
		OR			
6.	a)	Explain the theory of filtration? Design a slow sand filter for a population of 25,000 with 140 lpcd. Assume the rate of filtration as 24000 l/m^2/day.	7M	3	2
	b)	Discuss briefly i) Break point chlorination ii) Disinfection methods	7M	3	2
		UNIT–IV			
7.	a)	Discuss different systems of sewerage with their merits and demerits.	7M	4	2
	b)	Define DWF? Explain the factor affecting dry weather flow?	7M	4	2
		OR			
8.	a)	Discuss the factors affecting the quantity of sewage?	7M	4	2
	b)	Calculate the runoff coefficient for a catchment with 200 ha. which comprises of 10% surfaces with runoff coefficient 0.90, 25% surfaces with a runoff coefficient of 0.65, 45% area with a runoff coefficient of 0.30 and rest with a runoff coefficient of 0.10. If the rain fall intensity is 45mm/hr., calculate the design discharge.	7M	4	3
		UNIT–V			
9.	a)	Discuss the method of estimation for sewage solids?	7M	5	2
	b)	Explain the terms and mention the importance them i)DO ii)BOD iii)COD	7M	5	2
		OR			
10.	a)	Explain the working of trickling filter with a sketch.	7M	5	2
	b)	Discuss the operational features of Septic tank with a neat sketch?	7M	5	2

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III B.Tech. I Semester Supplementary Examinations February 2021
Managerial Economics and Financial Analysis
(Common to CE, ME & ECE)

Max. Marks: 70   Time: 3 Hours
Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)
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Marks	CO	Blooms Level

UNIT–I

1. Define Managerial Economics and Discuss its nature and scope.

OR

2. Explain any two principles of Managerial Economics.
   (a) Opportunity Cost Principle
   (b) Risk and Uncertainty Principle
   (c) Equi-Marginal Principle

UNIT–II

3. Discuss the Cost-Output Relationship in short run and long run.

OR

4. Explain the following demand forecasting methods
   (a) Consumers survey method
   (b) Regression Method

UNIT–III

5. Discuss the problems and remedies of Public Sector Business Organisations.

OR

6. Explain the following pricing methods
   (a) Market Skimming Pricing
   (b) Peak Load Pricing

UNIT–IV

7. Discuss double entry book keeping and state the procedure for preparing balance sheet of the firm at the end of financial year.

OR

8. A company is considering two mutually exclusive projects. Both require an initial investment of ₹ 10,000 each and have a life of five years. The cost of capital of the company is 10%. The estimated cash inflow of the two projects are as follows :

Year	1	2	3	4	5
Project A	4000	4000	4000	4000	4000
Project B	5000	6000	5400	4000	5000

You are required to calculate Net Present Value and suggest which project should be accepted. The PV factors at 10% from first year to fifth year are 0.909, 0.826, 0.751, 0.683 and 0.621 respectively.

UNIT–V

9. Explain the meaning of financial ratio and discuss its significance in analysing the financial performance of a firm.

OR

10. From the following information, you are required to prepare a Balance Sheet.
    (i) Current Ratio – 1.75
    (ii) Liquid Ratio – 1.25
    (iii) Stock Turnover Ratio (Cost of sales/closing stock) – 9
    (iv) Gross Profit Ratio – 25 per cent
    (v) Debt collection period – 1.5 months
    (vi) Reserves and surplus to capital – 0.2
    (vii) Turnover to fixed assets – 1.2
    (viii) Capital gearing ratio – 0.6
    (ix) Fixed Assets to net worth – 1.25
    (x) Sales for the year ₹ 12,00,000

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Code: 5G653

III B.Tech. I Semester Supplementary Examinations February 2021
Water Resource Engineering-I
(Civil Engineering)

Max. Marks: 70   Time: 3 Hours
Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)
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		Marks	CO	Blooms Level

UNIT–I

1. a) Describe the hydrologic cycle with a neat sketch. — 7M CO1 L01

   b) A basin has the area in the form of a pentagon with each side of length 20 km as shown in the figure. The five rain gauges located at the corners A, B, C, D and E have recorded 60,81,73,59 and 45 mm of rainfall respectively. Compute the average depth of rainfall over the basin by arithmetic mean and Thiessen polygon methods.
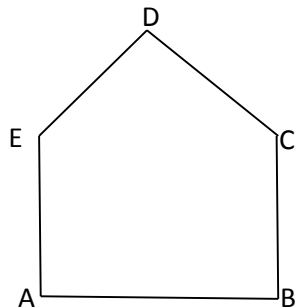
   7M CO1 L01

OR

2. a) Describe the principle of working of a float type recording rain gauge with a neat sketch. — 7M CO2 L02

   b) Explain the terms: (i) Rainfall mass curve and (ii) Rainfall hyetograph. — 7M CO2 L02

UNIT–II

3. a) List the various methods of estimating evaporation from water bodies. Explain any one method in detail. — 7M CO2 L02

   b) Explain the terms 'infiltration' and 'infiltration capacity rate'. What are the factors affecting infiltration? — 7M CO2 L02

OR

4. a) Discuss the various climatic factors affecting runoff. — 7M CO2 L02

   b) Why is base flow separated from total runoff? Describe any two methods of separating base flow from the total runoff. — 7M CO2 L02

UNIT–III

5. a) What is a unit hydrograph? Explain the assumptions involved in the unit hydrograph theory. — 7M CO3 L03

   b) Given below are the ordinates of a 6-h unit hydrograph (UH) for a catchment. Two storms each of 6-h duration and having rainfall excess values of 3.0 cm and 2.0 cm respectively occur successively on the catchment. The 2 cm rain follows the 3 cm rain. Calculate the resulting Direct Runoff Hydrograph.

Time(h)	0	3	6	9	12	15	18	24	30	36	42	48	54	60	69
UH Ordinate (m^3/s)	0	25	50	85	125	160	185	160	110	60	36	25	16	8	0

   7M CO3 L03

OR

6. a) What is a S-curve hydrograph? How is it constructed? What are its uses?   7M   CO4   L04

   b) What do you understand by synthetic unit hydrograph? Explain how it is derived.   7M   CO4   L04

UNIT–IV

7. a) Derive an expression for the steady state discharge of a well fully penetrating into a confined aquifer.   7M   CO5   L05

   b) An unconfined aquifer has a thickness of 30m. A fully penetrating 20cm diameter well in this aquifer is pumped at a rate of 35 lit/s. The drawdown measured in two observation wells located at distances of 10m and 100m from the well are 7.5m and 0.5m respectively. Determine the average hydraulic conductivity of the aquifer. At what distance from the well the drawdown is insignificant?   7M   CO5   L05

OR

8. a) What is balancing depth in a canal? Derive an expression for the same.   7M   CO5   L05

   b) Compare Kennedy's and Lacey's theories for the design of irrigation channel in alluvial soil.   7M   CO5   L05

UNIT–V

9. a) Discuss the benefits as well as the ill-effects of irrigation.   7M   CO5   L05

   b) Describe the border strip method of irrigation with a neat sketch.   7M   CO5   L05

OR

10. a) Explain the terms 'duty' and 'delta'. How can duty be improved?   7M   CO5   L05

   b) A water course has a culturable commanded area of 1200 hectares. The intensity of irrigation for crop A is 40% and for B is 35%, both the crops being Rabi crops. Crop A has a kor period of 20 days and crop B has kor period of 15 days. Calculate the discharge of the water course if the kor depth for crop A is 10cm and for B it is 16cm.   7M   CO5   L05

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