

[5257]-1002

F.Y. B.Arch.

THEORY OF STRUCTURE - I
(2015 Pattern)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Q.1 from section I and Q.5. from section 2 has to be compulsory.
- 2) Any two question out of Q. 2/3/4 to be attempted from section I.
- 3) Any two question out of Q. 6/7/8 to be attempted from section II
- 4) Use of scientific calculator is allowed.

SECTION - I

- Q1)** A beam as shown in fig.1. Calculate a) support reaction b) shear force dia. With position of zero shear c) bending moment dia. With point of contraflexure. [15]

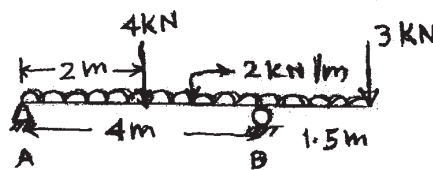


Fig.1.

- Q2)** a) An electric light fixture weighing 15 N hangs from point C, by two strings AC & BC. AC is inclined at 60° to the Horizontal & BC at 45° to the vertical as shown in Fig.2. Using Lami's theorem determine the forces in the strings AC & BC. [7]

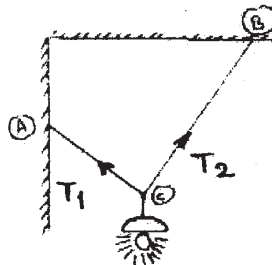


Fig.2.

- b) Define support. Explain hinged & roller support with respect to reaction they offer. [3]

P.T.O.

- Q3)** a) Find the centroid of the 'T' section as shown in fig 3. [6]

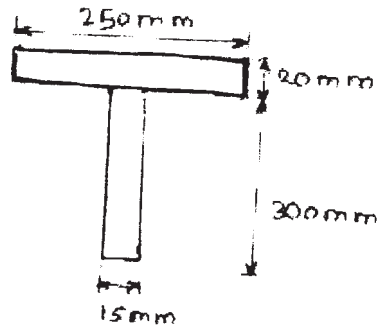


Fig.3.

- b) Draw a right angled triangle & semi-circle and show their center of gravity about X-X, Y-Y axis. [4]

Q4) Solve any two :

- a) State and explain Law of parallelogram theorem. [5]
- b) i) Draw and explain concurrent & non-current force system. [3]
- ii) Explain resolution of force. [2]
- c) State & explain the principle of superposition of force & principle of transmissibility of force. [5]

SECTION - II

- Q5)** Find centroide. And Calculate moment of inertia for a given section Fig.4 about its cenetroidal X-X & Y-Y axis. [15]

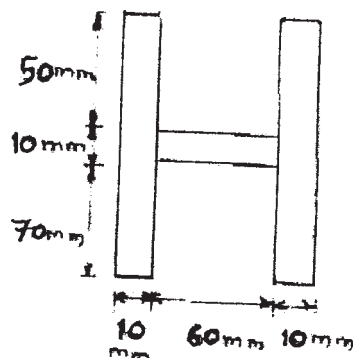


Fig.4.

Q6) a) Find support reaction for beam given in fig. 5. [7]

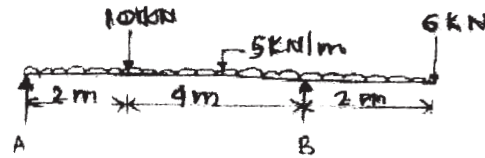


Fig.5

b) Explain point load, UDL & uniformly varying load. [3]

Q7) a) Find the resultant of the following system of forces as shown in fig.6. [6]

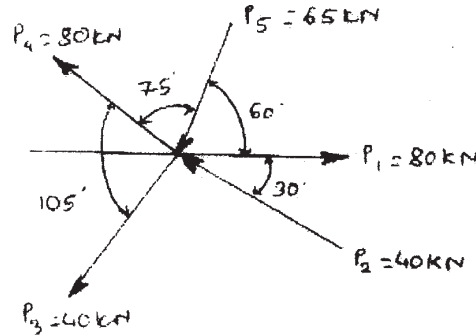
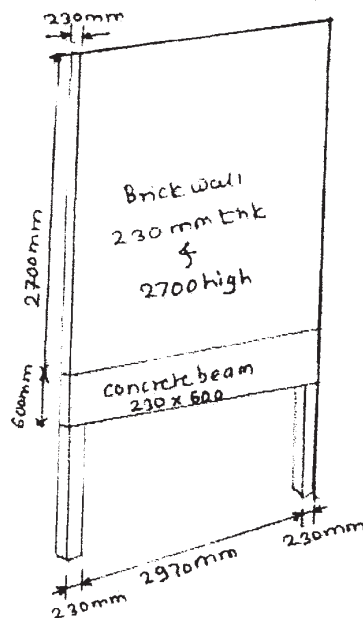


Fig.6

b) What is statically determinate and indeterminate structure. Explain the term degree of indeterminacy giving example of a fixed beam. [4]

Q8) a) Find the Support Reactions for the beam given Below. [6]



b) Explain a Simple, Fixed, Hinged and Roller Support with the help of reactions they offer. [4]

