P1565

[4962] - 1001
F.Y. B.Arch.
BUILDING TECHNOLOGY & MATERIALS - I
(2015 Pattern) (Semester - I)

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

Instructions to the candidates :-

1) *Answers to Section I, to be given on drawing sheets only.*

2) *Answers to Section II to be given on answer sheets only.*

3) *All questions are compulsory.*

4) *Draw neat sketches wherever necessary.*

5) *Figures to the right of each question indicate full marks.*

6) *Assume suitable data wherever necessary.*

SECTION - I

Q1) a) Draw at scale of 1:10; plan, section, elevation of "Squared Rubble Masonary" Stop end wall of height 1.2 meters, length 2.5 meters and depth of foundation 0.6 meters. **[20]**

OR

b) Draw at scale of 1:10 - plans section. Elevation of 350 thick stop end wall in double flemish bond of height up to 10 courses length 1.8 meters and depth of foundation 0.6 meters.

Q2) Draw neat sketches (Any three) (on drawing sheet only) **[15]**

a) Draw plans of foundation of 350 thick detached pier up to three courses.

b) Draw neat sketch of segmental arch showing its components.

c) Draw neat sketch of , alternate courses of "Cross" - junction in 230 thick brick wall.

d) Draw neat sketch of cross section of internal wall.

e) Draw neat sketches of Any three tools used for excavation.

P.T.O.

Q3) Explain in detail with sketches (Any two) [20]

    a)   What is coping? Draw sketches of four types of coping.

    b)   Plan of alternate courses of Attached pier in

        i)   Wall of one brick thick (230 thick)

        ii)   Wall of one and half brick thick (350 thick) in english bond.

    c)   Explain with sketches Earthquake resistance measures for Load bearing construction.

Q4) Write short notes on (Any three) [15]

    a)   Advantages of brick as construction material.

    b)   Classification of rocks.

    c)   Different types of soil.

    d)   Qualities of good stone.

    e)   Three types of stone dressing.

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[4962] - 1002

F.Y. B.Arch (Semester - I)
THEORY OF STRUCTURES - I
(2015 Pattern)

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

*Instructions to the candidates :-*

1) *Que. 1 is compulsory.*
2) *Attempt any four out of Q.2, 3, 4, 5, 6.*
3) *Use of scientific calculator is allowed.*
4) *Numbers to the right indicate full marks.*
5) *Draw neat sketches wherever required.*

Q1) a) A cantilever beam having length l is subjected to uniformly distributed load 'w' over the entire length. Show support reactions and draw shear force and bending moment diagram for the same. **[5]**

b) Draw shear force and bending moment diagram for the beam shown. Find maximum bending moment for the same. (Fig - 1) **[17]**

Fig - 1
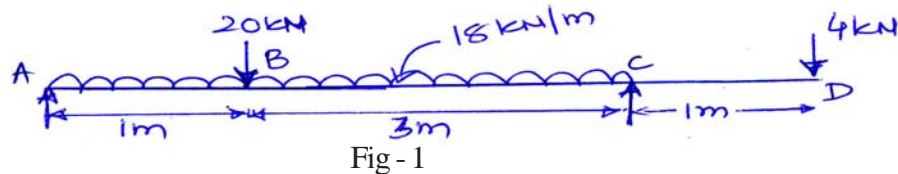
Q2) a) Find moment of Inertia for the given sections with respect to axis a - a and b - b (Fig - 2) **[6]**

Fig.2
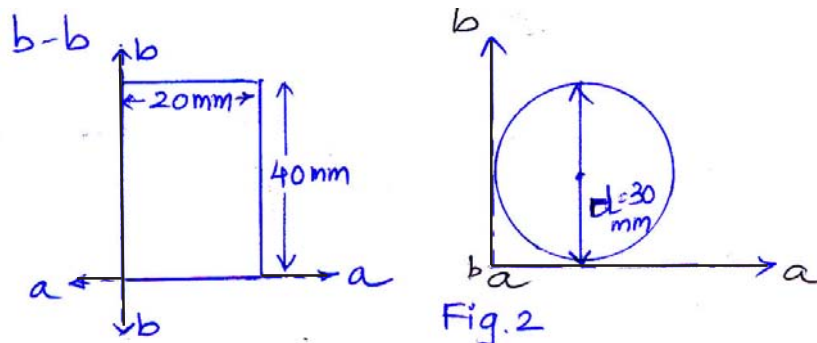
b)   Find resultant of the given force system analytically. Also find the equilibrant force for given force system.(Fig - 3)   **[6]**

