B.Tech / Integrated (MBA/M.Tech) 3rd Sem (ME) Examination
June 2014
Engineering Mechanics
Subject Code: MEL-205

Time Allowed: 03 hours. Maximum Marks: 100

Before answering the question paper the candidate should ensure that they have been supplied the correct question paper. Complaints in this regard, if any, shall not be entertained after the examination.

Note: Question No. 1 is Compulsory and attempt two questions from each section. All questions carry equal marks.

Q1(a) Define vector and scalar quantity? Explain with example.
   (b) What is difference between static friction and dynamic friction?
   (c) Differentiate between perfect and imperfect truss? Explain with example.
   (d) Explain center of gravity and centroid of anybody? (5X4)

SECTION-A

Q2. A system of forces acting on a body is as shown in Fig. Determine the magnitude and direction of resultant. (20)
Q3. Find the forces in all the members of the truss shown in Fig. Tabulate the results. (20)

Q4. (a) State and prove (1) Perpendicular axis theorem (2) Parallel axis theorem of moment of inertia. (10)
(b) Determine the moment of inertia of the section shown in Fig. about an axis passing through the centroid and parallel to the top most fiber of the section. (10)

Q6.(a) Determine the centroid of a triangle of base width ‘b’ and height ‘h’ by the method of integration. (10)
(b) Locate the centroid of the I-section shown in the Fig. (10)

Q7.(a) Write the short note on the following topic:
1. Velocity and acceleration (3)
2. Work energy method (3)
3. D’ Alembert’s principle (4)
(b) Define the Impulse and momentum of any mechanical body and also explain the difference between relative motion, translatory motion & rotatory motion of body. (10)