III B.Tech. I Semester Supplementary Examinations May 2019

Engineering Hydrology-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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UNIT–I

1. Explain with the help of a diagram the hydrologic cycle   14M

OR

2. a) Explain different forms of precipitation & write types of precipitations   7M

    b) Explain anyone type of automatic rain gauge   7M

UNIT–II

3. a) What are the factors affecting evaporation.   7M

    b) Explain different methods used to calculate evaporation in a catchment area.   7M

OR

4. What is runoff? What are the factors that affect the runoff from a catchment area   14M

UNIT–III

5. a) Explain the method of determining direct runoff from a given storm hydrograph.   7M

    b) Explain the procedure of SCS method   7M

OR

6. Write a short notes on

    (a) S-Hydrograph   (b) IUH   14M

UNIT–IV

7. State and discuss assumptions and limitations of Dupuits theory   14M

OR

8. Using Lacey's theory, design an irrigation channel for the following data.

    Discharge ϕ=50m³/sec, Silt factor = 1, Side slopes = ½: 1   14M

UNIT–V

9. a) Write an essay on history om irrigation developments in India   7M

    b) Write a note on sprinklers method of irrigation.   7M

OR

10. a) Discuss in brief the functions of irrigation water. What are the standards of irrigation water?   7M

    b) Discuss various methods of assessment irrigation water   7M

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Code: 4G652

R-14

III B.Tech. I Semester Supplementary Examinations May 2019
Engineering Geology
(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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UNIT–I

1. Knowledge of engineering geology is essential to become a successful civil engineer. Justify the statement?   14M

OR

2. How does weathering operates on rocks? What is the significance of weathering in Civil Engineering?   14M

UNIT–II

3. a) Explain different methods of study of minerals? What are the advantages of study of minerals by physical properties?   4M

    b) Distinguish between rock forming minerals and economic minerals? Explain any four physical properties of minerals studied for their identification?   10M

OR

4. a) List various physical properties of minerals studied for their identification   2M

    b) Describe the physical properties of following rock forming minerals
        I)   Talc
        II) Calcite   12M

UNIT–III

5. Distinguish between texture and structure of rocks? Explain the structures exhibited by sedimentary rocks?   14M

OR

6. a) List the major types of rocks? Explain the physical and engineering properties of granite rock?   10M

    b) What do you understand about stress and strain in rocks?   4M

UNIT–IV

7. a) Explain in brief about exploration of groundwater?   10M

    b) What do you understand about cone of depression?   4M

OR

8. a) Explain the measures to be taken to prevent the occurrence of landslides?   10M

    b) What do you understand about seismic waves?   4M

UNIT–V

9. a) List types of dams?   2M

    b) Give a brief about geological considerations in tunneling with respect to lithological, structural and hydro geological factors?   12M

OR

10. a) List the factors contributing success of a reservoir?   8M

    b) Explain various types of dams with sketches and suitable foundations for these dams?   6M

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Code: 4GA51

III B.Tech. I Semester Supplementary Examinations May 2019
Managerial Economics and Financial Analysis
(Common to CE, ME and 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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UNIT–I

1.   What do you understand by elasticity of demand? How do you measure its. What is its significance?

OR

2.   Write elasticity demand and factors governing elasticity of demand.

UNIT–II

3.   State the break even analysis? Explain objectives, importances and show the graphical representation of BEP.

OR

4.   Rainbow enterprises deals in the supply of computers the following cost data available for two successive periods

	Year 1 Rs	Year 2 Rs
sales	50000	120000
Fixed costs	10000	20000
Variable cost	30000	60000

determine

   a) p/v ratio   4 marks
   b) breakeven point   5 marks
   c) margin of safety   5 marks

UNIT–III

5.   Elaborate monopoly market and price out-put determination in short run and long run.

OR

6. a) What are the causes for the emergence of monopoly?

    b) How is the equilibrium position attained by monopoly list under varying cost conditions?

UNIT–IV

7.   What is working capital? Explain the factors governing working capital requirements?

OR

8.   A business firm is thinking of choosing the right machines for their purpose after financial evolution of the proposals the initial cost and the net cash flow over five years to the business firm have been calculated for each machine as follows.

