Hall Ticket Number :										

R-11 / R-13

Code: 1G681

IV B.Tech. II Semester Supplementary Examinations December 2017

Design and Drawing of Irrigation Structures

(Civil Engineering)

Max. Marks: 70 Time: 3 Hours

Answer any **one** question carry **70 Marks**

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1. Design a Tank sluice with a tower head with the following data and give a neat sketch of the drawing with a longitudinal section across the tank bund showing the barrel etc.

   Tank Bund top level = +45.00m.

   Ground level = +40.00m

   Level of hard soil = + 39.00m

   Tank bund top width = 2.0m

   Side slopes of tank bund = 2H : 1V

   Sill level at sluice = +39.5m

   Thickness of roof slab of sluice = 15cm

   M.W.L of tank = +43.50m

   FTL of tank = + 42.5m

   Average water level = + 40.50m

   Channel below the sluice:

   Bed level = + 39.50m, FSL = +40.00m

   Top of bund = + 41.00m

   Bed width = 2m, channel side slopes = 1/2H : 1V

   Assume any other details suitably.

2. Design details of a canal regulator is as follows:

Particulars	U/S	D/S
Full supply discharge	18.0 m^3/s	15.0 m^3/s
Bed width	12.0 m	12.0 m
Full supply level	+12.0 m	+12.0 m
Top bank level	+13.0 m	+13.0 m
Bed level	+10.0 m	+10.0 m
Top width of bank	2.0 m	2.0 m
Sides slopes	2 : 1	2 : 1

   Bligh's coefficient = C= 10

   General ground level at the site = +12.0 m

   Good soil for foundation is available at +9.0 m

   Splayed wingwalls are to be provided.

   Design the vent way, Gates, Apron, & Protection works.

   Draw to suitable scale, the following views:

   (i) Half longitudinal section and half longitudinal elevation.

   (ii) Half plan at top & half at foundation.

   (iii) Sectional elevation through regulator vent.

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Hall Ticket Number :										

R-11 / R-13

Code: 1G689

IV B.Tech. II Semester Supplementary Examinations December 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) Discuss the general principles of prestressing the concrete. 4M

   b) What are the advantages and limitations of Prestressed Concrete? 5M

   c) Why high strength concrete and high tensile steel are recommended for prestressed concrete? 5M

2. a) Explain the methods (i) Pre-tensioning , (ii) Post-tensioning 6M

   b) Write short notes on Hoyer system and Freyssinet system 8M

3. A pre-tensioned beam 250 mm wide 400 mm deep is pre-stressed by 12 wires, each of 8 mm diameter initially stressed to 1200 N/mm^2 with their centroids located 100 mm from the soffit. Estimate the percentage of loss of stress due to elastic deformation, creep, shrinkage and relaxation for the following data:

   Relaxation of steel stress = 90 N/mm^2

   E_0= 201 kN/mm^2

   E_c= 35 kN/mm^2

   Creep Co-efficient (Ø) =1.6

   Residual Shrinkage strain = 3 x 10 $^{-4}$ 14M

4. A prestressed concrete beam of 120 mm wide and 300 mm deep is used over a span of 6m to support a UDL of 4 kN/m including its self-weight. The beam is prestressed by a straight cable carrying a force of 180 kN and located at an eccentricity of 50 mm. Determine the location of the thrust line in beam and plot its position at quarter and central span sections. 14M

5. A prestressed concrete beam of effective span 16 m is of rectangular section 400 mm wide and 1200 mm deep. A tendons consists of 3300 mm^2 of strands of characteristic strength 1700 N/mm^2 with an effective pre stress of 910 N/mm^2. The strands are located 900 mm from the top face of the beam. If F_{cu}= 60 N/mm^2, estimate the flexural strength of the section. 14M

6. The end block of post tensioned concrete beam 300 mm x 300 mm is subjected to a concentric anchorage force of 700 kN by a freyssinet system of area 1100 mm^2. Discuss and detail the anchorage reinforcement for the end block. 14M

7. a) Sketch any two forms of shear connectors used in pre-stressed concrete composite beams and mention its merits. 6M

   b) Elaborate different types of composite construction of prestressed concrete members with sketches. 8M

8. A rectangular concrete beam 150 mm wide 300 mm deep and 6 m span with 90 mm radius of gyration is prestressed by 8 wires of 8 mm diameter by 400 kN forces. The tendon eccentricity at mid span is 75 mm and zero at supports. The beam supports an UDL of 5 kN/m over the entire span. Determine the magnitude of central deflection for the following cases, ignoring all losses in prestress.

