

**Code: 1G682**

IV B.Tech. II Semester Supplementary Examinations Nov/Dec 2018

**Advanced Structural Engineering**

(Civil Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any **five** questionsAll Questions carry equal marks (**14 Marks** each)

Assume suitable data, if necessary

\*\*\*\*\*

1. Design an interior panel of a flat slab for a live load of 6 kN/m<sup>2</sup>. Provide two way reinforcements. Use M<sub>20</sub> grade concrete.
2. Design a circular cylindrical bunker of capacity 400 kN to store coal using M<sub>20</sub> concrete and Fe<sub>415</sub> steel. Angle of repose 25°, unit weight of coal 8 kN/m<sup>3</sup>. Coefficient of friction between coal and concrete is 0.444.
3. Design a chimney of 66 m height, having external diameter of 4 m throughout the height. The chimney has fire brick lining of 100 mm thickness provide up to a height of 42 m above ground level, with an air gap of 100 mm. The temperature of the gasses above surrounding air is 200°C. Take coefficient of expansion of concrete and steel is  $11 \times 10^{-6}/^{\circ}\text{C}$  and  $E_s=2.05 \times 10^5 \text{ N/mm}^2$  Use M<sub>25</sub> grade of concrete
4. Design an Intz type water tank of capacity 9,00,000 liters capacity supported on symmetrically placed 8 columns. M<sub>25</sub> concrete and Fe<sub>415</sub> steel.
5. A rectangular water tank 4.5 m long, 2.25 m wide and 2.25 m high has into walls tightly jointed at the vertical edges and pin jointed at their horizontal edges. Design the tank if it is supported on all sides under the wall. Use M20 grade concrete and HYSD bars Fe-415 steel.
6. Design a cantilever retaining wall to retain an earth embankment with a horizontal top 3.0m above ground level. Density of earth = 18 kN/m<sup>3</sup>, Angle of internal friction  $\phi = 30^{\circ}$  SBC of soil is 180 kN/m<sup>2</sup>. Take coefficient of friction between soil and concrete = 0.5. Take M<sub>20</sub> concrete and Fe<sub>415</sub> steel.
7. A R.C concrete grid floor of size is required for a function hall. The floor is subjected to a live load of 3 kN/m<sup>2</sup>. Assume rib spacing of 1.5 m in both directions. Design the grid floor, use M<sub>20</sub> concrete and Fe<sub>415</sub> steel
8. Design a straight stair for a residential building of individual steps projecting 950 mm from the face of wall. The rise and tread of the stairs are 180 mm and 260 mm respectively. The live load may be taken as 3 kN/m<sup>2</sup>. Adopt M20 grade concrete and Fe-415 grade steel.

\*\*\*

--	--	--	--	--	--	--	--	--	--

**Code: 4G682**

IV B.Tech. II Semester Supplementary Examinations Nov/Dec 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 )

\*\*\*\*\*

**UNIT-I**

1. Design an interior panel of a flat slab for a live load of  $6 \text{ kN/m}^2$ . Provide two way reinforcements. Use  $M_{20}$  grade concrete.

**OR**

2. Design a circular Bunker to store 30 tons of coal. Density of coal is  $9 \text{ kN/m}^3$  and angle of repose of  $30^\circ$ . Use  $M_{20}$  concrete and  $Fe_{415}$  steel. Sketch the reinforcement details. Assume required data.

**UNIT-II**

3. Design an Intz type water tank of 1.5 million liters capacity, supported on 8 columns. The base of tank is 16 m above ground level. Depth of foundation 1 m below ground level. Adopt  $M_{25}$  grade of concrete and  $Fe-415$  grade steel. The design of the tank should confirm to the stresses specified in IS: 3370 and IS: 456.

**OR**

4. Design a R.C chimney of height 60 m and check the stresses. Diameter of chimney, external is 4.3 m, internal 4.0 m, air gap is 100 mm. Thickness of five brick lining 100 mm, temperature difference  $75^\circ\text{C}$  Coefficient of thermal expansion  $11 \times 10^{-6} / ^\circ\text{C}$

**UNIT-III**

5. Design a circular water tank flexible base resting on the ground to store 50,000 litres of water. The depth of tank may be kept 4m. Use  $M_{25}$  concrete and  $Fe 415$  steel.

**OR**

6. Design a counterfort retaining wall to support an earth fill of 6.0 m height above ground level. The safe bearing capacity of soil in  $160 \text{ kN/m}^2$ . The unit weight of soil of  $16 \text{ kN/m}^3$  and at an angle of shearing resistance of 33. Assume value of coefficient of friction as 0.55. Spacing of counter forts is 3.0m centre to centre. Adopt  $M_{20}$  grade concrete and  $Fe-415$  grade steel.

