| Hall Ticket Number : | | | | | | | | | | |
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**R-14**

**Code: 4G682**

IV B.Tech. II Semester Advanced Supplementary Examinations May/June 2018

# Advanced Structural Engineering

( 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 flat slab floor system consisting of seven panels in each direction supports live and finish loads of 4 KN/$m^2$ respectively. the supporting columns are of 550 mm diameter with storey height of 3 m Design an interior panel of size 7.5x 6 m with appropriate column heads and drops. The materials used are M20 concrete and HYSD steel of grade Fe 415

**OR**

2. A circular bunker of capacity 200 KN to storage coal. The angle of Repose of coal is $25^0$. M20 grade concrete and HYSD steel of grade Fe 415

**UNIT–II**

3. Calculate Area of steel required at every section and stress and loading on Intz tank components

   1.Capacity of the tank, – 250 $m^3$

   2. Diameter of the tank, – 9 m

   3. Height of Cylindrical Wall -3.6m

   4. Depth of water – 3.6 m

   5. Rise of Top Dome – 1.8 m

   6. Height of bottom dome – 1.3 m

   7. Height of Conical dome – 1.5 m

   8. Number of columns- 06

   9. Base diameter of the tank, m-7.6 6m

   Grade of Concrete- M20

   Grade of Steel-Fe415

**OR**

4. Design a circular water tank 3.5 m high, resting on the ground to store 60,000 liters of water. Use M 25 grade of concrete and Fe 415 steel. Draw reinforcement details

**UNIT–III**

5. Deign a counter fort retaining wall to retain earth 4.5 m above ground level using the following data: Spacing of counter forts = 3 m c/c The density of earth = 16 kN/$m^2$, Angle of internal friction = $25^0$. The safe bearing capacity of soil = 175 kN/$m^2$, The coefficient of friction between soil and concrete = 0.5 Use M20 grade of concrete and Fe 415 steel

**OR**

6. Design a rectangular reinforced concrete water tank of size 5 m× 4 m resting on the ground with an open top for a capacity of 75, 000 liters. Draw the reinforcement details. Use M 20 grade of concrete and Fe 415 steel

**UNIT–IV**

7. Design a chimney of height 60 m, using the following data:
External diameter: At top= 4 m
At base= 5 m
Shell thickness: At top = 250 mm
At base = 500 mm
Thickness of fire brick lining = 100 mm
Air gap = 100 mm
Temperature difference = $75^0$
Wind intensity = 1.75 kN/$m^2$.

**OR**

8. Design a cantilever retaining wall to retain earth 3.5 m high above ground level, using the following data: The density of earth is = 20 KN/m2 Angle of internal friction is = $25^0$ The safe bearing capacity of soil is = 150 kN/m2 The coefficient of friction between soil and concrete is = 0.45 Use M 25 grade of concrete and Fe 415 steel

**UNIT–V**

9. A reinforce rectangular grid floor is 12m X 16 m with the center to center spacing of the ribs at 2 m both ways. Determine the bending moments and shears at the salient points. Assume slab thickness is approximately 1/$20^{th}$ span, total load including self-weight is 6.5 KN/$m^2$, and fck = 20 N/$mm^2$, and it is simply supported on all the four sides

**OR**

10. Design a flight between landing to landing of a tread-riser type of staircase, with 10 risers, each 150 mm and with tread of 270 mm. The upper and lower landings are 1200 mm wide each supported on 230 mm thick masonry walls at the edges, parallel to the risers. M20 grade concrete and Fe415 steel

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**R-14**

**Code: 4G681**

IV B.Tech. II Semester Advanced Supplementary Examinations May/June 2018

# Design and Drawing of Irrigation Structures

( Civil Engineering )

Max. Marks: 70 Time: 3 Hours

Answer any one question from the following ( 1 x 70 = 70Marks )

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1. Design a sluice taking off from a tank irrigating 200 hectares at 1000 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 the bank is +40.00 m. and the ground level at the site is +34.50 m. Good hard soil for foundation is available at +33.50 m.

   The still of the sluice at off-take is +34.00 m. The maximum water level in the tank is 38.00 m. The full tank level is +37.00 m. Average low water level of the tank is +35.00m. The details of the channel below the sluice are as under.

   Bed level: +34.00m.

   F.S.L. : +34.50m.

   Bed width: 1.25 m.

   Side slopes: 1½ to 1 with top of bank at +35.50 m.

   Draw to a suitable scale:

   (i) Half plan at top and half plan at foundation level and

   (ii) Longitudinal section of the tank sluice.

**OR**

2. Design a Canal regulator-cum-road bridge with the following data:

   Hydraulic particulars of canal upstream:

   Full supply discharge: 20 $m^3/s$

   Bed width : 15 m ; Bed level : +20.00 m.

   F.S. depth: 2.00 m ; F.S.L.: +22.00 m.

   Top level of bank: 23.00 m.

   The right bank is 5 m wide and left bank is 2 m wide.