	Machine 1 (Rs)	Machine 2 (RS)
Initial cost	20000	28000
annual cash inflow 1year	8000	10000
2 year	12000	12000
3 year	9000	12000
4 year	7000	9000
5 year	6000	9000

Choose the machine based on i) payback period ii) accounting rate return

UNIT–V

9. From the following trial balance of xyz ltd prepare trading and profit&loss account for the year ending 31-3-2017 and balance sheet as on date considering the adjustments given below:

Debit balances	Rs	Credit balances	Rs
buildings	70000	Carriage in wards	1291
Motor trucks	12000	Reserve doubtful debts	1320
furniture	1640	Establishments expenses	2135
debtors	15600	Carriage out wards	800
creditors	18852	insurance	783
stock	15040	interest	340
Cash in hand	988	bad debts	613
Cash at bank	14534	Audit fee	400
Bills receivables	5844	General expenses	3050
purchases	85522	investments	8922
discount	945	sales	121850
Returns in word	285	capital	920000
		Bills payable	6930
		rent	900
Adjustments: 1) closing stock Rs 15000 2) depreciation on motor trucks 20% and furniture 10% per annum 3)write of bad debts of Rs100 and maintain at 5% reserve for doubtful debts 4) prepaid insurances Rs 150 5)interest accrued but not received Rs 120			

OR

10. Write Short notes on
   a) Liquidity ratios   3M
   b) Profitability ratios   4M
   c) Activity ratios   4M
   d) Capital structure ratios are illustrating suitable example. 3M

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Code: 4G651

R-14

III B.Tech. I Semester Supplementary Examinations May 2019
Structural Analysis-II
(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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UNIT–I

1. a) Determine the horizontal thrust developed in a two hinged semicircular arch of radius R subjected to a concentrated load W at the crown , Assume flexural rigidity as constant

    b) A two-hinged circular arch has a span of 42 mtrs and a rise of 6 mtrs. It is loaded with a point load of 42kN at Crown. Determine the horizontal thrust developed. Also calculate radial shear and normal thrust at a section 10 m from the left hand support.

OR

2. a) Show that the parabolic shape is a funicular shape for a three-hinged arch subjected to UDL over to its entire span.

    b) A symmetric Three-hinged parabolic arch of span 32mtrs and rise 6mts is subjected to a concentrated load of 120kN at a point 12 m from the left support. Draw the BMD for the arch.

UNIT–II

3. A portal frame ABCD is hinged at A and fixed at D and has stiff joints at B and C. the loading is as shown in figure. Draw the bending moment diagram for the frame.
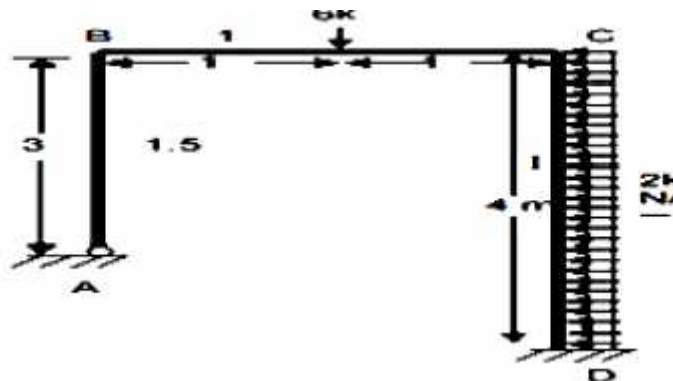
OR

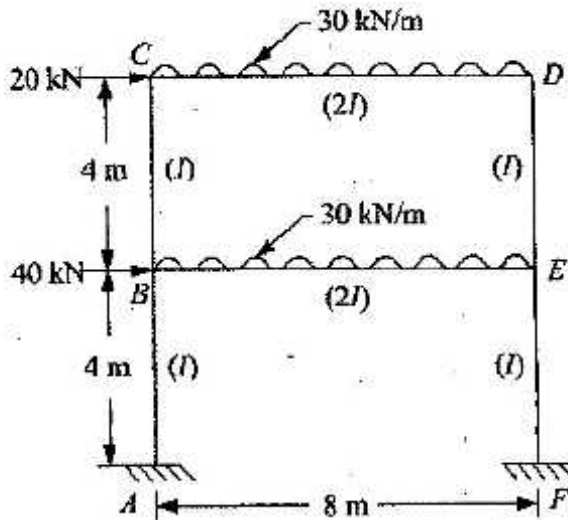4. a) Analyze the frame shown in figure by moment distribution method. Draw BMD
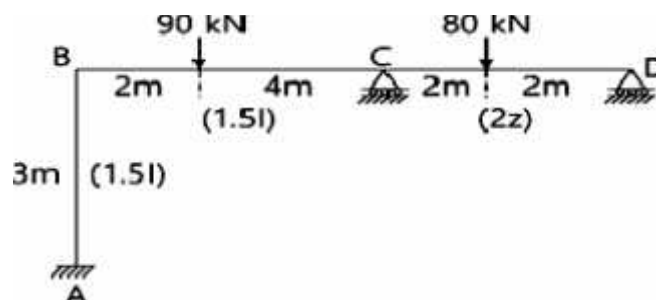
    b) A fixed beam of span 6m carries a uniformly distributed load of 18kN/m. If the right support sinks by 6.5mm, find the fixing moment of the supports. Draw S.F.D and B.M.D. Take $E = 200kN/mm^2$ and $I = 5 \times 10^7 mm^4$. Analyze by moment distribution method
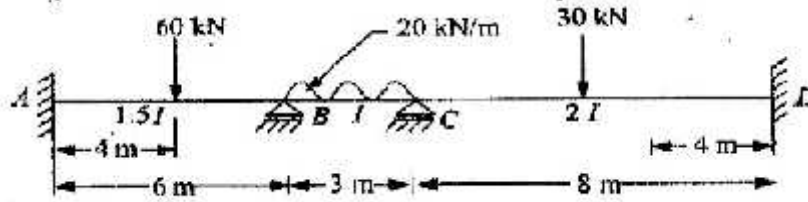
5. a) Write the steps for analyzing a portal frame carrying a udl by Kani's method.

