

S.No. : 282

AR 1103

No. of Printed Pages : 04

Following Paper ID and Roll No. to be filled in your Answer Book.

PAPER ID : 10103

Roll
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B. Arch. Examination 2019-20

(Odd Semester)

ARCHITECTURAL STRUCTURE - I

Time : Three Hours]

[Maximum Marks : 60

Note :- Attempt all questions.

SECTION - A

1. Fill in the blanks : 8×1=8

(a) Modulus of elasticity is the ratio of

(b) Unit of measurement for section modulus is

(c) The moment of inertia of a circular section of diameter (d) is given by relation

(d) At neutral axis, bending stress is

(e) At neutral axis, shear stress is

[P. T. O.

- (f) Section modulus for rectangular lamina of $(b \times d)$ mm² is
- (g) Maximum shear stress occurred in rectangular lamina is times its average shear stress.
- (h) The point of contra flexure occurs where

SECTION - B

2. Attempt any three parts of the following: $4 \times 3 = 12$
- (a) State methods of finding centre of gravity, Hookis law and define section modulus.
- (b) Define shear centre and state principal of transmissibility and principal of superposition.
- (c) What are principal stresses and strains? State law of parallelogram of forces.
- (d) What are different types of beams, different types of support and loading conditions?

SECTION - C

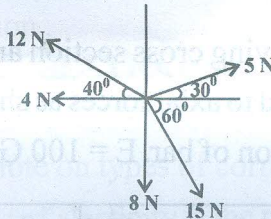
Note :- Attempt any two questions of following :

$$20 \times 2 = 40$$

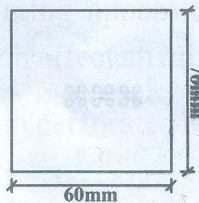
3. (a) A circular beam of 100 mm dia is subjected to a shear force of 30 kN. Calculate the value of maximum shear stress and sketch the variation of shear stress along the depth of the beam.

OR

- (b) Determine the resultant and direction of the following force system :



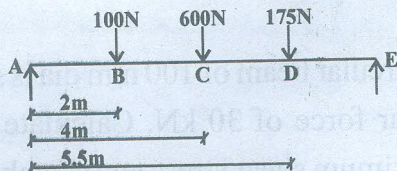
4. (a) Find centre of gravity and moment of inertia (I_{xx} and I_{yy}) :



OR

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- (b) Draw SFD and BMD and determine support reactions of the following beam of total length 7 m :



5. (a) A square steel rod $20 \text{ mm} \times 20 \text{ mm}$ in section is to carry an axial load (compressive) of 100 kN. Calculate the shortening in a length of 50 mm. $E = 2.14 \times 10^8 \text{ kN/m}^2$.

OR

- (b) A bar having cross section area of 1000 mm^2 is subjected to axial forces as shown. Find the total elongation of bar. $E = 100 \text{ GN/m}^2$:

