Total No. of Questions : 8]

SEAT No. :

P1330

[Total No. of Pages : 3

[5157] -1002
F. Y. B. Arch.
THEORY OF STRUCTURES -I
(2015 Pattern)

Time : 3 Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Q. nos.1 & 5 are compulsory.***
2) ***Solve any 2 questions out of the remaining 3 from each section. Total solve 3 questions from each section.***
3) ***Figures to the right indicte full marks.***
4) ***Assume suitable data wherever required. Mention the assumption.***
5) ***Use of Non-programmable Scientific calculator is allowed.***

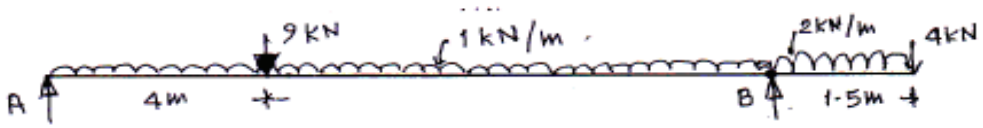
SECTION -I

Q1) For the beam shown in figure below

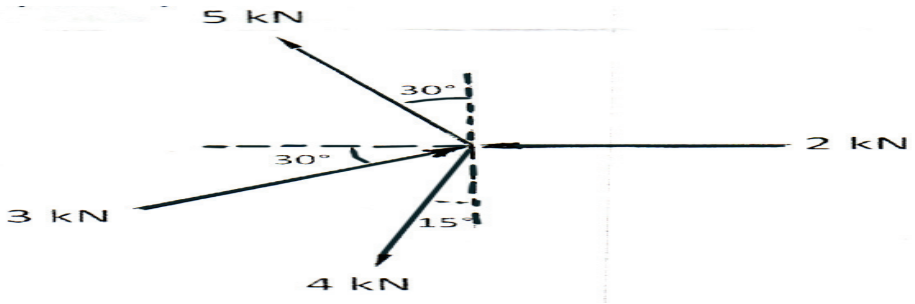
i) Determine reactions at supports **[3]**

ii) Draw the shear force diagram **[6]**

iii) Draw the Bending moment diagram **[6]**



Q2) a) For the concurrent forces shown in figure below, find out the resultant in magnitude & direction, analytically or graphically. **[7]**



b) State the conditions of equilibrium of a system of concurrent or non-concurrent forces. **[3]**

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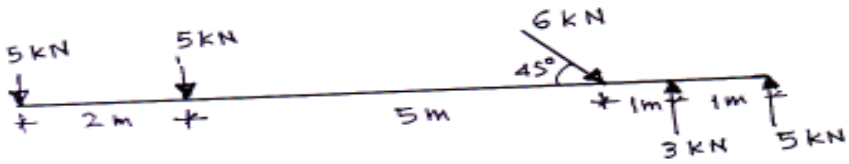
Q3) a) For the non-concurrent forces shown in figure below, find out the resultant in magnitude, direction and position. **[7]**



b) Explain with sketches, Principle of transmissibility of forces. **[3]**

Q4) a) Explain with sketches, Parallel and concurrent forces. **[4]**

b) Explain with sketches, Law of polygon of forces. **[4]**

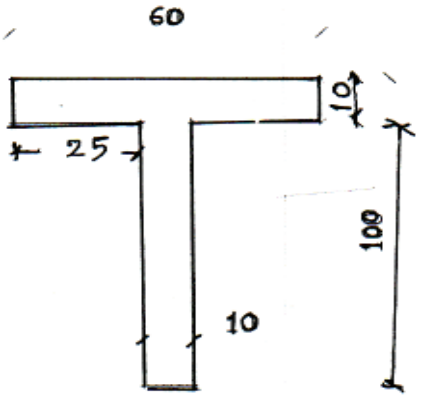
c) Explain with sketches, Moment of a force. **[2]**

SECTION -II

Q5) For the section as shown in figure below

a) Determine the position of C.G. of the section **[6]**

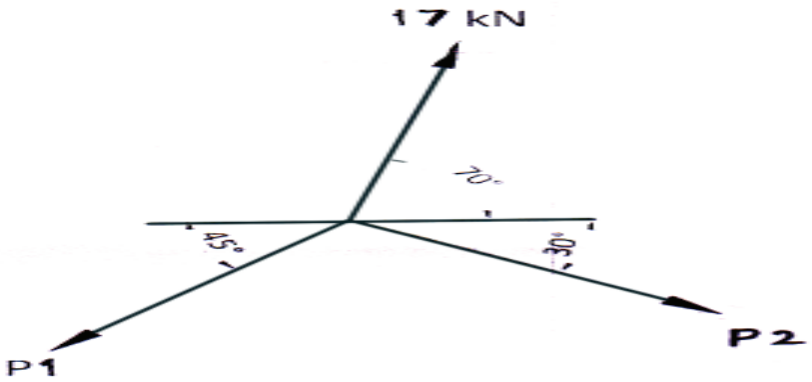
b) Determine the M.I. of the section along both axes passing through its C.G. **[9]**



Q6) a) For the RCC beam of 0.3×0.7×6 M, supporting a wall of 0.23 m thick and height of 3.6 m. find reactions. Take density of concrete = 25 kN/m^3 and density of brickwork =19kN/m^3 **[7]**

b) Define support. Explain with sketches, the difference between hinged and fixed support. **[3]**

Q7) a) If the forces as shown in figure below, are in equilibrium, determine the unknown force P1, P2 **[6]**



b) Define Resultant of a force and Equilibrant force. **[2]**

c) Define Couple. Give examples. **[2]**

Q8) a) What are statically determinate and indeterminate structures? Define degree of indeterminacy with an example of a fixed beam. **[4]**

b) Draw a typical simply supported beam with UDL over the entire span. Draw its SFD & BMD. Mention & show max. values in the diagrams. **[6]**

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