

BE - 204

B.E. I & II Semester Examination, June 2015

Basic Civil Engineering & Engineering Mechanics

Time : Three Hours

Maximum Marks : 70

Note: i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.

ii) All parts of each questions are to be attempted at one place.

iii) All questions carry equal marks, out of which part A and B (Max.50 words) carry 2 marks, part C (Max.100 words) carry 3 marks, part D (Max.400 words) carry 7 marks.

iv) Except numericals, Derivation, Design and Drawing etc.

1. a) Explain the function of adding gypsum in the manufacture of portland cement.
- b) What are the good qualities of first class bricks?
- c) Define cement concrete and mention its properties.
- d) Explain, with the help of sketches, various types of spread footing.

OR

State the circumstances under which you use the following types of stairs :

- i) Dog legged stair
- ii) Spiral stair

2. a) What are the main functions of a Theodolite?
- b) Convert the following W.C.B. into Q. B.
 - i) $N 35^{\circ} - 10' W$
 - ii) $S 88^{\circ} - 30' E$
- c) Explain the principle of Electronic distance measurement.
- d) The following consecutive reading were taken by a level 0.975, 1.225, 1.465, 1.025, 1.825, 1.355, 0.785, 0.235, 2.135, 1.225, 3.160 the instrument was shifted after fourth and seventh readings. Enter the data in level book and calculate R.L. of all points by any one method if the first reading was taken on B.M. 100.0 m.

OR

What is Local attraction? How it is detected and removed?

3. a) Define the following terms :
 - i) Horizontal Equivalent
 - ii) Survey station
- b) With reference to Civil Engineering Practice, Explain what is meant by the prismoidal rule?
- c) Show with neat sketches the characteristic features of contour lines for the following :
 - i) A ridge
 - ii) A vertical cliff
- d) The following offsets were taken from chain line to hedge:

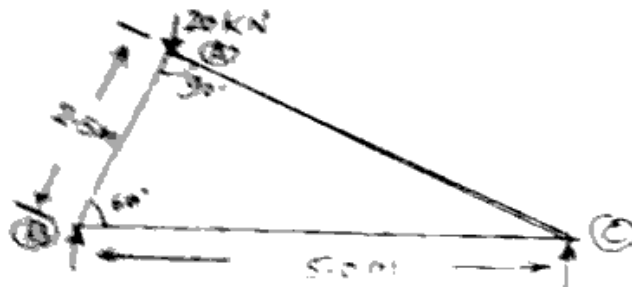
Distance	0	20	40	60	80	120	160	220	280
Offset	9.4	10.8	13.6	11.2	9.6	8.4	7.5	6.3	4.6

Compute the area included between the chain line and the offset by
 - i) Mid ordinate rule
 - ii) Simpson's rule

OR

Explain in brief the various methods of measurement of area by offsets from the base line.

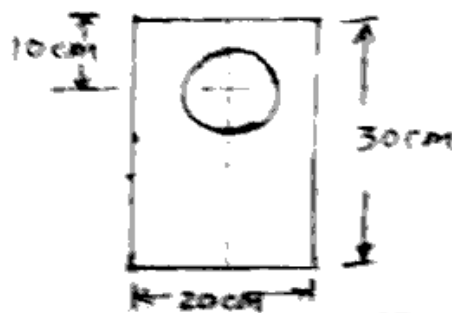
- What is the difference between collinear and concurrent forces?
- State and explain the law of polygon of forces.
- A body of weight W is resting on a rough inclined plane. Draw free body diagram of the body. Write also equations of equilibrium.
- Find the forces in the members AB and AC of the truss shown in figure using method of section.



OR

What are the different methods of analysis of a perfect frame? Which one is used where? Why?

- Distinguish between centre of gravity and centroid.
 - Explain the following terms:
 - Principle axes
 - Radius of Gyration
 - Explain the term 'Support Reaction'. What are the different types of support?
 - Find the moment of inertia of a hollow section shown in figure about an axis passing through its C.G. or parallel to $x-x$ axis.



OR

A beam 5.0 m long and simply supported at each end, has a uniformly distributed load of 1000 N/m extending from the left end to a point 2.0 m away. There is also a clockwise couple of 1500 N-m applied at the centre of the beam. Draw the S.F and B.M. diagram for the beam.
