Hall Ticket Number :										

R-15

Code: 5G655

III B.Tech. I Semester Supplementary Examinations May 2018

Design and Drawing of Reinforced Concrete Structures

(Civil Engineering)

Max. Marks: 70 Time: 3 Hours

PART-A

Answer any one question (1 x 28 = 28 Marks)

1. Design a T-Beam section with a flange width of 1250mm, flange depth of 100mm, a web width of 250mm and an effective depth of 500mm, which is subjected to a factored moment of 560kNm. The concrete mix to be used is of M20 and steel is of grade Fe415
   a. Draw the reinforcement details in cross section
   b. Draw the reinforcement details in longitudinal direction

OR

2. Design a interior panel two way R.C. Slab for a room 4m wide and 4m long. The slab is supported on R.C.C Beams. The width of beam is kept as 230 mm. The superimposed load is 3.2 kN/m^2 and finishing load expected is 1.8 kN/m^2
   Use M 20 concrete and Fe 415 steel.
   (a) Draw the reinforcement of the slab in plan view.
   (b) Draw cross section of the slab including beams with reinforcement details.

PART-B

Answer any Three questions (3 x 14 = 42 Marks)

3. A rectangular simply supported beam 300mm wide and 400 mm deep upto the center of reinforcement, has to resist a load of 20kN/m and having effective span of 6m. Design the section. Use M20 grade concrete and Fe 415 steel.

4. Design a simply supported RC beam for shear subjecting load a UDL of 30kn/m and having span of 4m. width of the beam is 230mm and depth of the beam is 450mm.

5. Design a simply supported one way slab with dimensions 3x7m. Width of the supports on four edges are 230mm. Live load on the slab is 4kn/m2 and dead load including self-weight is 3.5kN/m^2. Use M20 grade concrete and Fe415 steel.

6. Design a column of size 300x450mm subject to a axial load of 800kN moments are Mx = 50knM and My = 60kNm at top and bottom of the column. Effective length of the column is 3m.

7. Explain in detail about limit state of serviceability with codal provisions.

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Hall Ticket Number :										

R-15

Code: 5G654

III B.Tech. I Semester Supplementary Examinations May 2018

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) Explain the objectives of water supply system 6M

   b) What are the various surface sources of water? Explain their suitability in terms of quantity and quality. 8M

OR

2. a) Explain the various types of water demand 6M

   b) Forecast the population in the year 2036, for a town, whose census data is given below, by using Geometric increase method and Incremental increase method.

Census Year	1951	1961	1971	1981	1991	2001	2011
Population (in thousands)	130	235	285	340	455	550	675

8M

UNIT–II

3. a) Describe with a neat sketch about i) Canal Intake ii) River Intake 8M

   b) Explain the system of water distribution 6M

OR

4. a) Explain the significance of the following water quality parameters
   i) Turbidity ii) Hardness iii) Nitrate iv) Bacteria 8M

   b) List out the standards of water quality parameters as per WHO 6M

UNIT–III

5. a) Explain the layout and general out lines of water treatment units. 7M

   b) Explain the determination of optimum dose of coagulants. 7M

OR

6. a) Determine the dimensions of a set of rapid sand filters for treating water required for a population of 20,000 with an average rate of demand 150 liters per head per day. 7M

   b) What is meant by sterilization of water? Describe briefly any three methods of disinfections. 7M

UNIT–IV

7. a) What do you understand by the following terms
   i) sewage ii) sullage iii) sewer and iv) sewerage 6M

   b) Explain the operation and maintenance of sewers 8M

OR

8. a) Determine the size of a circular sewer for a discharge of 800 lps running half-full. Assume hydraulic gradient of 1 in 1200 and Manning's constant n=0.013 6M

   b) With a neat sketch, explain about 'manhole and storm water regulators' 8M

UNIT–V

9. a) What is BOD? Explain the significance BOD/COD ratio. 7M

   b) Explain the layout and general outline of domestic wastewater treatment plant 7M

OR

10. a) Design a standard rate trickling filter to treat 8 MLD of sewage with inlet BOD of 300 mg/lit and outlet BOD of 75 mg/lit. 7M

    b) With neat sketch, explain about septic tank 7M

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Hall Ticket Number :										

