

M.Tech. Structural Engineering & Construction (CBCS Pattern) Sem-I  
**PSES12 - Advanced Concrete Structures**

P. Pages : 1

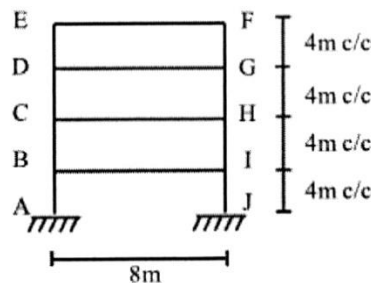
Time : Four Hours



**GUG/W/22/10962**

Max. Marks : 70

1. Analyze the building frame for earthquake load as shown in figure consider following data. **17**
- Self-weight of each floor =  $3 \text{ kN/m}^2$   
Live load on floor =  $2.5 \text{ kN/m}^2$   
Self weight of roof =  $3 \text{ kN/m}^2$   
Live load on roof =  $1.5 \text{ kN/m}^2$   
Location of building = zone III hard soil  
Height of each floor = 3.5 m  
Spacing of frame = 3.5 m  
Main beam are  $250 \times 500 \text{ mm}$  in size.  
Transvers beam are  $250 \times 400 \text{ mm}$  in size.  
Inner column are  $250 \times 650 \text{ mm}$  in size.  
Outer column are  $250 \times 450 \text{ mm}$  in size.  
Draw SFD, BMD and AFD with proper sign convention.



2. Design a circular RCC chimney of height 60 m with external diameter of shaft as 4 m where the wind intensity is  $1.5 \text{ kN/m}^2$ . The thickness of fire bricks lining is 100 mm. The temperature difference between inner and outer shaft is  $65^\circ\text{C}$ . Use M20 grade of concrete and Fe 415 grade of steel. SBC of soil is  $150 \text{ kN/m}^2$ . Draw reinforcement details. **17**
3. Design RCC Tee beam type deck bridge for IRC class AA wheeled vehicle loading. **18**
- Clear carriage width = 7.2 m  
Clear span = 8 m  
Wearing coat = 80 mm  
Kerb width = 300 mm  
Use M20 grade of concrete and Fe 415 grade of steel and draw reinforcement detail also.
4. Design square bunker  $3 \times 3 \text{ m}$  to store 25 tons of coal having  $9 \text{ kN/m}^3$  density and  $30^\circ$  angle of repose. Height of column is 5 m from level. Coefficient of friction between material is 0.45. SBC of soil is  $180 \text{ kN/m}^2$ . Use M 20 grade of concrete and Fe 415 grade of steel and draw reinforcement details of all members. **18**

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