Registration No :

Total Number of Pages : 03 **B.Tech**

PBC1B102

1st Semester Back Examination 2018-19

BASICS OF CIVIL ENGINEERING

BRANCH : AEIE, AERO, AUTO, BIOMED, BIOTECH, CHEM, CIVIL, CSE, ECE, EEE, EIE, ELECTRICAL, ENV, ETC, FAT, IEE, IT, MANUFAC, MANUTECH, MECH, METTA, MINERAL, MINING, MME, PE, PLASTIC, PT, TEXTILE

Time : 3 Hours

Max Marks : 100

Q.CODE : E810

Answer Question No.1 (Part-1) which is compulsory, any eight from Part-II and any two from Part-III.

The figures in the right hand margin indicate marks.

Part- I

Q1 **Short Answer Type Questions (Answer All-10)** **(2 x 10)**

a) Explain free body diagram with an example.
b) How D' Alemberts principle differs from Newton's law.
c) Define the term 'coefficient of restitution'. What is its value for a plastic collision?
d) Using Pappus theorem, compute the volume of a hemisphere of radius R.
e) The magnetic bearing of a line is $48^0 24'$. Calculate the true bearing if the magnetic declination is $5^0 38'$ east.
f) What are the criteria for transporting and placing concrete?
g) Briefly explain different types of cement.
h) What are the main functions of doors and windows in a building?
i) How the foundations classified according to their depth?
j) Differentiate direct and indirect ranging.

Part- II

Q2 **Focused-Short Answer Type Questions- (Answer Any Eight out of Twelve)** **(6 x 8)**

a) Four Forces 30 KN, 40 KN, 50 KN and 60 KN are concurrent at O(1, 2, 3) and are directed through M(6, 3, -2), N(-4,-2,5), P(-3,2,4) and Q(4, -3, 6) respectively. Determine the resultant of the system.
b) A traffic signal of mass 50 kg is hung at C with the help of two strings as shown in Fig. A. Find the forces induced in the strings.

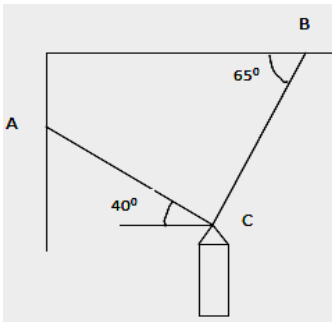

Fig. A

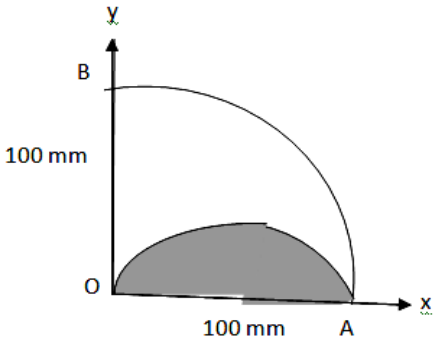

Fig. B

c) Determine the location of centroid of the unshaded area referring to Fig.B

d) Two blocks of weights W1 and W2 connected with a string rest on a rough incline, as shown in figure. If the coefficient of friction are 0.2 and 0.3 for the blocks, respectively and W1= W2= 50 N, find the value of α for which sliding will impend. (**Fig. C)**

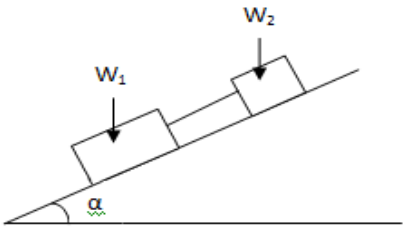

Fig. C

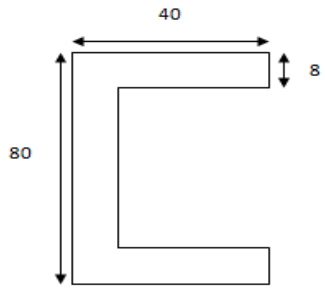

Fig. D

e) Determine the second moment of channel section **(Fig. D)** about the centroidal x-axis. All the dimensions are in mm.

f) A pile driver of weight 1700 kg falls from height 0.7m on a pile of weight 700 kg. Assuming plastic impact, determine the common velocity after impact. Also determine the average ground resistance, assuming the pile comes to rest after penetrating 7 cm into ground.

g) A, B and C are three perfectly elastic balls having masses 4 kg, 12 kg and 24 kg respectively. The balls are moving along the same direction with velocities 16 m/s, 5.34 m/s and 2.67 m/s respectively. If during motion, A hits B and then B hits C, explain the motion of all the balls after hitting each other.

h) Two cars A and B travelling in the same direction get stopped at a traffic signal. When the signal turns green, car A accelerates at 0.75 m/s^2. After 1.75 second, car B starts and accelerates at 1.1 m/s^2. Determine (i) when and where B will overtake A and (ii) the speed of each car at that time.

i) Write the general principles in stone masonry construction.

j) Define and explain the workability of concrete.

k) With a neat sketch give a brief description about collapsible doors.

l) Explain the factors affecting workability of concrete.

Part-III

Long Answer Type Questions (Answer Any Two out of Four)

Q3 A block of 3 kN weight is suspended from a framework as shown in Fig.E. Determine the forces in wires AB and EF. Also determine the string forces at CB and CF. **(16)**

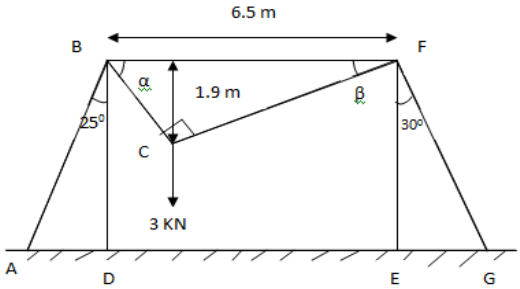

Fig. E

Q4 Find the forces in all members of the pin jointed truss as shown in Fig. F by method of joints. **(16)**

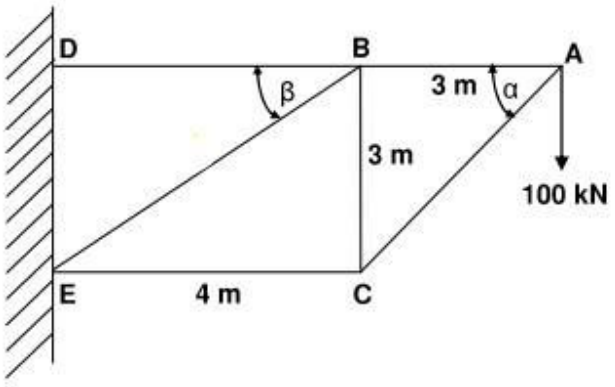

Fig. F

Q5 The following bearings were observed while traversing with a compass. Mention which stations were affected by local attraction and determine the corrected bearings. **(16)**

Line	Fore Bearing	Back Bearing	Line	Fore Bearing	Back Bearing
AB	$45^0\,45'$	$226^0\,10'$	CD	$29^0\,45'$	$209^0\,10'$
BC	$96^0\,55'$	$277^0\,5'$	DE	$324^0\,48'$	$144^0\,48'$

Q6 Enumerate the laboratory tests for cement and describe any two of them. **(16)**