T. Y. B.ARCH. SEM – V (2010 COURSE) : SUMMER - 2019
SUBJECT: THEORY OF STRUCTURES AND BUILDING MATERIALS-V

Day: Tuesday | Time: 10.00 AM TO 01.00 PM
Date: 07/05/2019 | Max Marks: 100

S-2019-3730

N.B.:

1) Answer any three questions from Section-**I** and all questions from Section-**II** are **COMPULSORY**.
2) Both the sections should be written in the **SEPARATE** answer books.
3) Neat diagrams must be drawn **WHEREVER** necessary.
4) Figures to the **RIGHT** indicate full marks.
5) Use of electronic calculator ant steel table is **ALLOWED**.
6) Assume suitable data, if necessary.
7) In R.C.C. Design use M-20 grade concrete and Fe 415 (Tor) grade of steel.

SECTION-I

Q.1 Write a short-note on **ANY FOUR** of the following: **(20)**

i) Rankine's theory of earth pressure.
ii) Types of staircase based on supports.
iii) Advantages of pre-stressed concrete over RCC.
iv) Trial pits
v) Foundation problems at site
vi) Steel plate girder

Q.2 a) A simply supported beam is having span of 7m and cross sections of 300 mm X 800 mm. The beam carries udl of 40kN/m (including self weight) over its entire span. If per-stressing force of 800kN is applied at an eccentricity of 300mm from the neutral axis, find maximum stresses in top and bottom fibres. **(10)**

b) Write a short note on:
i) Counterfort type Retaining wall **(10)**
ii) Elements of overhead water tank

Q.3 a) Design a simply supported dog-legged staircase for a commercial building with following data. **(16)**

i) Floor to floor height 3600 mm
ii) Rise= 150mm, tread=275 mm
iii) Width of landing =1500 mm

Staircase is supported at the outer edges of the lading, on the beams of 300mm width on either side. Draw neat reinforcement sketch. Make a schedule mentioning thickness, Cover and main and distribution steel. Use M20 grade concrete and fe415 steel.

b) Draw typical reinforcement of cantilever type retaining wall with retained earth. **(04)**

Q.4 a) Check the stability of a masonry retaining wall with following data: **(20)**

i) Height of wall=4m
ii) Top width= 1m
iii) Base width= 1.5m
iv) Angle of repose=28^0
v) Co-efficient of friction= 0.58
vi) Unit weight of masonry 19 kN/m^3
vii) Unit weight of soil 16 kN/m^3
viii) Backfill is horizontal with vertical face towards retained earth
ix) Soil Bearing Capacity 300 kN/m^3

Check for sliding, overturning, maximum and minimum pressure.

SECTION-II

Q.5	Difference between light weight concrete and ordinary concrete?	**(10)**
Q.6	Difference between damp proofing and waterproofing?	**(10)**
Q.7	What is Guniting? Explain advantages of Guniting?	**(10)**
Q.8	What are the special concretes used in building industry?	**(10)**

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