Fig - 3
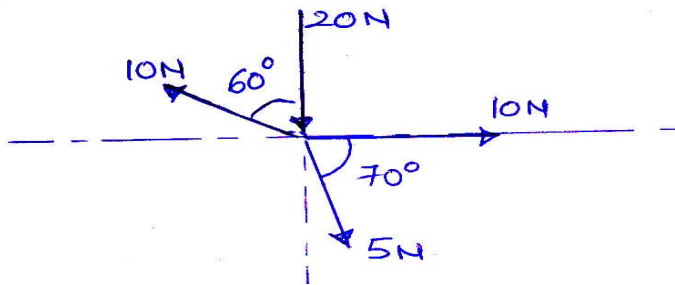
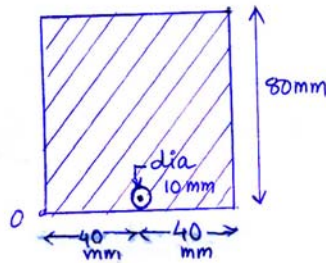**Q3)** a)   Find centre of gravity for the given lamina with respect to point 'o'.   **[6]**

Fig - 4

a)   Explain with a diagram   **[6]**

i)   Cantilever beam

ii)   Overhang beam

Q4) a)   State and explain parallel axis theorem.   **[4]**

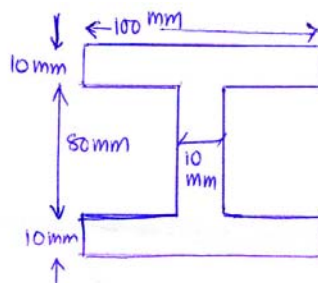b)   Find moment of inertia of the given section with respect to its centroidal X-X and Y-Y axis. (Fig 5).   **[8]**

Fig - 5

Q5) a) Find the loads acting on given beam, where unit weight of brick (density) is 18 KN/m³, and unit weight (density) of R.C.C. is 25 KN/m³. Also find reactions for the same.(Fig 6) **[6]**
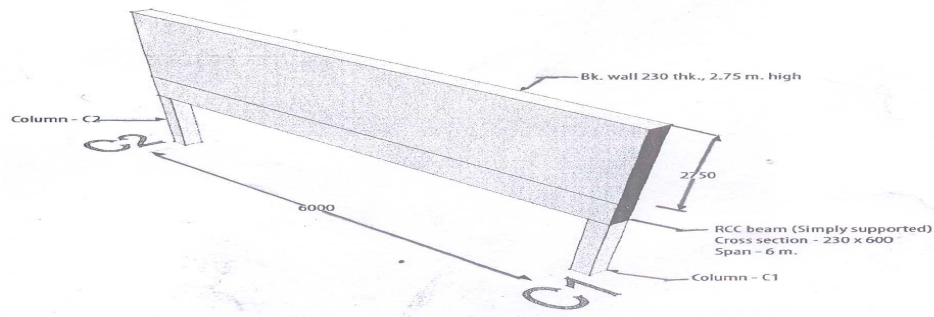
Fig - 6

b) Explain the following :- **[6]**

i) Conditions of equilibrium for coplanar nonconcurrent force system.

ii) Lami's theorem.

Q6) a) What is shear force diagram? What is point of contra-shear? Explain the importance of point of contra-shear. **[6]**

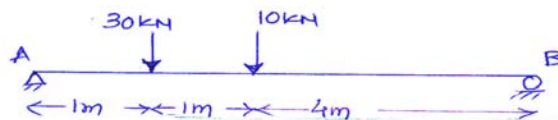b) Find reactions at support 'A' and 'B' the given beam. (Fig - 7) **[6]**

Fig - 7

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[4962] - 2001
F.Y.B. (Arch)
BUILDING TECHNOLOGY & MATERIALS - II
(2015 Pattern) (Semester - II)

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

Instructions to the candidates :-
1) *Answers to Section I should be given on drawing sheets only.*
2) *Answers to Section II should be given on answer sheets only.*
3) *All questions are compulsory.*
4) *Draw neat sketches wherever necessary.*
5) *Figures to the right of each question indicate full marks.*
6) *Assume suitable data wherever necessary.*