R-15

Code: 5G652

III B.Tech. I Semester Supplementary Examinations May 2018

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. a) What do you understand about weathering? Highlight on significance of weathering in civil engineering? 12M

   b) Give a brief about significance of geology in water resources development? 2M

OR

2. a) What do you understand about petrology and structural geology? Elaborate on how knowledge of these subjects is essential to a civil engineer? 8M

   b) Give a brief about significance of geology in planning, designing and execution of major civil engineering projects 6M

UNIT–II

3. a) Distinguish between a mineral and rock? 2M

   b) Give a brief about the physical properties of minerals to be studied for identification of minerals? 12M

OR

4. Highlight on various methods available for identification of minerals? List down various physical properties of minerals to be studies for identification of minerals? Present the physical properties of quartz mineral? 14M

UNIT–III

5. a) Distinguish between dip and strike of rocks with appropriate sketches? 4M

   b) High light on structures of sedimentary rocks 10M

OR

6. a) List down various types of rocks and elaborate on how these rock types are formed? 10M

   b) What is the importance of folds in civil engineering? 4M

UNIT–IV

7. a) What do you understand about hydrological properties of rocks? 10M

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

OR

8. a) Give a brief about permeability and specific yield of rocks with respect to groundwater? 2M

   b) Give a brief about causes of occurrence of earthquakes? 12M

UNIT–V

9. a) Highlight on geological consideration in selection of suitable dam site? 12M

   b) What is over break in tunneling of rocks? 2M

OR

10. a) Highlight on geological considerations in tunneling? 12M

    b) Highlight on types foundations required for gravity dams and arch dams? 2M

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Hall Ticket Number :										

Code: 5GA51

R-15

III B.Tech. I Semester Supplementary Examinations May 2018

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)

*****

UNIT-I

1. Define Price elasticity, Income elasticity and Cross price elasticity of demand. What are the different methods of measuring Price Elasticity of demand? Derive relationship between Price Elasticity of Demand and Marginal Revenue?

OR

2. Define Managerial Economics. Discuss the nature and scope of Managerial Economics. What is the relationship of Managerial Economics with Microeconomics?

UNIT-II

3. What is the shape of long-run average cost curve and explain why? Differentiate between Economies of Scale and Economies of Scope with suitable examples.

OR

4. Define and show graphically the Break even point of a firm. Find out the break even output (Q*) of a firm if total cost (TC) = Rs. 6310; total revenue (TR) = Rs. 4130; fixed cost (FC) = Rs. 4980; variable cost (VC) = Rs. 1330 and present output (Q) = 5.

UNIT-III

5. Compare and Contrast the Short-run and Long-run equilibrium conditions under Perfect competition and Monopoly market.

OR

6. Define Oligopoly market structure. Describe how price and output is determined under Stackelberg Duopoly model.

UNIT-IV

7. Why is capital important for a firm? What are the various sources of raising capital? Elaborate.

OR

8. What is capital budgeting? Define Net Present Value and Discount Rate. Write a brief note on Pay Back Method.

UNIT-V

9. What do you understand by the term ‘Ledger’ and ‘Trial Balance’? Name two methods of preparing a Trial Balance. Prepare a purchase book from the following information:
   a) Purchase of goods costing Rs. 5000/- from M/s Ramesh & Co. vide invoice no. 120 dated 15/09/2017.
   b) Purchase of Fixed Assets costing Rs. 8000/- from M/s Renu & Co. vide invoice no. 016 dated 20/09/2017.
   c) Paid wages of Rs. 600/- in cash vide receipt no.16 dated 25/09/2017.

OR

10. What is the meaning of Accounting Ratios? What are the objectives of ratio analysis? List out the advantages and limitations of ratio analysis.

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Hall Ticket Number :										

R-15

Code: 5G651

III B.Tech. I Semester Supplementary Examinations May 2018

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

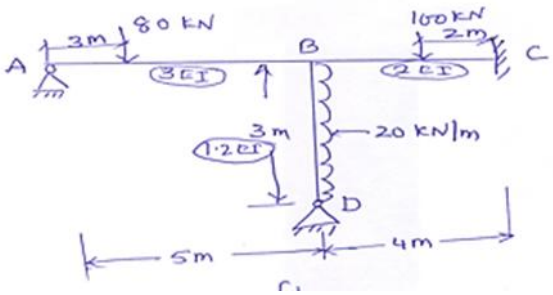
1. A symmetrical three hinged parabolic arch has a span of 20m it carries UDL of 10kN/m over a entire span and two point loads of 40kN each at 2m and 5m from left hand support calculate reactions, bending moment, normal thrust, radial shear at a section 4m and 15m from left support take rise of 4m

OR

2. A two hinged parabolic arch of 30m span and rise of 5m. it carries a udl of 45 KN/m over entire span and concentrated load of 50 KN at 10m from left end. Find the location and magnitude of maximum bending moment. Also find the normal thrust at the same point.

