

Roll No

CE-110**B.E. (All Branches), I Year II Semester**

Examination, June 2016

Choice Based Credit System (CBCS)**Engineering Mechanics***Time : Three Hours**Maximum Marks: 60***Note:** i) Attempt any five questions.

ii) All questions carry equal marks.

iii) Answer should be precise and to the point only.

iv) Assume suitable data if necessary and state them clearly.

1. a) Define the term "Force" and state clearly the effects of force. What are the various characteristics of a force?
b) A square ABCD has sides equal to 200 mm forces of 150 N each act along AB and CD and 250 N each along CB and AD. Find the moment of the couple, which will keep the system in equilibrium?
2. a) State and prove parallelogram law of forces.
b) A wire is fixed at two points A and D at same level. Two weights 20kN and 25kN are suspended at B and C respectively. When equilibrium is reached it is found that inclination at AB is 30° and that of CD is 60° to vertical. Determine the tension in the segments AB, BC and CD of the rope and also the inclination of BC to the vertical.
3. a) State and prove the Varignon's principle of moments.
b) Discuss various types of supports and beams with sketches.
4. a) What are the assumptions made, while finding out the forces in the various members of a framed structure? Discuss the method of section for the analysis of pin-jointed frame.
b) A body consisting of cone and hemisphere of radius R fixed on the same base rests on a table, the hemisphere being in contact with the table. Find the greatest height of the cone, so that the combined body may stand upright.
5. a) Derive an expression for moment of inertia of a triangular section about its Centroidal axis parallel to base.
b) A simply supported beam of span 6 m is carrying a uniformly distributed load of 2kN/m over a length of 3 m from the right end B. Calculate the support reactions.
6. a) Discuss various basic terms used in dynamics in detail. State general principles in dynamics.
b) A small steel ball is shot vertically upwards from the top of a building 25 m above the ground with an initial velocity of 18 m/sec. Find the total time during which the body is in motion.
7. Write short notes on any four of the following :
a) Fundamental Laws of Mechanics
b) Bow's Notation
c) Types of loading on beam
d) Parallel axis theorem
e) Types of motion
