[4862]-2

First Year B. Arch.
THEORY OF STRUCTURE - I
(2015 Pattern) (Semester pattern)

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

Instructions to the candidates:

1) *Question No:1 is compulsory.*

2) *From remaining solve **any four** questions.*

3) *Use of scientific calculator is allowed.*

4) *Draw sketches wherever required.*

5) *Figures to the right indicates full marks.*

Q1) a) Draw shear force and bending moment diagram for a simply supported beam of span 'l' m with a UDL of w kN/m over entire span. **[5]**

b) A beam as shown in fig (1) calculate

     i) Support Reactions. **[4]**

     ii) Shear force diagram. **[6]**
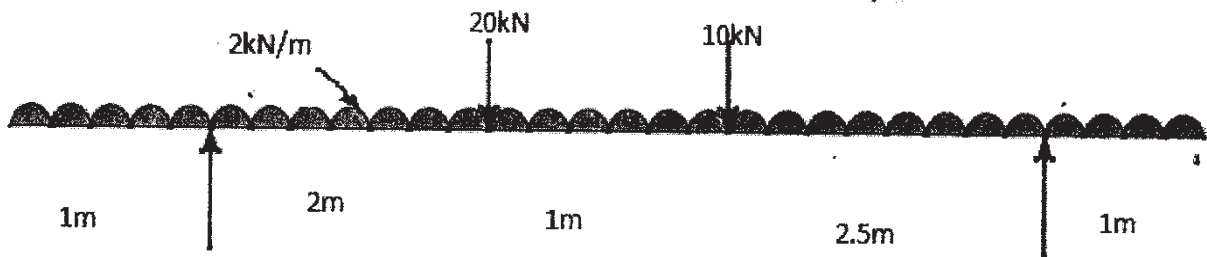
     iii) Bending moment diagram. **[7]**

Fig No. (1)

P.T.O.

Q2) a) Calculate moment of Inertia for given section fig (2) about its centroidal X - X and Y - Y axis. **[10]**
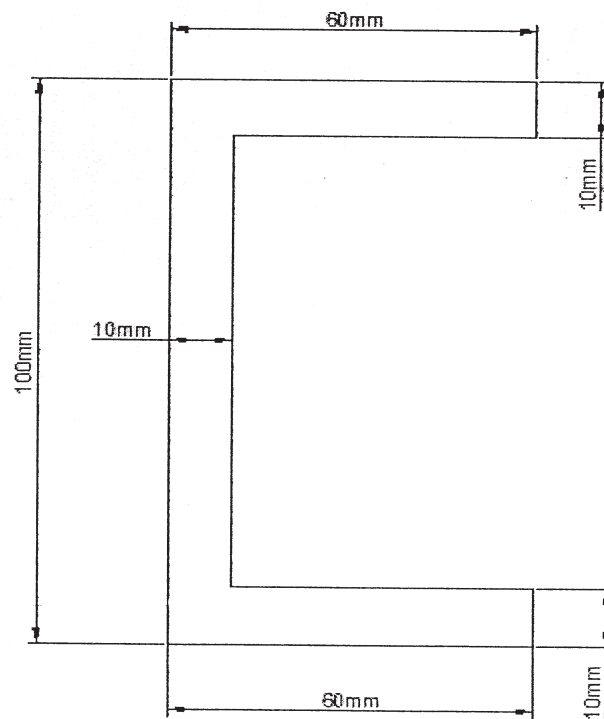
b) Define moment of force. **[2]**

Fig No (2)

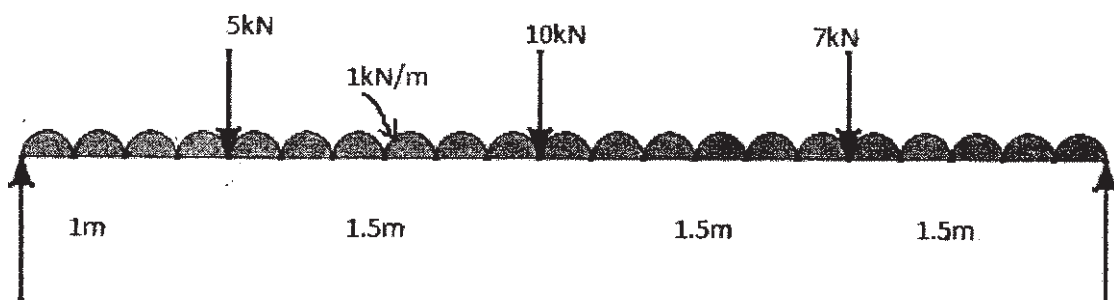*Q3)* a) Find support reaction for beam given in fig No (3). **[6]**