SECTION - I

Q1) a) Draw plan elevation and section through a casement window of size 1.80 m × 1.20 m at 1:10 and details at 1:5.   **[20]**

OR

b) A room of size 5.0m × 9.0 internal dimension needs a king post truss roofing. Draw key plan at 1:100 and elevation and details of king post truss at 1:20 and 1:10 respectively

Q2) Draw neat sketches on drawing sheets (any three)   **[15]**

a) Section through closed Couple roof.

b) Any three types of joints in floor boards.

c) Section showing details through three consecutive treads and liser giving nomenclature.

d) Joinery details between lock tail and style with wooden panel.

e) Sketches showing different types of reinforcement used in 350 mm thick brick masonary wall.

P.T.O.

SECTION - II

Q3) Answer <u>any two</u> of following. [20]

    a) Fixing details of ridge and caves sides of a Manglore tile roofing.

    b) Explain with sketches lean to roof.

    c) Any four carpentary tools with sketch and their uses.

Q4) Write short notes on (any three) [15]

    a) Different types of reinforcement in brick piers

    b) Different types of hardware fillings used in doors and windows.(any three)

    c) Block boards.

    d) Brick vaults.

    e) Two types of strutting in floors.

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[4962]-2002
F.Y.B.Arch (Semester - II)
THEORY OF STRUCTURES - II
(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 indicate full marks.*

    4)   *Assume suitable data wherever required. Mention the assumption.*

    5)   *Use of Non-programmable Scientific calculator is allowed.*

SECTION - I

Q1) a)   For the truss given in figure below, determine the forces in magnitude & type (tension or compression) in the members, AC, AH, CH, CD & CJ. Use appropriate method for analyzing.   **[12]**
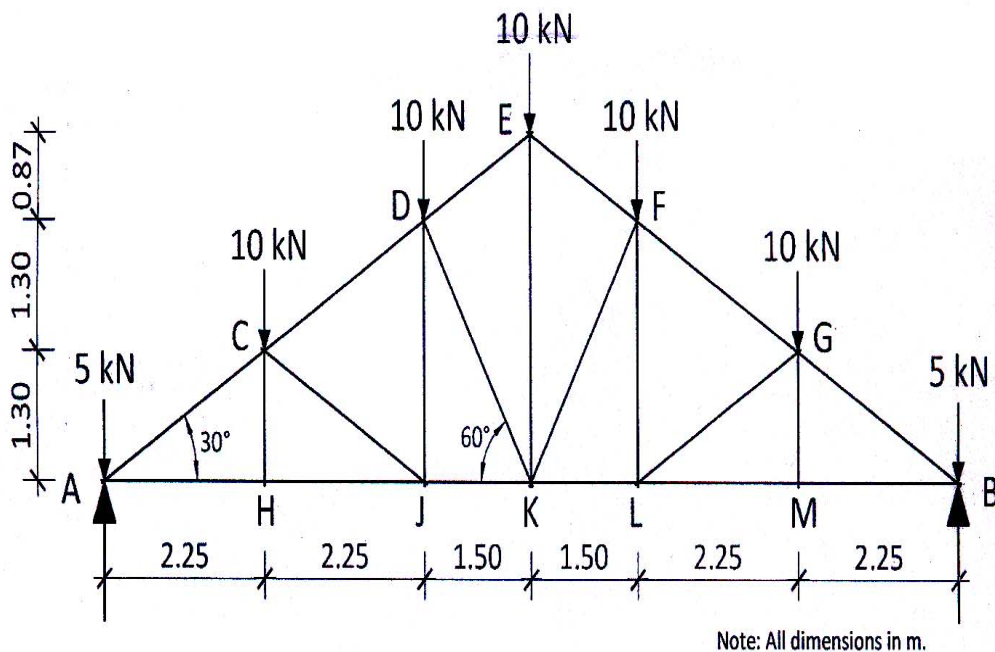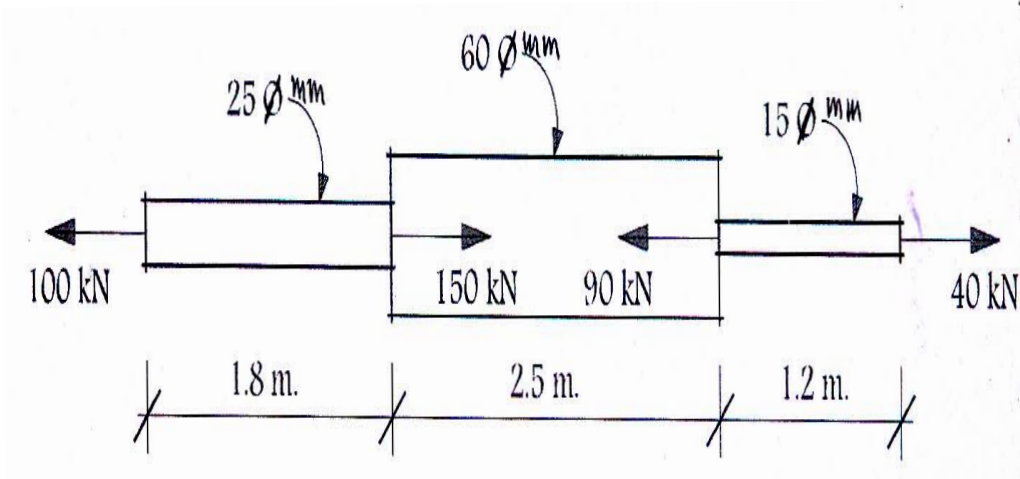