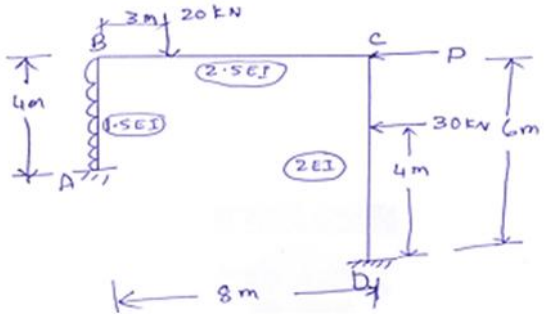
UNIT–II

3. Analyze the frame shown in fig. below by slope deflection method. EI=constant



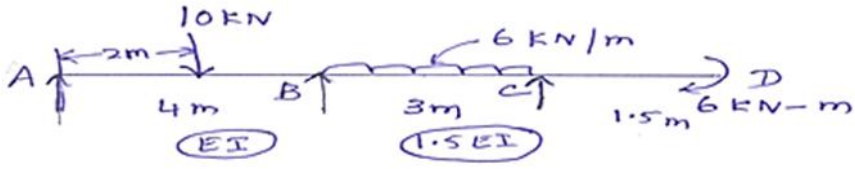
OR

4. Find the value of P shown in fig. below to prevent the sway for the given frame by moment distribution method. EI=constant



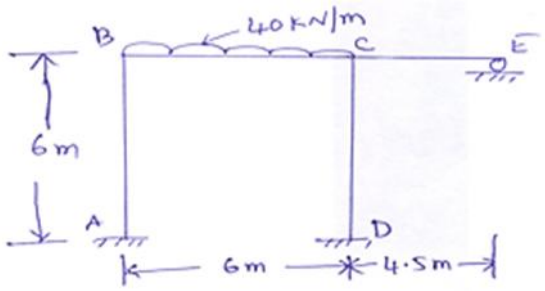
UNIT–III

5. Analyze the continuous beam shown in fig. below by Kani's method. EI=constant.



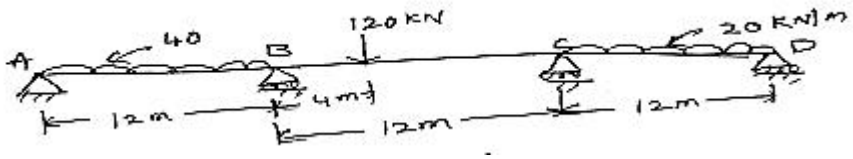
OR

\6. Analyze the following frame shown in fig. below by Kani's method. Take EI as constant.



