C.U.SHAH UNIVERSITY
Winter Examination-2015

Subject Name : Basics of Civil & Structural Engineering
Subject Code : 4TE02BCS1   **Branch :** B. Tech. (All)

Semester : 2   **Date** : 24/11/2015   **Time :**10:30 To 01:30   **Marks :**70
Instructions:
    (1) Use of Programmable calculator & any other electronic instrument is prohibited.
    (2) Instructions written on main answer book are strictly to be obeyed.
    (3) Draw neat diagrams and figures (if necessary) at right places.
    (4) Assume suitable data if needed.

Q-1   **Attempt the following questions:**   **(14)**

  a) The main principal of surveying is to work from   01
      (A) Part to the whole   (B) Whole to the part
      (C) Higher to lower level   (D) Lower level to higher level

  b) Surveys which are carried out to depict mountains, valleys, rivers, forests and other   01
      details of a country are known as
      (A) Cadastral surveys   (B) Engineering surveys
      (C) Mine surveys   (D) Topographical surveys

  c) Which of the following scale is smallest one   01
      (A) 1cm = 5 m   (B) R.F. = 1 / 5000   (C) 1:10,000   (D) 1cm = 5 km

  d) The curvature of earth is considered in   01
      (A) Plane surveying   (B) Geodetic surveying
      (C) Hydrographic survey   (D) Arial survey

  e) The triangle is said to be well conditioned when its angle should lie between   01
      (A) 30° to 120°   (B) 30° to 150°   (C) 30° to 180°   (D) 15° to 115°

  f) In the WCB system, a line is said to be free from local attraction if the difference   01
      between the FB and BB is
      (A) 0°   (B) 90°   (C) 180°   (D) 360°

  g) The line joining points of equal elevation (RL) is known as a   01
      (A) Horizontal line   (B) Gradient line   (C) Contour line(D) Level line

  h) Which of the following is a scalar quantity?   01
      (A) energy   (B) momentum   (C) torque   (D) impulse

  i) The resultant of two forces P and Q is R. If Q is doubled, the new resultant is   01
      perpendicular to P. Then,
      (A) P = R   (B) Q = R   (C) P = Q   (D) None of the above is correct

  j) If the resultant of two forces has the same magnitude as either of the force, then the   01
      angle between the two forces is
      (A) 30°   (B) 45°   (C) 60°   (D) 120°

  k) The product of Young's modulus (E) and moment of inertia (I) is known as   01
      (A) modulus of rigidity   (B) bulk modulus
      (C) flexural rigidity   (D) torsional rigidity

l) The moment of inertia of a sphere of mass m and radius r, about an axis tangential to it, is   01
(A) $2mr^2/3$ (A) $2mr^2/5$ (A) $7mr^2/3$ (A) $7mr^2/5$

m) The unit of moment of inertia of an area is   01
(A) $kg.m^2$ (B) $kg.m.s^2$ (C) kg/m^2 (D) m^4

n) The center of gravity of a semi circle lies at a distance of ….. from its base measured along the vertical radius.   01
(A) $3r/8$ (B) $4r/3\pi$ (C) $8r/3$ (D) $3r/4\pi$

Attempt any four questions from Q-2 to Q-8

Q-2   **Attempt all questions**   **(14)**

(a) Explain briefly the instruments used in chain surveying.   05

(b) Explain primary divisions of surveying.   05

(c) What are the objects and uses of surveying?   04

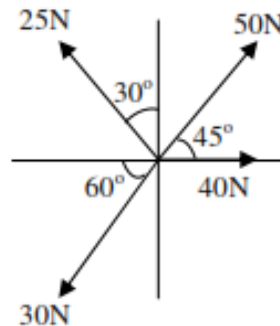**Q-3**   **Attempt all questions**   **(14)**

(a) Explain with sketch functional segments of Global Positioning System (GPS).   05

(b) Discuss various characteristics of contour with the help of neat sketches?   05

(c) Explain the application of remote sensing.   04

Q-4   **Attempt all questions**   **(14)**

(a) Enlist types of scale. Describe plane scale and draw a plane scale of 1 cm = 2m.   07

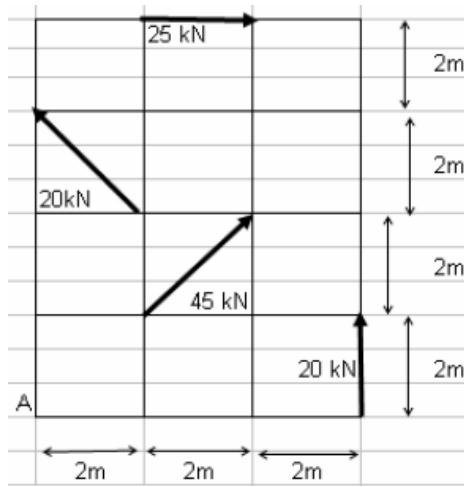(b) What is local attraction in compass? How you can predict the same?   07

Q-5   **Attempt all questions**   **(14)**

(a) Determine magnitude and direction of resultant force of the force system shown in figure.   07

(b) Determine the magnitude direction and position of resultant force of the force system given in figure with reference to point A.   07
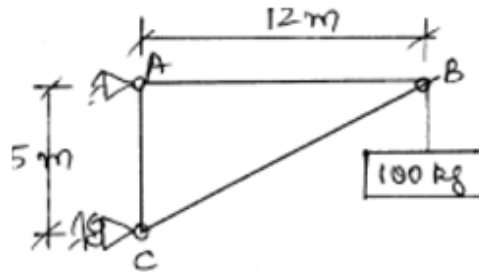
Q-6   **Attempt all questions**   **(14)**

(a)   Explain different type of force system with suitable example and sketch.   07

(b)   Write assumptions made in the analysis of plane truss. Distinguish between perfect,   07
      unstable and redundant trusses. Illustrate with sketches.

Q-7   **Attempt all questions**   **(14)**

(a)   Determine forces in member AB, BC and AC of a truss shown in figure using   07
      Method of Joints.

(b)   Determine moment of inertia of a section shown in figure about horizontal   07
      centroidal axis.
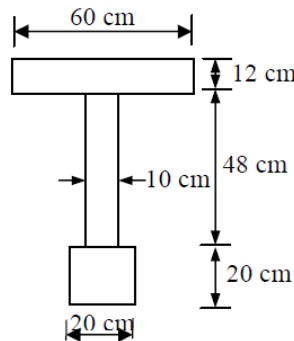
Q-8   **Attempt all questions**   **(14)**

(a)   Define the following terms used in compass survey: 05
      (i) Magnetic bearing, (ii) Whole circle bearing, (iii) Quadrantal bearing, (iv)
      Magnetic declination, (v) True meridian.

(b)   What is seasoning of timber? Why is it required? State various methods of   05
      seasoning.

(c)   What is cement? What are its ingredients?   04