Hall Ticket Number :										

R11

Code: 1G681

IV B.Tech. II Semester Regular & Supplementary Examinations Mar/Apr 2016

Design & Drawing of Irrigation Structures

(Civil Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *any One* question

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1. Design and draw a sluice taking off from a tank irrigating 600 hectares at 3000 duty. The tank bund through which the sluice is taking off has a top width of 2 m with 2:1 side slopes. The top level of bank is +40.20 and the ground level at site is +34.50. Good hard soil for foundation is available at +33.50. The sill of the sluice at off-take is +34.00. The maximum water level in tank is +38.00. The full tank level is +37.00. Average low water level of the tank is +35.00. The details of the channel below the sluice are as under. Bed level +34.00, FSL +34.50, Bed width 1.25 m and side slopes are 1½ to 1 with top of bank at +35.50.

2 Design and draw the Syphon Aqueduct for the following data.

Drainage details: Maximum flood discharge: 85 m^3/s, High Flood Level: +39.75, Average bed level: +38.00, Hard soil for foundation at: +37.00

Canal details: Discharge: 40 m^3/s, Bed width: 20 m, Bed level: +40.00, Full supply level: +42.00, Ultimate bed level: +39.75, Ultimate Full supply level: +42.50, Average velocity in canal: 0.85 m/s, Left bank top width: 5.00 m, Right bank top width: 2.00 m, Canal side slopes are 2 in 1, Top of canal bank: +43.50, Average ground level at the site is +38.00.

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Hall Ticket Number :										

R11

Code: 1G682

IV B.Tech. II Semester Regular & Supplementary Examinations Mar/Apr 2016

Advanced Structural Engineering

(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. Design an interior panel of a flat slab of size 5mx5m with drop panels over columns of size 500x500mm^2. The live load on the panel is 4KN/m^2. Use M20 concrete and Fe 415 steel, providing two-way reinforcement. Sketch the details of reinforcement. 14M

2. Design the sidewall and hopper bottom of a circular cylindrical bunker of 300KN capacity to store coal. Unit weight of coal is 8.4 KN/m^3 and angle of repose is 30^0. The surcharge angle of coal is that of the angle of repose. Use M20 grade concrete and Fe 415 steel. 14M

3. Design a RC chimney of 45m height having an external diameter of 3.5m throughout the height. It has a firebrick lining of 100mm thickness provided upto a height of 38m above the base, with an air gap of 100mm. Assume temperature difference as 250^{0}C and $\alpha = 11x10^{-6}/\ ^0C$ and $E_s = 2x10^5$ N/mm^2. Use M 20 grade concrete. 14M

4. Design the following components of an Intz tank of capacity 7,50,000 lts. The height of staging is 10m upto the bottom of the tank. Use M20 concrete and Fe 415 steel. **a)** Top dome **b)** Top ring beam and, **c)** Cylindrical wall. 14M

5. Design a rectangular water tank 5m wide, 8m long and 3m deep. The tank is opened at the top and walls are rigidly fixed to the base, which rests on firm ground. Use M20 concrete and Fe 415 steel. Sketch the reinforcement details. 14M

6. Design a cantilever retaining wall of 5m stem to retain earth upto its top. The density of soil is 19 KN/m^3 and the angle of repose is 30^0. The safe bearing capacity of soil is 150 KN/m^2 and the coefficient of friction between the soil and the base slab is 0.5. Design the wall using M20 concrete and Fe 415 steel. Sketch the reinforcement details. 14M

7. A RC grid floor is to be designed to cover a floor area of size 12m x 8 m. The spacing of the ribs in mutually perpendicular direction is 2m centre to 14centre.The live load is 3KN/m^2. Use M20 concrete and Fe 415 steel. Analyze the grid floor for moments and shear by Rankine-Grashoff method. Design the floor and sketch the details of reinforcement. 14M

8. Design a staircase of 1.8m width for an office building with each step built into the wall with a bearing of 150mm along the flight with tread of 250mm and rise of 200mm. Use M20 concrete and Fe 415 steel. 14M

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Hall Ticket Number :										