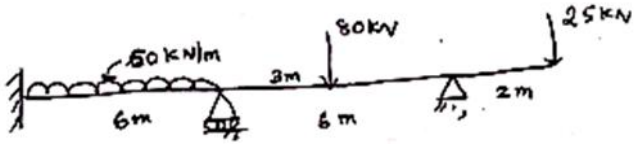
UNIT–IV

7. Analyze the continuous beam shown in fig. below by Flexibility method Take EI as constant.



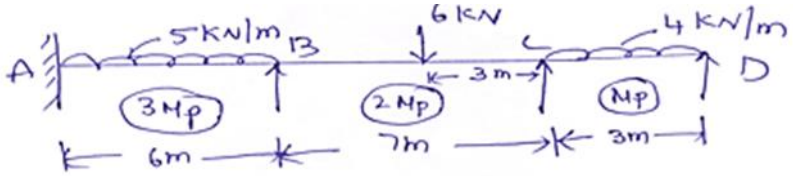
OR

8. Analyze the continuous beam shown in fig. below by stiffness method Take EI as constant.



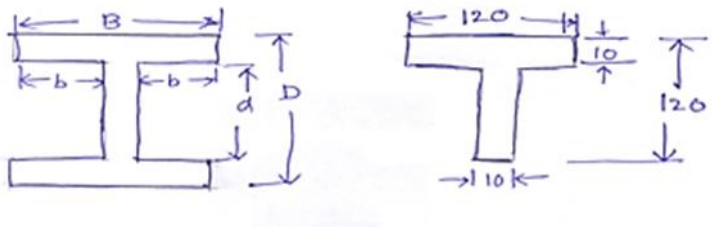
UNIT–V

9. Find plastic moment of given continuous beam shown in fig-below using load factor as 1.5.



OR

10. Determine the shape factor for a symmetrical I-section and T-section shown in fig-below



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Hall Ticket Number :										

R-15

Code: 5G653

III B.Tech. I Semester Supplementary Examinations May 2018

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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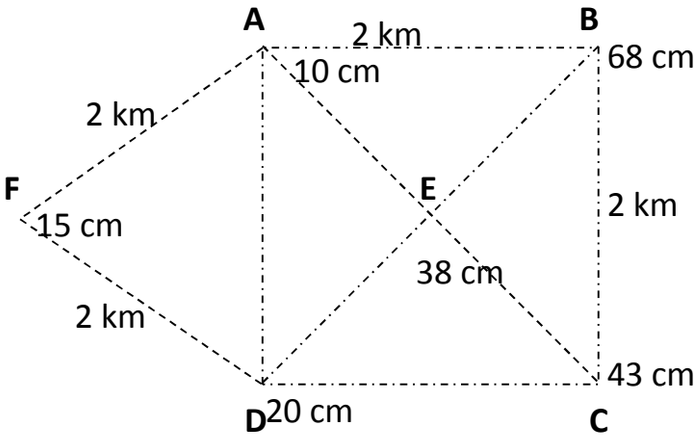
UNIT–I

1. a) Differentiate between 'rain hyetograph' and 'mass curve' of a rainfall with neat sketch. 4M

   b) The area shown in Fig. 1 is composed of a square plus an equilateral plot of side 2 km. The annual precipitation at the rain gauges station located at four corner and centre of the square and apex of the triangle are indicated in the figure. Find the mean precipitation over area by Thiessen polygon method and compare with arithmetic mean.



10M

OR

2. a) Explain Dalton's law of evaporation. What are different factors affecting process of evaporation? 4M

   b) Calculate the potential evaporation using Penman's method from the location with the following available meteorological data:

Latitude 28 º 4' N	Altitude 230 m (above sea level)
Mean monthly temp 20 ºC (Nov)	Relative humidity 75 %
Mean observed sunshine hrs = 9 hrs	Wind velocity at 2 m above ground = 85 km/day
Surface cover: plant cover ground	

*Useful data and Formula is attached at the end of paper. 10M

UNIT–II

3. a) With neat sketch explain the working of double ring infiltrometer. 7M

   b) A 3 hr storm over a basin of 1830 Km^2 produced the rainfall intensities at half an hour interval are 1.6, 3.6, 5.0, 2.8, 2.2, 1.0 cm/hr. If the corresponding observed runoff is 65.88 x 10^6 m^3, determine the Φ index. 7M

OR

4. The mean annual flood of a river is 600 m^3/s and the standard deviation of the annual series is 150 m^3/s. What is probability of a flood of magnitude 100m^3/s occurring in the river within next 5 years? Use Gumbel's method and assume sample size to be very large. 14M

UNIT–III

5. a) What is a Unit hydrograph? List the assumption involved in the unit hydrograph theory. 4M

   b) Rainfall of magnitude 3.8 cm and 2.8 cm occurring on two consecutive 4-h durations on a catchment of area 27 km^2 produced the following hydrograph of flow at the outlet of the catchment. Estimate the rainfall excess and Φ- index.

Time of start of rainfall (h)	-6	0	6	12	18	24	30	36	42	48	54	60	66
Observed flow (m^3/s)	6	5	13	26	21	16	12	9	7	5	5	4.5	4.5

10M

OR

6. a) Why base flow is separated from the flood hydrograph in the process of developing a unit hydrograph? 7M

   b) Explain the procedure of deriving a D-hr unit hydrograph from the IUH of the catchment. 7M

UNIT–IV

7. a) Explain the Recuperation test. 6M

   b) A 20-cm diameter tube well taps an artesian aquifer. Find the yield for a drawdown of 3.0 m at the well. The length of the strainer is 30 m and the coefficient of permeability of the aquifer is 35 m/day. Assume the radius of influence as 300 m.

