

F. Y. B.ARCH. SEM – II (2010 COURSE) : SUMMER - 2018
SUBJECT: THEORY OF STRUCTURES & BUILDING MATERIALS-II

Day: **Saturday**
Date: **05/05/2018**

S-2018-3317

Time: **10.00 AM TO 1.00 PM**
Max. Marks: 100

N.B.:

- 1) Answer **ANY THREE** Questions from **Section-I**.
- 2) All questions in **Section -II** are **COMPULSORY**.
- 3) Figures to the right indicate **FULL** marks.
- 4) Answers to both the sections should be written in **SEPARATE** answer books.

SECTION-I

- Q.1** Explain any **FOUR** with neat sketches. **(20)**
- a) Draw shear stress distribution diagram for 'C' and 'T' section.
 - b) Slope and deflection of cantilever beam.
 - c) Explain stress –strain diagram for mild steel.
 - d) What is partial safety factor? What is its necessity; give different values partial safety factors for construction materials?
 - e) Give shear stress equation and explain all terms.
- Q.2** a) A steel bar 2.5m long, 25 mm wide and 25 mm thick and it subjected to axial compressive force of 250 kN long its length. Find changing length breadth, depth and volume of bar. Take $E = 2 \times 10^5 \text{ N/mm}^2$ and $\mu = 0.3$. **(10)**
- b) A R.C.C column 230mm x 450 mm in section. The column is provided 6 bars of 16mm diameter. The column carries axial load of 350 kN. Find stresses in steel and concrete. Take $E_s = 2 \times 10^5 \text{ N/mm}^2$ and $E_c = 15 \text{ kN/mm}^2$. **(10)**
- Q.3** a) Find out maximum shear stress for a T section having flange 15cm x 3cm and web 2cm x 20cm Take. Maximum S.F as 1500 N. also. Find out average share stress. **(10)**
- b) Find out maximum bending stress for I beam having flanges 15cm x 2cm and web 40 cm x 25 cm. The beam is Simply supported of 3m span. It carries 5kg point load at centre and 4 kg/m UDL over entire span. **(10)**
- Q.4** a) Find out maximum slope and deflection for a S.S beam with UDL 17 kN/m over entire span of beam is 5m. Take $E = 15 \text{ kN/mm}^2$ and $I = 4.5 \times 10^9 \text{ mm}^4$. **(10)**
- b) Find out stresses at 4 corners of a column 300mm x 600mm (300 mm horizontal) carrying an eccentric load in 3rd quadrant at an eccentricity 70 mm along x axis and 50 mm along y axis. The magnitude eccentric load is 2500kg. **(10)**

SECTION-II

- Q.5** Attempt any **TWO** of the following: **(20)**
- a) Explain various defects in Timber.
 - b) Explain with sketches how Bamboo is used as a construction material.
- Q.6** Answer any **TWO** of the following: **(10)**
- a) Explain curing of concrete.
 - b) Slaking of Lime.
 - c) Various types of roofing materials.
- Q.7** Write short notes on any **TWO**: **(10)**
- a) Differentiate between various Roofing materials.
 - b) Cement Concrete blocks.
 - c) Explain various types of flooring materials.