Fig No 3

b) Explain parallel axis theorem and perpendicular axis theorem. **[6]**

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Q4) a) A wall as shown in <u>fig no (4)</u> rests on a beam of mentioned cross-sectional dimensions. Calculate the total uniformly distributed load (UDL) acting on beam and also find support reactions for beam if density of brick masonary wall is 19 kN/m³ and density of R.C.C. is 25 kN/m³ **[7]**
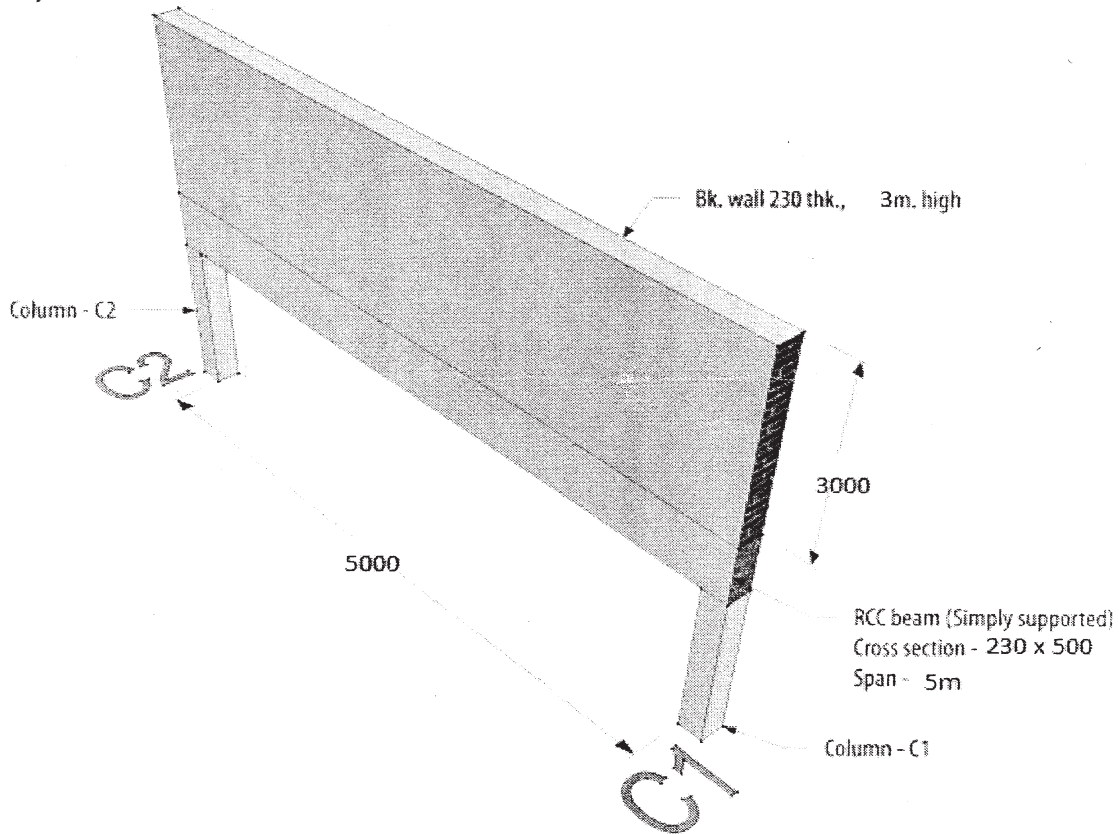

Bk. wall 230 thk., 3m. high

Column - C2

C2

3000

5000

RCC beam (Simply supported)
Cross section - 230 x 500
Span - 5m

Column - C1

C1

Fig No: 4

b) What is force? State characteristics and effects of forces. **[5]**

Q5) a) Two forces of magnitude 100 N and 80 N act away from each other at an angle of 60°. Calculate resultant in magnitude and direction. **[7]**

b) What are parallel forces? Explain Varignon's theorem. **[5]**

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Q6) a) Calculate resultant in magnitude and direction for given concurrent force system analytically or graphically.(fig No.:5) **[8]**
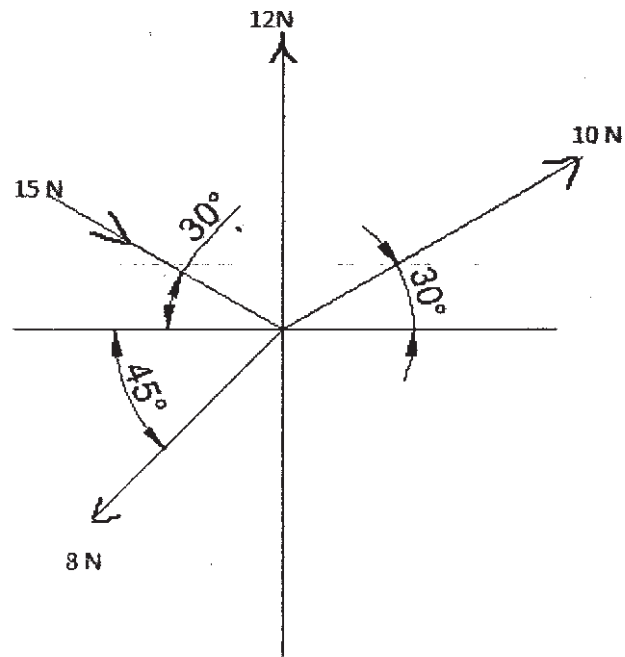

Fig No. 5

b) Write moment of inertia formulae for

i) Rectangle. ii) Circle. **[4]**

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