   If all other conditions remain same, find the percentage change in yield under the following cases:

   (i) The diameter of the well is 40 cm;
   (ii) the drawdown is 6.0 m;
   (iii) the permeability is 17.5 m/day. 8M

OR

8. A stable channel is to be designed for a discharge of 40 m^3/sec. and *f*=1.0.Calculate the dimensions of the channel using Lacey's regime equations. What would be the bed width of this channel if it is designed on the basis of Kennedy's theory? Adopt m=1.0 and *B/D* ratio same as that obtained from Lacey's equation. Take value of Kutter's rugosity coefficient as 0.0225. 14M

UNIT–V

9. a) Explain the term water –logging. Explain the various causes of water logging. 6M

   b) Find out the time required to irrigate the border 150 m long and 10 m wide with a stream of 25 litre/sec. The irrigation is applied at 50% of the soil- water availability. The depth of root zone is 75 cm and bulk density of soil is 1.52 gm/cm^3. Available water holding capacity of the soil is 18%. 8M

OR

10. a) What do you mean by duty and delta of a crop? Derive a relation between the two for a given base period. Find the delta for sugarcane when its duty is 730 hectare/cumec on the field and base period is 110 day. 7M

    b) Determine the volume of water required to be diverted from the head works to irrigate area of 5000 ha using the data given in the table below. Assume 80% as the effective precipitation to rake care of the consumptive use of the crop. Also assume 50% efficiency of water application in the field and 75% as the conveyance efficiency of canal. 7M

Month (1)	*Temp F* (2)	*Percentage hrs of sunshine* (3)	*Rainfall mm* (4)	*Consumptive coefficient or Crop factor (k)* (5)
June	70.8	9.90	75	0.80
July	74.4	10.20	108	0.85
August	72.8	9.60	130	0.85
September	71.6	8.40	115	0.85
October	69.3	7.86	105	0.65
November	55.2	7.25	25	0.65
December	47.1	6.42	0	0.60
January	48.8	8.62	0	0.60
February	53.9	9.95	0	0.65
March	60.0	8.84	0	0.70
April	62.5	8.86	0	0.70
May	67.4	9.84	0	0.75

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Useful data and Formula (for Question 2 (b))

$$PET = \frac{A}{A+¥} H_n + \frac{¥}{A+¥} E_a \qquad A = \frac{4098 e_s}{(237.3+T)^2} \qquad e_s = 4.584 e^{\frac{17.27t}{237.3+t}}$$

$$E_a = 0.35\left(1+\frac{u_2}{160}\right)(e_s - e_a) \qquad H_n = H_a(1-r)\left(a+b\frac{n}{N}\right) - \pm T_a^4 \left(0.56 - 0.092\sqrt{e_a}\right)\left(0.1+0.9\frac{n}{N}\right)$$

a =0.29cosϕ, ϕ is latitude, b= 0.52

σ = 2.1X10^{-9} mm/day , g = psychrometric constant 0.49 mm of mercury/ °C

Table 3.4 *Mean Monthly Solar Radiation at Top of Atmosphere, H_a in mm of Evaporable Water/Day*

North latitude	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0°	14.5	15.0	15.2	14.7	13.9	13.4	13.5	14.2	14.9	15.0	14.6	14.3
10°	12.8	13.9	14.8	15.2	15.0	14.8	14.8	15.0	14.9	14.1	13.1	12.4
20°	10.8	12.3	13.9	15.2	15.7	15.8	15.7	15.3	14.4	12.9	11.2	10.3
30°	8.5	10.5	12.7	14.8	16.0	16.5	16.2	15.3	13.5	11.3	9.1	7.9
40°	6.0	8.3	11.0	13.9	15.9	16.7	16.3	14.8	12.2	9.3	6.7	5.4
50°	3.6	5.9	9.1	12.7	15.4	16.7	16.1	13.9	10.5	7.1	4.3	3.0

surface	*r*
Close ground crops	0.15-0.25
Bare lands	0.05-0.45
Water surface	0.05
snow	0.45-0.95