Note: All dimensions in m.

     b)   Write 3 assumptions for analysis of perfect frames.   **[3]**

Q2) a) For the member, as per figure below, **[7]**

      i) Calculate stresses in each part of the member.

      ii) Calculate total change in length. Take E= 2×10^5 N/mm²

    b) Explain with examples, elastic, plastic and brittle materials. **[3]**

Q3) a) State the assumptions of theory of simple bending. **[4]**

    b) A simply supported beam of cross section 230×450 carries an UDL of 6 kN/m over the entire span of 5 m. It also carries a central point load of 10 kN. Calculate maximum bending stress in compression and tension and sketch the bending stress diagram. **[6]**

Q4) a) Compare with sketch, the bending stress diagram and shear stress diagram of a rectangular cross section. Mention key values. **[4]**
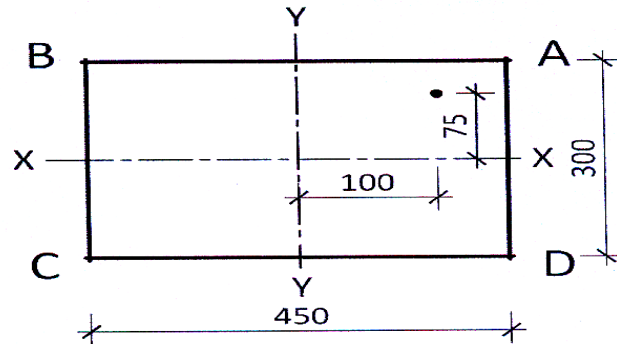
    b) Define with units **[4]**

      i) Modulus of elasticity

      ii) Poisson's ratio

    c) Define Yield stress & Permissible stress. **[2]**

SECTION - II

Q5) a) A column carries an eccentric load of 600 kN with eccentricities shown as per figure below. Calculate stresses at all corners of the column. Also sketch the stress diagram. **[12]**

Note : All dimensions in mm.

b) Explain with sketch, the Middle Third rule. **[3]**

Q6) a) Sketch a typical cantilever beam with UDL (w) over the entire span. Write the equations for maximum slope and deflection. **[3]**

b) A simply supported beam of cross section 230×600 carries an UDL of 8 kN/m over the entire span of 6 m. Calculate maximum deflection only. Take $E = 0.15 \times 10^5$ N/mm² **[7]**

Q7) a) A simply supported beam of cross section 230 x 450 carries an UDL of 7 kN/m over the entire span of 5 m. It also carries a central point load of 9 kN. Calculate maximum shear stress and sketch the shear stress diagram. **[6]**

b) Sketch proportionately, typical shear stress diagrams for a T, L & I section. Show max. values. **[4]**

Q8) a) Explain with sketches, perfect frame, deficient frame and redundant frame. **[6]**

b) Explain with sketches, how is Middle third rule applied in eccentrically loaded foundations. **[4]**

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