   b) Draw S.F.D and B.M.D of the fixed beam of span 'l',carrying u.d.l for a distance of 'a' from one end. Use Kani's method.

OR

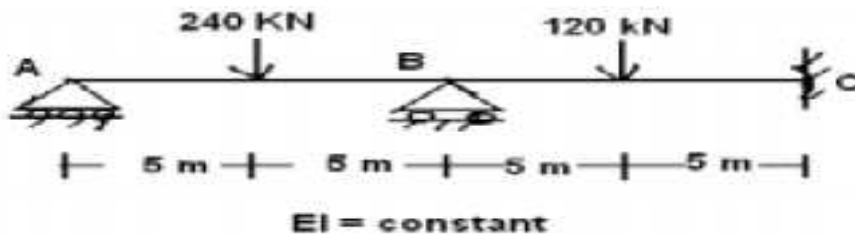6. a) Using the Kani's method analyse the frame shown in fig.

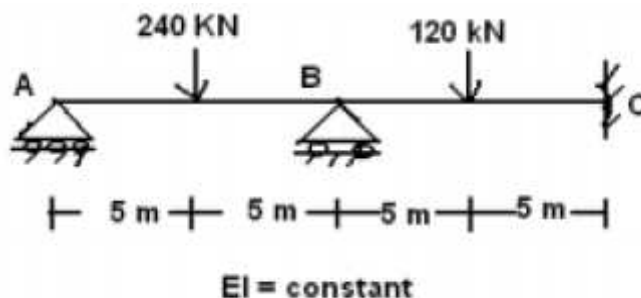   b) Analyze the continuous beam shown below by Kani's method

UNIT–IV

7. a) Generate the flexibility matrix of beam ABC as shown in figure, below by flexibility matrix method and sketch the bending moment diagram


   b) Analyze the continuous beam ABC shown in Fig below by flexibility matrix method and draw the bending moment diagram. M_A and M_B are redundant

OR

8. a) A portal frame ABCD with supports A and D are fixed at same level carries a uniformly distributed load of 80kN/m on the span AB. Span AB=BC=CD=9m. EI is constant throughout. Analyze the frame by stiffness matrix method.

    b) Analyze the continuous beam shown in figure using stiffness matrix method
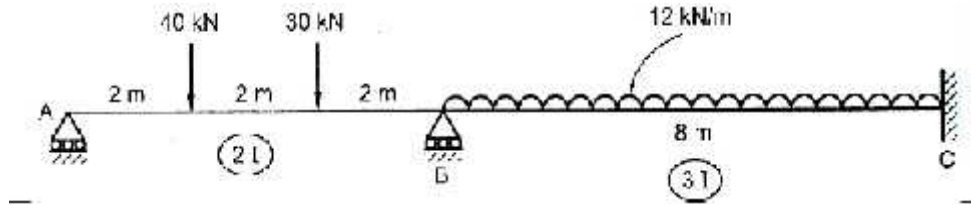
UNIT–V

9. a) Write the shape factors for the following sections.

    i) Rectangular section, ii) Triangular section, iii) Circular section, iv) Diamond section

    b) A Simply supported beam of span 5m is to be designed for a UDL of 25 kN/m. Design a suitable I section using plastic theory, Assuming yield stress in steel as $F_y = 250$ N/mm^2

OR

10. a) A fixed beam of span ' *l* ' carries a uniformly distributed load „w" on the right half portion. Find the value of collapse load Wc. The beam is of uniform moment of resistance.

    b) Calculate the shape factor of the I-section with top flange 100 mm wide, bottom flange 150 mm wide, 20 mm thick and web depth 150 mm and web thickness 20 mm.

