Hall Ticket Number :										

R11/R13

Code: 1G682

IV B.Tech. II Semester Regular & Supplementary Examinations April 2017

Advanced Structural Engineering

(Civil Engineering)

Max. Marks: 70 Time: 3 Hours

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

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1. Design an interior panel of a flat slab with panel size 5 m × 5m supported by columns of size 500 mm × 500 mm. Provide suitable drop and column head, if the columns are of 500 mm diameter. Take live load as 4 KN/m^2. Use M-20 concrete and Fe-415 steel. Sketch the reinforcement details.

2. Design a bunker to store 500 tonnes of coal using M20 concrete and Fe415 steel. The Angle of repose and unit weight of coal may be taken as 30^o and 8000N/m^3 respectively. The stored coal is surcharged at its angle of repose.

3. Design a chimney of height 30 m having external diameter of 2.6 m throughout the height. The chimney has fire brick lining of 100 mm thickness provided upto a height of 24 m above base, with air gap of 100mm.The temperature of gases above surrounding air is 240^oC. Take coefficient of thermal expansion 11 × 10^{-6}/ ^oC. Use M25 grade concrete mix.

4. Design an Intz-type tank of 60,000 litres capacity. The height of tank above general ground level is 12 m. The bearing capacity of soil may be assumed as 120 KN/m^2. Use M20 concrete and HYSD bars.

5. Design a rectangular water tank of size 5 m × 8 m × 3 m deep resting on firm round. The tank is open at the top and the walls are rigidly fixed to the base.

6. Design a cantilever retaining wall to retain earth for a height of 3 m above ground level. The backfill is horizontal. The density of soil is 18 KN/m^3. Safe bearing capacity of soil is 100 KN/m^2. Take the co-efficient of friction between concrete and soil as 0.5. The angle of repose is 30°. Use M20 concrete and Fe415 steel.

7. A reinforced concrete grid floor is to be designed to cover a floor area of size 18 m × 12 m. The spacing of the ribs in mutually perpendicular direction is 2 m C/C. Live load = 2.5 KN/m^2. Use M-20 concrete and Fe-415 steel. Analyze the grid floor for moments and shears by Rankine Grashoff method. Design the floor completely.

8. Design the stairs for a public building, supported on wall on one side and stringer beam on the other side. The horizontal span of stairs is 1.5 m. The rise is 120mm and tread is 300 mm. Assume M25 grade concrete and Fe415 steel.

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Hall Ticket Number :										

R11/R13

Code: 1G683

IV B.Tech. II Semester Regular & Supplementary Examinations April 2017

Remote Sensing and GIS Applications

(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) Explain the principle of determination of height of an object using parallax with a neat figure. 8M
   b) Write short notes on aerial photogrammetry. 6M

2. a) Explain the principle of active and passive remote sensing with a neat sketch. 12M
   b) Give any two specific applications of microwave remote sensing. 2M

3. Explain with neat figure the energy matter interaction in the space and in the study area. 14M

4. a) Explain briefly the functions of Geographic Information System 10M
   b) Define the following terms
      (i) Neighbourhood operations
      (ii) Overlay Analysis 4M

5. a) Write a short notes on feature based GIS mapping. 8M
   b) List any five different types of data's that can be used in GIS for mapping 6M

6. a) Compare the Computational Analysis Methods and Visual Analysis Methods in GIS Spatial Analysis 10M
   b) Brief any one data manipulation technique in GIS 4M

7. a) Explain briefly the applications of GIS in ground water modelling. 7M
   b) Explain in detail the application of RS & GIS in flood management. 7M

8. Explain the sequence of steps involved in preparing the Landuse/ Landcover mapping using Remote sensing and GIS. 14M

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Hall Ticket Number :										

R11/R13

Code: 1G689

IV B.Tech. II Semester Regular & Supplementary Examinations April 2017

Pre-Stressed Concrete

(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) What are the Basic principles of Pre-tensioning and Post-tensioning? What are its advantages? 7M

b) Explain neatly which type of Steel and Concrete is used in Pre-stressed concrete? 7M

