Code: 1G682

IV B.Tech. II Semester Advanced Supplementary Examinations June 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
****

1. A flat slab consists of 5 m x 6 m panels and is without drop and column head. It has to carry a live load of $4kN/m^2$ and a finishing load of $1 kN/m^2$. It has to be designed using M20 and Fe415 steel. The size of the columns supporting the system is 500 mm x 500 mm and floor to floor height is 4.5 m. Calculate the design moments in the interior panel and middle strip in both the directions.

2. Design a bunker of capacity 300 kN to store coal using M20 concrete and Fe415 steel. Angle of repose 30°, unit weight of coal is $8300 kN/m^3$.

3. Design a R.C chimney of height 66 m having external diameter of 4 m throughout the height. The chimney has fire brick lining of 100 mm thickness provided upto a height of 42 m above ground level, with air gap of 100mm.The temperature of gases above surrounding air is 200^oC. Take coefficient of thermal expansion $11 \times 10^{-6}/ {}^oC$. Use M25 grade concrete mix.

4. Design an Intz-type tank of 900,000 litres capacity. The height of tank above general ground level is 16 m. The bearing capacity of soil may be assumed as $150 kN/m^2$. Use M20 concrete and HYSD bars.

5. Design a circular water tank of capacity 200,000 litres. The depth of the tank is limited to 3 m from inside. The base rests on the ground.

6. Design a suitable retaining wall to retain earth for a height of 8 m above ground level. The backfill is horizontal. The density of soil is $18 kN/m^3$. Safe bearing capacity of soil is 200 kN/m^2. Take the co-efficient of friction between concrete and soil as 0.6. The angle of repose is 30°. Use M20 concrete and Fe415 steel. Design shear key, if necessary for the retaining wall.

7. Design a grid floor to cover a floor area of size 15 m × 12 m. The spacing of the ribs in mutually perpendicular direction is 2 m C/C. Live load = $2 kN/m^2$. Use M-20 concrete and Fe-415 steel. Analyze the grid floor for moments and shears by Rankine Grashoff method. Sketch the reinforcement details.

8. Design a cinema balcony. The live load may be taken as 4500N/m2 inclusive of furniture etc. The horizontal tread of each step is 1 m and rise is 120 mm. The depth of fulcrum girder is limited to 1m. Assume any other relevant data.
***

Code: 1G681

IV B.Tech. II Semester Advanced Supplementary Examinations June 2017
Design and Drawing of Irrigation Structures
(Civil Engineering)

Max. Marks: 70   Time: 3 Hours

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

1.   Following data are available for a proposed Canal Cross Regulator:

No.	Particulars	Upstream	Downstream
1	Full supply Discharge	24 Cumecs	20 Cumecs
2	Bed width	15.0 m	15.0 m
3	Bed level	+70.00	+70.00
4	Full supply level	+72.30	+72.00
5	Top bund level	+73.50	+73.00
6	Top width of bank: Right	2.0 m	2.0 m
	Left	5.0 m	5.0 m
7	Side slopes: Cutting	1:1	1:1
	Filling	1.5H: 1V	1.5H: 1V

There is a berm 1.0 m wide at G.L. on both the sides of the canal. Hydraulic gradient=1 V: 10 H, G.L at the proposed site=+ 72.00 & hard soil for foundation available at 69.00. Provide a roadway of clear with=3.50 m with 0.3 m kerb stones on either sides. Assume RCC slab of 20.00Cm thickness with a wearing coat of 10.00 Cm. Keep the bottom of RCC slab at +73.00 m.   **-25M**

Design a suitable Regulator, taking C_d =0.75

Draw to suitable scale:

   (i) Half plan at Top & Half plan at foundation   **-20M**
   (ii) U/S end view, half in section & half in section   **-15M**
   (iii) Section through the Regulator vent   **-10M**

OR

2. Design a Canal drop (Notch Type) for the following data:

No.	Particulars	Upstream	Downstream
1	Full supply discharge	10.00 Cumecs	10.00 Cumecs
2	Bed level	+20.00	+20.00
3	Full supply level	+21.50	19.50
4	Bed width	8.0 m	8.0 m
5	Top bund level	+22.5	+20.50
6	Top width of embankment	2.0 m	2.0 m
7	Side slopes: Cutting Filling	1:1 1.50 H; 1.00 V	1:1 1.50 H; 1.00 V
8	Average G.L	+20.50	+20.50
9	Hard soil for foundation available at	+18.50	
10	Half supply depth	1.0 m	
11	Specific gravity of Concrete/Masonry	2.25	
12	C_d for Notches	0.70	
13	Bligh's creep coefficient	5.0	

-25M

Draw to a suitable scale:
   (i) L-section of the drop   **-20M**
   (ii) Half plan at top & half plan at foundation   **-15M**
   (iii) D/S end view half in section & half in Elevation   **-10M**

***