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Code: 4G655

III B.Tech. I Semester Supplementary Examinations May 2019
Design & Drawing of Reinforced Concrete Structures
(Civil Engineering)

Max. Marks: 70

Time: 3 Hours

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PART-A
Answer *any One* questions (1 x 28 = 28 Marks)

1. Design a square slab 5m x 5m simply supported on all four edges carrying a live load of 6000 N/m^2, Assume load factors of 1.5 and 2.2 for dead load and live load respectively, f_y = 250 N/mm^2, f_{ck} = 20N/mm^2, self weight of concrete is 25000 N/m^3. Adopt Limit state method of design. Draw to a suitable scale
   (a) Longitudinal section showing the reinforcement details.
   (a) Cross section of the slab showing reinforcement details   28M

2. An isolated T beam, having a span of 6m and cross sectional dimensions as follows. Width of flange = 1000 mm, thickness of flange = 100 mm, overall depth of section = 600 mm and width of web = 250 mm. The beam is subjected to a service load moment of 200 kNm. Compute the maximum stresses in concrete and steel, assuming M 15 and Fe415 steel. Draw to a suitable scale
   (a) Longitudinal section showing the reinforcement details.
   (b) Cross section of the beam showing reinforcement details.   28M

PART-B
Answer *any Three* questions (3 x 14 = 42 Marks)

3. a) Discuss the merits and demerits of Working stress method and Limit state method.   7M
   b) Differentiate between doubly reinforced beam and over reinforced beam.   7M

4. Discuss the behaviour of reinforced concrete members in shear.   14M

5. Design a one way slab, with a clear span of 4.0m, simply supported on 230 mm thick masonry walls, and subjected to a live load of 4 kN/m^2 and a surface finish of 1 kN/m$^{2.}$ Assume M15 concrete and Fe 415 steel.   14M

6. Design an isolated footing for a square column, 450 mm x 450 mm, reinforced with 8 numbers of 25 mm dia bars, and carrying a service load of 2300 kN, Assume soil with a safe bearing capacity of 300 kN / m^2 at a depth of 1.5 m below ground. Assume M20 grade concrete and Fe 415 grade steel for the footing, and M25 concrete and Fe415 steel for the column.   14M

7. Discuss the important serviceability limit states in Reinforced concrete flexural members.   14M

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III B.Tech. I Semester Supplementary Examinations May 2019
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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UNIT–I

1. a) What is the necessity of water supply schemes in the present day community?   7M
   b) What are the common sources of water available in the nature used for the water supply?   7M

OR

2. a) Mention and discuss the factors that influence per capita demand.   4M
   b) The population statistics pertaining to a town are given below. Estimate the population expected in 2020 by arithmetical and geometrical increase methods.

Year	1970	1980	1990	2000	2010
Population	85000	115000	165000	215000	255000
   10M

UNIT–II

3. a) Describe, with the help of sketches, a reservoir intake for an earthen dam.   7M
   b) Write a note on distribution reservoirs. Where are these located?   7M

OR

4. a) Illustrate with sketches any two types of layouts of pipe systems in distributing water, and compare their merits and demerits.   7M
   b) Describe in brief various important tests conducted for physical examination of water.   7M

UNIT–III

5. a) Briefly explain the different treatment processes that are used for water supply.   7M
   b) Design a coagulation sedimentation tank to treat 10 million liters of water per day. Assume suitable data where necessary.   7M

OR

6. a) What do you understand by break point chlorination? What are its advantages?   7M
   b) A coagulation-sedimentation plant clarifies 50 MLD. The quantity of filter alum required at the plant is 20 mg/l. If the raw water is having an alkalinity equivalent to 4mg/lit of $CaCO_3$, determine the quantity of filter and the quick lime (containing 85% of CaO) required per year by the plant. Given the molecular weights as: (Al=27, S=32, O=16, H=1, Ca=40, C=12)   7M

UNIT–IV

7. a) Write a short note on sewer sections. Illustrate your answer with the help of neat sketches.   7M
   b) Design a sanitary sewer with the following data. Population served=25000; expected sewage flows=135 LPCD; average slope of ground=1 in 500.   7M

OR

8. a) Write short notes on the maintenance of sewers. How the sewers are cleaned?   7M
   b) Write a note on national river cleaning plants.   7M

UNIT–V

9. a) What are the characteristics of sewage? How various constituents of sewage influence these characteristics?   7M
   b) If 2.5 ml of raw sewage have been diluted to 250 ml and D.O. concentration of the diluted sample at the beginning was 8 mg/lit and 50 mg/lit after 5 days incubation at 20^0C. Find the BOD of raw sewage.   7M

OR

10. a) What do you understand by screening and skimming? What are the various types of screens? Describe.   7M
    b) Design a rectangular grit-chamber from the following data: Flow of sewage= 55×10^6 lit/day; specific gravity of grit=2.7; size of the grit particle to be removed=0.21mm; velocity of the water=1.0×10^{-2} cm^2/sec   7M

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