   Hydraulic particulars of canal downstream:

   Full supply discharge: 16 $m^3/s$

   Bed width: 15 m ; Bed level: +20.00 m.

   F.S. depth: 1.75 m ; F.S.L.: +21.75 m.

   Top level of bank: +22.75 m.

   Top widths of banks are the same as those on the upstream side. The regulator carries a road way single lane designed for I.R.C. loading class 'A'. Provide clear freeboard of 1 m. above F.S.L. for the road bridge. Good foundation soil is available at +19.00 m.

   Assume the ground level at the site as +22.00 m.

   Draw to a suitable scale:

   (i) Half plan at top and half plan at foundation level and (ii) Section through the regulator vent.

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**R-14**

**Code: 4G689**

IV B.Tech. II Semester Advanced Supplementary Examinations May/June 2018

# Pre-stressed Concrete

( 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) Describe the general principles of pre- tensioning of structures. 7M
   b) Explain the applications of pre-stressed concrete in civil Engineering. 7M

**OR**

2. a) Discuss the principles involved in Udall system of pre-stressing. 7M
   b) Summarize the characteristics of the materials required for making pre-stressed concrete. 7M

**UNIT–II**

3. a) Explain the loss in pre-stressed concrete members due to relaxation of steel. 7M
   b) Explain the loss in pre-stressed concrete members due to slip in anchorage. 7M

**OR**

4. Explain the Indian standard codal provisions for the calculation of anchorage zone stresses in PSC beams. 14M

**UNIT–III**

5. A rectangular concrete beam of cross section 30 cm deep and 20 cm wide is Pre-stressed by means of 15 wires of 5mm diameter located 6.5 cm from the bottom of the beam and 3 wires of diameter of 5 mm,2.5cm from the top. Assuming the pre-stress in the steel as 840 $N/mm^2$ ,calculate the stresses at the extreme fibres of the mid span section when the beam is supporting its own weight over a span of 7 m. If a uniformly distributed live load of 7 kN /m is imposed, evaluate the maximum working stress in concrete. The density of concrete is 24 $kN/m^3$ . 14M

**OR**

6. A concrete beam of rectangular section having a width of 300 mm and depth 550mm, is pre stressed by a cable carrying a force of 750 kN at an eccentricity of 100mm. If the beam supports a live load of 20 kN/m over a effective span of 7m, estimate the resultant stress at the top and bottom fibres at mid span section due to the effect of pre-stress, dead and live loads. Assume unit weight of concrete as 24 $kN/m^3$. 14M

**UNIT–IV**

7. A post tensioned pre stressed concrete beam for the roof of an industrial structure has a simply supported span of 25m. The beam has to support a dead load of 2.5 kN/m, together with an imposed load of 15 kN/m in addition to the self-weight. The grade of concrete specified is M-40. The compressive strength of concrete at transfer is 35$N/mm^2$. The loss ratio is 0.80. The 64 mm cables containing 7 – 15mm strands with an ultimate load capacity of 1750 kN are available, Using IS:1343 provisions, design the cross section of the girder to comply with various limit states. 14M

**OR**

8. Discuss the steps involved in the design of pre stressed concrete I-section beams as per IS code. 14M

**UNIT–V**

9. The end block of a pre stressed beam 500mm wide and 1050 mm deep contains 6 Freyssinet cables, each carrying a force of 266 kN anchored through 100mm diameter anchorages, which are spaced 150mm apart at the end of the beam. Calculate the maximum tensile stress and the bursting tension and design the reinforcement for the end block using Rowes method. Adopt yield stress in mild steel reinforcement as 260$N/mm^2$. 14M

**OR**

10. The end block of a pre-stressed concrete beam, rectangular in section, is 150 mm wide and 250mm deep. The pre-stressing force of 100kN is transmitted to concrete by a distribution plate,100mm wide and 50mm deep, concentrically located at the ends. calculate the position and magnitude of the maximum tensile stress on the horizontal stress through the centre and edge of the anchor plate. compute the bursting tension on these horizontal planes. 14M

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**R-14**

**Code: 4G683**

IV B.Tech. II Semester Advanced Supplementary Examinations May/June 2018

# Remote Sensing and GIS Applications

( 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. Describe briefly on different types of Map and explain Mosaic role on preparation of Map? 14M

**OR**

2. Give brief note on Principles of aerial photographs? 14M

**UNIT–II**

3. Explain briefly spectral properties of water bodies? 14M

**OR**

4. Explain briefly Different types of Resolutions? 14M

**UNIT–III**

5. Give brief note on GIS Types of data Representation? 14M

**OR**

6. Describe briefly on GIS categories and components of GIS? 14M

**UNIT–IV**

7. Describe briefly on GIS Computational Analysis Methods? 14M

**OR**

8. Give brief note on GIS Visual Analysis Methods? 14M

**UNIT–V**

9. Explain briefly watershed Management using Remote sensing and GIS? 14M

**OR**

10. Describe briefly on Drought impact assessment and monitoring using Remote sensing and GIS? 14M

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