**UNIT-IV**

7. Design an R.C grid floor (12 m x 18 m) to carry a live load of  $2 \text{ kN/m}^2$  using  $M_{20}$  grade concrete and  $Fe-415$  grade steel. The spacing of ribs in both directions is 1.5 m c/c. Sketch the reinforcement details by taking cross-section of grid.

**OR**

8. Design cantilever stem and heel slab of a cantilever retaining wall to retain leveled soil of 4 m height over the ground level. The density of soil is  $18 \text{ kN/m}^3$  and the angle of repose is  $30^\circ$ . The safe bearing capacity of soil is  $200 \text{ kN/m}^2$ . Use  $M-20$  concrete and  $Fe-415$  steel. Sketch the reinforcement details

**UNIT-V**

9. Design a straight stair for a residential building of individual steps projecting 950 mm from the face of wall. The rise and tread of the stairs are 180 mm and 260 mm respectively. The live load may be taken as  $3 \text{ kN/m}^2$ . Adopt  $M_{20}$  grade concrete and  $Fe-415$  grade steel.

**OR**

10. A stair case 1.2 m width for an office building consists of each step built into the wall with a bearing of 110 mm along the flight with the tread 250 mm and rise of 200 mm. Design the stair case. Use  $M_{20}$  concrete and  $Fe_{415}$  steel.

\*\*\*

--	--	--	--	--	--	--	--	--	--

**Code: 4G689**

IV B.Tech. II Semester Supplementary Examinations Nov/Dec 2018

**Prestressed 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 )

\*\*\*\*\*

**UNIT-I**

1. What is the necessity of using high-strength concrete and high tensile steel in prestressed concrete?

**OR**

2. What is the basic principle of prestressed concrete? Explain the advantages of prestressed concrete.

**UNIT-II**

3. Distinguish between creep and shrinkage. What are the factors influencing the creep and shrinkage of concrete?

**OR**

4. A pre tensioned beam 250 mm wide and 300 mm deep is prestressed by 12 wires each 7 mm diameter, initially stressed to 1200 N/mm<sup>2</sup> 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<sup>2</sup>,  $E_s = 210 \text{ kN/mm}^2$ ,  $E_c = 35 \text{ kN/mm}^2$ , Creep coefficient = 1.6, Residual shrinkage strain =  $3 \times 10^{-4}$

**UNIT-III**

5. 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. compute the extreme stresses at mid span of the beam.

**OR**

6. A prestressed concrete beam of section 120 mm wide by 300 mm deep is used over an effective span of 6 m to support a uniformly distributed load of 4 kN/m, which includes the self-weight of the beam. The beam is prestressed by a parabolic cable carrying a force of 180 kN and located at an eccentricity of 50 mm. compute the extreme stress at central span sections and end section.

**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 35N/mm<sup>2</sup>. 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.

**OR**

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

**UNIT-V**

9. a) Explain analysis of end blocks by Guyon's method  
b) Explain about Anchorage Zone Reinforcement

**OR**

10. 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<sup>2</sup>.

\*\*\*

Hall Ticket Number : 

--	--	--	--	--	--	--	--	--	--

**R-14**

**Code: 4G683**

IV B.Tech. II Semester Supplementary Examinations November 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 )

\*\*\*\*\*

**UNIT-I**

1. a) Describe the basic principle and types of aerial photographs?  
b) Differentiate Maps vs Photographs?

**OR**

2. Define parallax. Explain about parallax measurements for heights?

**UNIT-II**

3. a) Explain briefly the concepts and foundation of remote sensing?  
b) Explain electromagnetic spectrum with neat sketch?

**OR**

4. a) Give brief note on energy interactions with atmosphere?  
b) Define sensors and Explain different types of sensors?

**UNIT-III**

5. a) Give brief note on fundamental operations of GIS?  
b) Explain briefly about Raster and Vector data in GIS?

**OR**

6. Describe how many types of data required in GIS for preparation of a map?

**UNIT-IV**

7. Define attribute data and explain data manipulation methods in GIS?

**OR**

8. Define computational analysis methods in GIS?

**UNIT-V**

9. a) Give a brief note on flood and drought impact assessment and monitoring in GIS?  
b) Explain about watershed management for sustainable development?

**OR**

10. a) Describe briefly about identification of sites for artificial recharge structures?  
b) How can you monitor water resources management through GIS?

\*\*\*