No. of Printed Pages : 6   **BAR-014**

BACHELOR OF ARCHITECTURE

00801

Term-End Examination

June, 2010

BAR-014 : THEORY OF STRUCTURES – II

Time : 3 hours   *Maximum Marks : 70*

Note :   (i)   *Question **No.1** is **compulsory**.*

(ii)   *Answer **any four** questions from the remaining questions.*

(iii)   *Use of calculator is **permitted**.*

1.   Choose the most appropriate answer from the options given for questions (a) to (g) :   7x2=14

(a)   Structural systems should have :

(i)   only roller supports

(ii)   maximum brittleness

(iii)   strength

(iv)   none of the above

(b)   A standing tree is considered as :

(i)   Cantilever beam

(ii)   simply supported beam

(iii)   fixed beam

(iv)   propped cantilever beam

(c) A dome is a three dimensional representation of :

    (i) a beam

    (ii) a column

    (iii) an arch

    (iv) a cantilever

(d) In members of a pin jointed truss :

    (i) no tension is present

    (ii) no compression is present

    (iii) no tension, compression or shear force is present

    (iv) no bending moment is present

(e) The point where the mass of an object is located is called as :

    (i) axis

    (ii) point of mass

    (iii) centre of gravity

    (iv) mass point

(f) Concurrent forces :

    (i) are in the same plane necessarily

    (ii) are forces passing through a point

    (iii) may or may not be in the same plane but they do not pass through a point

    (iv) are not forces but moments

(g) Centre of gravity of right circular solid cone lies on the vertical axis at a distance of :

(i) $\dfrac{h}{4}$

(ii) $\dfrac{h}{3}$

(iii) $\dfrac{h}{2}$

(iv) $\dfrac{2\,h}{3}$

from the base of the cone where h is the height of the cone.

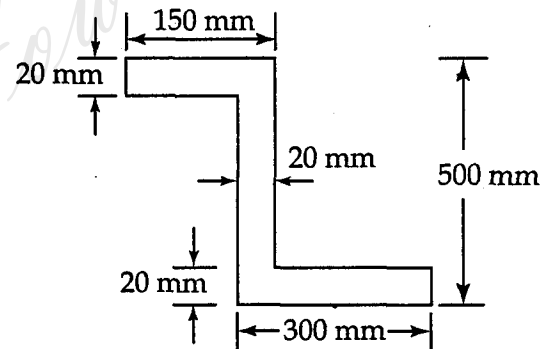2. Determine the position of the centroid of an unsymmetrical Z-section shown in Figure - 1.　　**14**

Figure - 1

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3. Find the moment of inertia about x-x and y-y **14** centroidal axes for an unequal angle section shown in Figure 2.
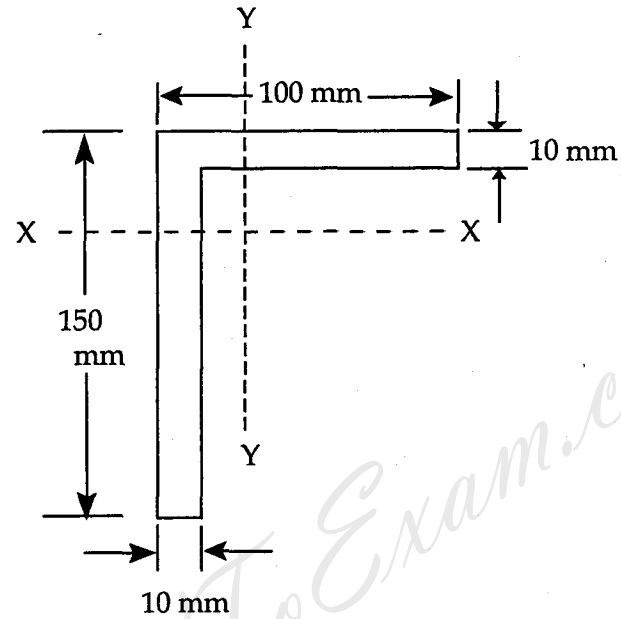

Figure - 2

4. Describe the following structural systems in brief :

(a) Arches   **4x3½=14**

(b) Post-and lintel

(c) Bearing wall

(d) Rigid frames

5. (a) Draw stress-strain curve for mild steel.   **7**
      Discuss the salient features of this curve.

(b) Differentiate between the following two   **7**
material properties with suitable examples :

    (i)   Ductility

    (ii)   Brittleness

6.   (a)   A circular rod of 12 mm diameter was tested   **7**
for tension.   The total elongation on a 300
mm length was 0.22 mm under a tensile
load of 17 KN. Find the value of Young's
modulus of elasticity of the material.

     (b)   Find the resultant for the concurrent   **7**
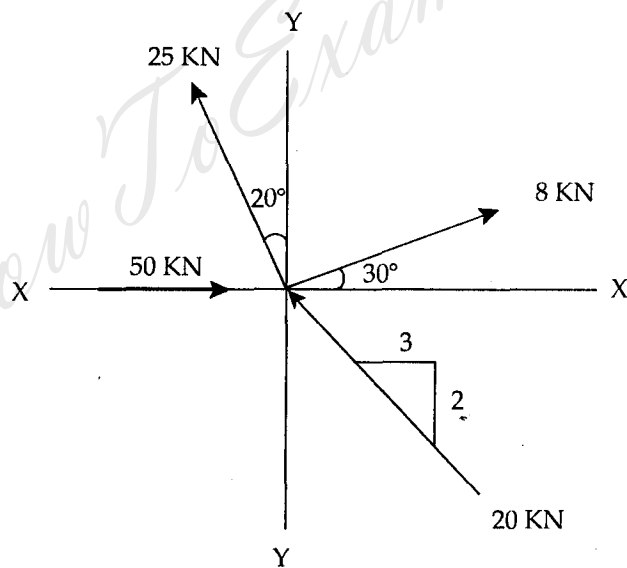coplanar force system shown in Figure 3.

Figure - 3

7. Write short notes on *any two* of the following : **2x7=14**

   (a) Funicular polygon graphical method for finding resultant of a force system.

   (b) Assumptions in strength of materials.

   (c) Use of centre of gravity and moment of inertia of a body in structural systems.

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