

B.E. Eighth Semester (Civil Engineering) (CGS)

10240 : Professional Elective-II : Advanced Design of RCC Structures : 8 CE 04

P. Pages : 2

Time : Four Hours



AU - 2978

Max. Marks : 80

- Notes :
1. All question carry equal marks.
 2. Answer **any two** question from Section A and **any two** question from Section B.
 3. Due credit will be given to neatness and adequate dimensions.
 4. Assume suitable data wherever necessary.
 5. Illustrate your answer necessary with the help of neat sketches.
 6. Use of calculator is permitted.
 7. I.S.I. Hand book for structural Steel section, I.S. Code 1893 (2002), IS: 13920, I.S. 456 (Revised) I.S. 875 may be consulted.
 8. Use of pen Blue/Black ink/refill only for writing the answer book.

SECTION - A

1. A Reinforced concrete single bay single storey portal frame is used for covering a hall of size $8\text{m} \times 24\text{m}$. The portals are spaced at 4m intervals. The height of column is 5.5m . from top of footing provide slab thickness 125mm . Design one of the intermediate portal frame along with column. Assume fixed end condition at the base of column. Assume safe bearing capacity of the soil is 300kN/m^2 . Sketch the details of reinforcement in the Frame. 20

OR

2. a) Design a simply supported circular slab having effective diameter 7m to support a live load of 5kN/m^2 . The supporting circular beam is 300mm wide. Use M25-Concrete and Fe415 steel. Assume any other data if required. Sketch the reinforcement details. 14
- i) Bottom plan reinforcement ii) Top plan reinforcement
iii) Typical c/s.
- b) Explain briefly methods of analysis of grid floor slab. 6

3. Design a foot bridge for following data: 20
- i) Clear roadway width = $2-8\text{m}$
ii) Effective span = 14m
iii) Live load = 5kN/m^2
iv) Wearing coat thickness at centre 100mm and at the end 70mm
v) Use M25 concrete and Fe415 steel.
vi) Sketch the reinforcement details.

OR

4. Design a R.C.C. T-beam girder bridge for following data:
- i) Clear width of roadway = 7.5m
ii) Effective span = 17m
iii) Average thickness of wearing coat = 100mm
iv) IRC - class - A loading
v) Use M.25 - grade concrete and Fe 415 steel.
vi) Show the details of reinforcement.

SECTION - B

5. a) Design a square bunker to store the coal for following data.

14

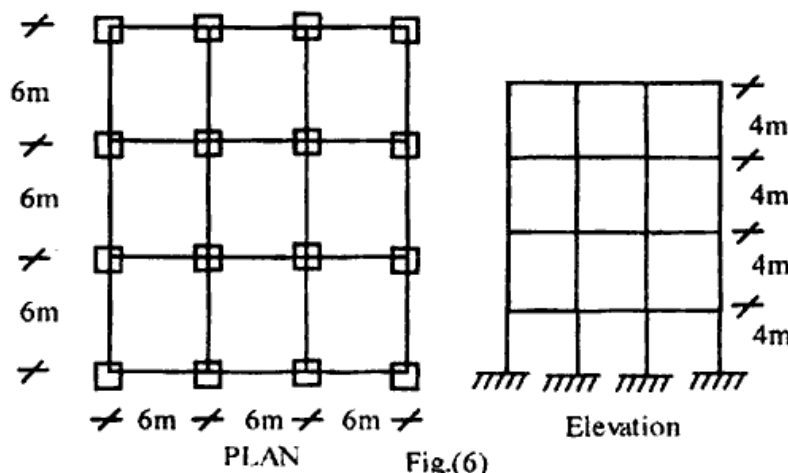
- Size = $3.0\text{m} \times 3.0\text{m} \times 3.5\text{m}$.
- Unit weight of coal = 8.34kN/m^3
- Angle of repose = 30°
- Central hole for discharge = $0.5\text{m} \times 0.5\text{m}$
- Height of hopper portion = 1.25m
- Use M-25 grad concrete and Fe415 steel.

- b) Explain briefly seismic coefficient method.

6

OR

6. A four storey (G+3) reinforced concrete hospital building has a ground plan $15\text{m} \times 15\text{m}$ and elevation as shown in fig. 6. The imposed load on roof is 1.5kN/m^2 and that on floor 4kN/m^2 . Determine the seismic load on frame by seismic coefficient method. The roof and floor slab are 125mm thick. The size of beam is $250\text{mm} \times 400\text{mm}$ and columns $400\text{mm} \times 500\text{mm}$. The height of floor is 4.0m . There is a external and internal wall of 230mm & 150mm thick Assume location in Zone - III.



7. Work out the dimensions of Intze tank for 20 Lacs litres capacity and design top dome, top ring beam, cylindrical wall of concrete and Fe-415. steel. Draw the sketches giving structural details.

20

OR

8. Design raft foundation for Intze tank of capacity of 16 lacks litres. The tank is supported on eight circular columns. Total load on circular ring girder below bottom spherical dome is $20,000\text{kN}$ wind load intensity is 1.5kN/m^2 . Height of staging above ground level is 15m . safe bearing capacity of soil is 250kN/m^2 . Use M25. grade of concrete and Fe-415 steel. Assume any other data if required. Sketch the reinforcement details.

20
