Hall Ticket Number :										

R-11 / R-13

Code: 1G655

III B.Tech. I Semester Supplementary Examinations Nov/Dec 2017

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 simply supported rectangular beam to carry 38KN/m superimposed load over a span of 5.5 m on 300mm wide supports. Use M20 grade concrete and Fe 415 grade steel. Check the design for all necessary conditions. Draw to a suitable scale

   (a) Longitudinal section showing the reinforcement details.

   (b) The cross section of the beam at salient points, showing reinforcement details.

OR

2. Proportion and design a reinforced concrete isolated footing for a column of size 450x450mm transmitting an axial load of 1200kN and uniaxial bending moment of 450kNm at service state. The soil investigations at the size have indicated that the unit weight, safe bearing capacity and angle of repose of soil are 19kN.m3, 150 kN/m^2 and 30^o, respectively. The construction materials to be used are M20 concrete and HYSD steel of grade Fe415.
   - Draw reinforcement details in plan
   - Draw reinforcement details in section

PART-B

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

3. A rectangular beam 230mm wide and 450 mm deep upto the centre of reinforcement, has to resist a factored moment of 50KN-m. Design the section. Use M20 grade concrete and Fe 415 steel.
4. Design the torsional reinforcement in a rectangular beam section, 300mm wide and 600mm deep and it is subject to an ultimate twisting moment of 150KNm, combined with an ultimate(hogging) bending moment of 250KNm and an ultimate shear force of 150KN. Assume M20 grade concrete and Fe 415 steel and mild exposure conditions.
5. An R.C. Column 400mmx 450mm is subjected to an axial ultimate load of 2200KN and bent in single curvature about the minor axis My (top)= 80KNm and My(bottom)=100KNm as ultimate moments. If Lo=6m and Le=4.50m on both axes, calculate the design moments for the column.
6. A circular column of 400mm diameter transfers an axial dead load of 500KN and an axial live load of 400KN. The column is having 8-20mm diameter bars. The safe bearing capacity of the soil is 250 KN/m^2, Use M20 grade of concrete and HYSD steel bars of Fe415 grade. Design a circular footing to support the circular column.
7. A rectangular simply supported beam of clear span 4.5m is 300mmx600mm in cross Section. It is reinforced with 4 bars of 20mm diameter. Use M20 grade concrete and Fe415 steel. The effective cover is 40mm. Taking super imposed live load as 26 KN/m and dead load as 18KN/m, calculate the short term and long term deflections of the beam.

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Hall Ticket Number :										

R-11 / R-13

Code: 1G653

III B.Tech. I Semester Supplementary Examinations Nov/Dec 2017

Engineering Hydrology– I

(Civil Engineering)

Max. Marks: 70 Time: 3 Hours

Answer any **five** questions

All Questions carry equal marks (**14 Marks each**)

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1. a) With a neat sketch, Explain the various types of Precipitation 7M

   b) Define Rain gauge. Describe with a neat sketch, the principles of working of Symen's non-recording gauge 7M

2. a) What is infiltration? Explain factors affecting infiltration capacity. 7M

   b) What is evaporation? Discuss various methods of estimating evaporation. 7M

3. a) What is runoff? Explain components of runoff. 7M

   b) Explain methods of base flow separation from total runoff. 7M

4. a) What is Hydrograph? What are the different components of hydrograph? 7M

   b) The ordinate of a three hour's unit hydrograph are given below.

Time interval(hr's)	0	3	6	9	12	15	18	21	24	27	30
Ordinate m^3/sec	0	10	25	20	16	12	9	7	5	3	0

   Find the ordinate of a 6hr's unit hydrograph for a basin. 7M

5. a) What is an aquifer? Explain types of aquifer and aquifer parameter. 7M

   b) Write a note on

      i) storage co-efficient.

      ii) Types of well. 7M

6. a) Define Irrigation. Discuss list benefit and ill effects of irrigation. 7M

   b) With a neat sketch explain bhandara type of irrigation. 7M

7. a) Explain the soil moisture and soil moisture contents in different zones. 7M

   b) i) Define Duty and Delta and also explain their relationship.

      ii) A crop requires a total depth of 92cm of water for a base period of 120 days. Find the duty of water. 7M

8. a) What is Canal? Explain various consideration for alignment of canal with sketch. 7M

   b) What is meant by Design of Canal and write a note on comparision between Kenned's and Lacey's theory 7M

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Hall Ticket Number :										

R-11 / R-13

Code: 1G651

III B.Tech. I Semester Supplementary Examinations Nov/Dec 2017

Structural Analysis–II

(Civil Engineering)

Max. Marks: 70 Time: 3 Hours

Answer any **five** questions
All Questions carry equal marks (**14 Marks each**)
Assume relevant data, if required