2. a) What is the difference between Pre-tensioning and Post-tensioning? 7M

b) Explain neatly with a neat sketch the Gifford-Udall System of Prestressing? 7M

3. a) What are the types of losses in Pre-stressed concrete? What is the loss of stress due to length and curvature effects? 7M

b) A prestressed concrete beam of rectangular section 120mm wide and 300mm deep is prestressed by 6 wires of 6mm diameter, provided at an eccentricity of 55mm.The initial stress in the wires is 1150 N/mm^2 .Find the loss of stress in steel due to creep of concrete. Take $E_s=2\times10^5$ N/mm^2, $Ec=3\times10^4$ N/mm^2, $\phi=1.50$. 7M

4. A Rectangular concrete beam 150mm×300mm deep spanning over a span of 9.0 m, is pressed by straight cable carrying an effective prestressing force of 280 KN located at an eccentricity of 50 mm. The beam supports a live load of 2 KN/m. Calculate the extreme stresses at mid span of the beam. 14M

5. Explain the design procedure of I-section according to IS code. 14M

6. A Prestressed concrete beam of rectangular cross section 400mm x 800mm deep is Prestressed ,by 2 post tension cables area 600mm^2 each initially. Stressed to 1400N/mm^2. The span of the beam is 10 m. if f_{ck} =30 N/mm^2. Estimate the shear resistance of support section. Use IS 1343 code. 14M

7. a) What is differential shrinkage? Explain its importance in composite construction. 7M

b) How do you compute the shrinkage in composite members? 7M

8 Write short notes on:

a) Factors affecting the deflection of PSC members.
b) Short term deflection.
c) Load-balancing concept.

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Hall Ticket Number :										

R11/R13

Code: 1G681

IV B.Tech. II Semester Regular & Supplementary Examinations April 2017

Design and Drawing of Irrigation Structures

(Civil Engineering)

Max. Marks: 70 Time: 3 Hours

Answer any ***ONE*** question
All Questions carry **equal** marks

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1. Design a tank surplus weir for a major tank constructed with tanks in series:

   Field data:

   Combined catchment area of group of tanks=29.5 Km^2

   Intercepted catchment area= 22.8 Km^2

   General G.L at site=+15.80, level at which good soil for foundation is available=+14.00,

   Ground slopes at the surplus work from its central line reaches +14.80 in a distance of 10 m.

   Construction details:

   Full tank level = +17.5, Maximum water level = + 18.3, Top bund level= + 19.5,

   Top width of bund= 2.0m,

   Side slopes of bund:- U/S= 1.5H:1.0V, D/S= 1.0H:1.0 V

   Other details:

   Make provisions to store water up to maximum water level. Proper abutments, wing walls & returns are to be designed. Assume an hydraulic gradient of 1.0V: 5.0H and Ryve's coefficient of 9.50 for the combined catchment & 1/6 of that for the intercepted catchment**. -25M**

   Draw to a suitable scale:

   (i) Half plan at top & Half plan at foundation **-15M**
   (ii) Half elevation & Half sectional elevation **-10M**
   (iii) C/S of the Weir **-20M**

OR

2. Design a Tank sluice with a tower head taking off from a tank irrigating 225 Hectares at 1050 Hectares/ Cumec duty. Conveyance losses are 15%. The tank bund through the sluice is taking off has a top width of 2.2m with 1.5H: 1.0V side slopes. The top bund level of bund is +80.00, G.L at site= +74.50, Hard soil for foundation is available at +73.50.

   The sill of the sluice at take off is +74.00, Maximum water level in the tank=+78.00, Full tank level=+77.00, average low water level=+75.00.

   The details of the channel below the sluice are:

   Bed level=+74.00, FSL=+74.6, free board=0.6m, bed width=1.20m, side slopes = 1.5H:1.0V with top of bank at +75.00. Top width= 1.0m.

   Draw to a suitable scale:

   (i) Section of embankment showing all the details **-20M**
   (ii) Half plan at top & Half plan at foundation **-15M**
   (iii) U/S end view Half in section & Half in elevation **-10M**

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