R11

Code: 1G683

IV B.Tech. II Semester Regular & Supplementary Examinations Mar/Apr 2016

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.		Describe the Principle and types of aerial photographs?	14M
2.		Explain electromagnetic spectrum with neat sketch?	14M
3.		Describe Image interpretation Image elements and terrain elements with neat sketches?	14M
4.	a)	Define GIS and Explain components of GIS?	7M
	b)	Explain theoretical framework for GIS with neat sketch?	7M
5.		Explain briefly Raster and Vector data structures in GIS?	14M
6.		Explain briefly Integrated analysis of the spatial and attribute data with suitable case study?	14M
7.		How can you prepare water resources mapping using Remote sensing and GIS Explain with step by step methodology?	14M
8.		Define Fluvial Geomorphology and How can you prepare water quality mapping using Remote sensing and GIS Explain with suitable case study?	14M

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Hall Ticket Number :										

R11

Code: 1G689

IV B.Tech. II Semester Regular & Supplementary Examinations Mar/Apr 2016

Pre-Stressed Concrete

(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. a) Explain about pretensioning system and post tensioning system with neat sketches. 7M

   b) Draw stress - strain curves for reinforcing and prestressing steels and also enlight the salient features. 7M

2. a) Discuss about Magnel system with neat sketches. 7M

   b) Enumerate the differences between pre tensioned and post tensioned members. 7M

3. a) A concrete beam is pre-stressed by a cable carrying an initial pre-stressing force of 300 kN. The cross-sectional area of the wires in the cable is 300 mm^2. Calculate the percentage loss of stress in the cable only due to shrinkage of concrete using IS: 1343 recommendations assuming the beam to be,

      i. pre-tensioned and

      ii. post-tensioned.

      Assume E_s = 210 kN/mm^2 and age of concrete at transfer = 8 days. 9M

   b) List out the types of losses in prestress in detail. 5M

4. A prestressed concrete beam with a rectangular section 130 mm wide by 320 mm deep supports a uniformly distributed load of 6 kN/m, inclusive of self-weight of the beam. The effective span of the beam is 8 m. The beam is concentrically prestressed by a cable carrying a force of 200 kN. Locate the position of the pressure line in the beam. 14M

5. a) A rectangular concrete beam 300 mm wide, 800 mm deep supports two concentrated loads of 20 kN each at third point of a span of 9 m.

      i) Suggest a suitable cable profile. If eccentricity of the cable profile is 100 mm for middle third portion of the beam, calculate the prestressing force required to balance the bending effect of the concentrated loads neglecting the self-weight.

      ii) For the same cable profile find effective force in cable, if the resultant stress due to self-wt., imposed load, and prestressing force is zero at the bottom fiber of mid span section.(Assume density of concrete=24 kN/m^3) 8M

   b) Explain the concept of load balancing. 6M

6 The end block of a post tensioned beam is 90mm wide and 180mm deep. A prestressing wire, 8 mm in diameter, stressed to 1400 N/mm^2 has to be anchored against the end block at the centre. The anchorage plate is 50mm x 50mm. The wire bears on the plate through a female cone of 20mm diameter. Given the permissible stress in concrete at transfer, f_{ci} as 20 N/mm^2 and the permissible shear in steel as 94.5 N/mm^2, determine the thickness of the anchorage plate. 14M

7 A pretensioned beam 250 mm wide and 300 mm deep is prestressed by 12 wires each 7 mm diameter, initially stressed to 1200 N/mm^2 with their centroids located 100 mm from the soffit. Estimate the final percentage loss of stress due to elastic deformation, creep, shrinkage and relaxation using IS: 1343 code using the following data:

Relaxation of steel stress = 90 N/mm^2, E_s = 210 kN/mm^2, E_c = 35 kN/mm^2, Creep coefficient = 1.6, Residual shrinkage strain = 3 x 10^{-4} 14M

8 a) A pretensioned prestressed concrete beam having a rectangular section, 150 mm wide and 350 mm deep, has an effective cover of 40 mm. If fck= 40 N/mm^2, fp= 1600 N/mm^2, and the area of prestressing steel A_p = 461 mm^2, calculate the ultimate flexural strength of the section using IS: 1343 code provisions 9M

b) Discuss about the factors influencing deflections. 5M

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