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1. A three hinged parabolic arch has a span of 60 m and central rise of 8 m. It is subjected to a point load of 40 kN at a distance of 10 m from left support and a u.d.l of 10 kN/m over right half span. Calculate the location and magnitude of maximum bending moment. Also calculate the radial shear, normal thrust and bending moment under 40 kN load. 14M

2. A two hinged parabolic arch carries u.d.l of 30 kN/m over left half span and point load of 120 kN at a distance of 5 m from right span. The span of the arch is 40 m and central rise is 6 m. Determine horizontal thrust, shear force and normal thrust at 10 m from right support 14M

3. A single bay single storey portal frame ABCD is fixed at A and D. The height of the column AB is 4m and that of DC is 6m. The span of the beam BC is 8m. A uniformly distributed load of 70kN/m is acting on the whole span BC. AB=DC=EI and BC=2EI. Calculate the support reactions and also draw the bending moment diagram for the portal frame. Use slope deflection method. 14M

4. Analyse the beam shown in the Fig.1 by moment distribution method. Take $I = 100 \times 10^6$ mm^4.

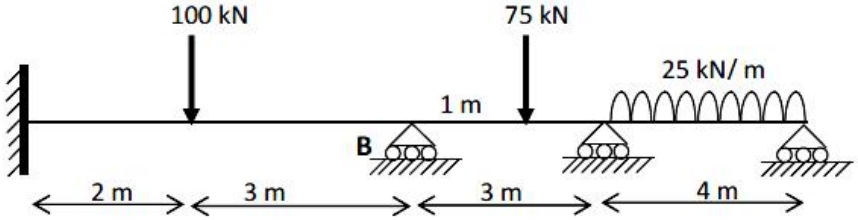

Fig.1 14M

5. Using Kani's method, analyse the portal frame shown in Fig.2

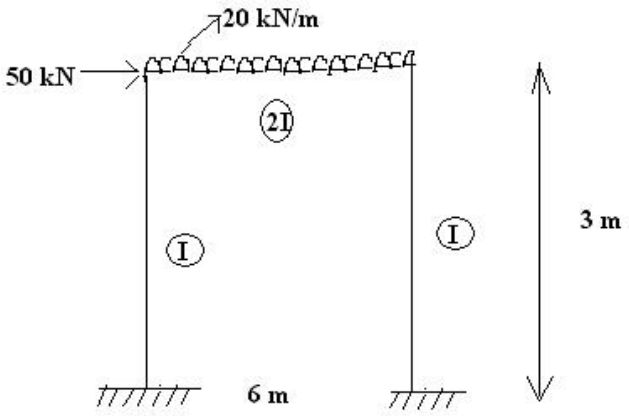

Fig.2 14M

6. Analyse the continuous beam using Flexibility method, shown in Fig.3 and draw shear force and bending moment diagrams. Assume constant EI throughout the beam.

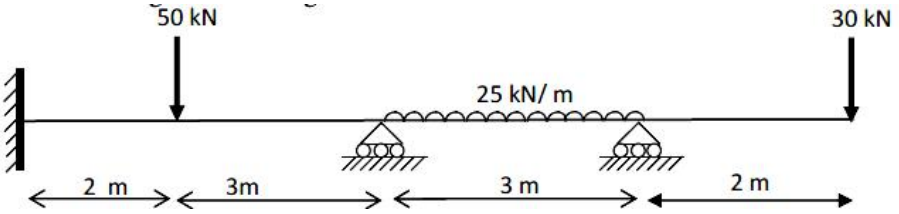

Fig.3 14M

7. Analyse the continuous beam shown in Fig.4 using stiffness method and draw the bending moment diagram. Assume constant EI throughout the beam.

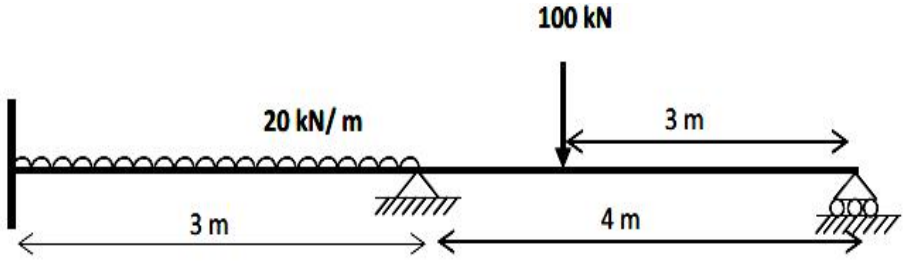

Fig.4 14M

8. Determine the plastic moment carrying capacity required for the continuous beam ABCD of span 12 m. The beam is fixed at A, and has rollers at B, C, D. Span AB= 5m, BC= 4m and CD= 3m. The beam carries point load of 40 kN at a distance of 3m from A, 60 kN at a distance of 2 m from B and udl of 40 kN/m over span CD. Assume same section throughout. 14M

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