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43(7) B.Arch 7-5

2017

**STRUCTURE-VII**

Paper : ENG-7-5

Full Marks : 100

Time : Three hours

**The figures in the margin indicate full marks for the questions.**

**Answer any five questions.**

1. (a) Compare Pre-stressed concrete with RCC beams. 10
- (b) Describe the losses of Pre-stress. 10
2. A prestressed concrete beam  $400 \times 600 \text{ mm}$  in section of  $6 \text{ m}$  and is subjected to uniformly distributed load of  $16 \text{ kN/m}$  including the self weight of the beam. The prestressing tendons are along the longitudinal centroidal axis providing an effective force of  $960 \text{ kN}$ . Determine the extreme fibre stress in concrete at the midspan section. 20

Contd.

3. What are Flat Slab ? Discuss its advantages and disadvantages of a flat slab. Write down its components and draw its reinforcement details. 3+7+10
4. (a) What are the different classification of stairs ? Explain with proper diagram. 10  
(b) Explain the classification of Pre-stressed concrete. 10
5. Design one of the flight of stairs of a school building spanning between landing beams to suit the following data :  
Tread = 300mm  
Rise = 150mm  
Type of stairs = Dog leg  
No. of steps in each flight = 12  
Width of landing beam = 400mm  
Material M20 and Fe415 HYSD bars. 20
6. Design the interior panel for a flat slab for a warehouse to suit the following data. 20  
(i) Size of the warehouse is 30m × 30m divided into panels of 5m×5m.

- (ii) Materials M-20 and Fe-415  
(iii) Loading 3kN/m.

7. Write short notes on :

- (a) Tendons  
(b) Pre-tensions  
(c) Post-tensions  
(d) Anchor  
(e) One way slab and two way slab.

20