   (i) Self weight + Prestress

   (ii) Self weight + Prestress + Imposed Load 14M

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Hall Ticket Number :										

R11/R13

Code: 1G683

IV B.Tech. II Semester Supplementary Examinations December 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 photogrammetry with a neat figure.	10M
	b)	What are the differences between aerial photographs and maps?	4M
2.	a)	Explain the different parts of Electromagnetic spectrum with their uses in satellite remote sensing	10M
	b)	Write short notes on spectral reflectance curve.	4M
3.		Detail the following (i) Spatial resolution (ii) Spectral resolution (iii) Radiometric resolution and (iv) Temporal resolution	14M
4.	a)	Explain the components of GIS	10M
	b)	Define the terms (i) Attribute data (ii) Mosaic	4M
5.		Differentiate raster and vector data models with their advantages and limitations.	14M
6.		Explain the integrated analysis of spatial and attribute data.	14M
7.	a)	Explain in detail of generating different thematic maps in watershed prioritization.	10M
	b)	List the uses of remote sensing & GIS in different stages of finding the runoff potential indices of watersheds.	4M
8.	a)	Define Fluvial Geomorphology.	2M
	b)	Explain in detail the role of Remote sensing and GIS in water resources management.	12M

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Hall Ticket Number :										

R-11 / R-13

Code: 1G682

IV B.Tech. II Semester Supplementary Examinations December 2017

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 flat slab for a live load of 4500 N/m^2. Drops shall be provided. All panels are 6m×6m. Use M20 concrete and mild steel reinforcements. Use M 25 concrete and Fe 415 steel. 14M

2. Design a bunker to store 300 kN of coal, for the following data. Unit weight of coal = 8340N/m^3, angle of repose = 30 degrees. The stored coal is to be surcharged at its angle of repose. Take permissible stress as 140 N/mm^2. 14M

3. A reinforced concrete chimney 100 m high above ground has an external diameter 4m at the top and 5m at the ground level. The thickness of concrete shell varies from 200mm at the top to 400 mm at the bottom. The wind pressure at site may be taken as 2 kN/m^2 . Assuming a modular ratio of 15, design suitable reinforcements in the shell walls. 14M

4. A reinforced concrete Intze type water tank is required to store 250,000 litres of water. Height of staging is 13 m above ground level. The tank is supported on six columns. Safe bearing capacity of soil is 150 kN/m^2. Basic wind pressure is 1.5 kN/m^2. Adopting M25 grade concrete and Fe 415 steel, Design the top dome , top ring beam and cylindrical wall of the tank. 14M

5. A circular tank has an internal diameter of 10m and has maximum height of water as 4m. The walls of the tank are restrained at the base. Determine the values of maximum hoop tension and its location, and the maximum cantilever bending moment. 14M

6. Design a counterfort retaining wall for the following data.
   Height of wall above ground = 8m,
   Depth of foundation = 1.5m,
   Safe bearing capacity = 200 kN/m^2
   Unit weight of earth fill= 18 kN/m^3
   Surcharge angle = 18 degrees,
   Angle of internal friction for back fill = 30 degrees,
   Face to face spacing of front counter forts = 2m,
   Face to face spacing of front counter forts, provided upon ground level = 2m,
   Co efficient of friction between soil and concrete = 0.55.
   Use M20 mix and Fe 415 steel. 14M

7. A reinforced concrete grid floor of size 9m x 12m is required for an assembly hall. Assuming rib spacing of 1.5m in the short span direction and 2m in the long span direction, design the grid floor. Adopt M25 grade concrete and Fe 415 HYSD bars. Live load is 4 kN/m^2. 14M

8. Explain the steps involved in the design of slabless tread-riser stair case. 14M

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