I B. Tech I Semester Supplementary Examinations, April - 2021
ENGINEERING MECHANICS
(Com. to CE, ME, CSE, PCE, IT, Chem. E, Aero E, AME, Min E, PE, Metal E, Textile Engg)

Time: 3 hours　　　　　　　　　　　　　　　　　　　　　　　　Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answer **ALL** the question in **Part-A**
3. Answer any **THREE** Questions from **Part-B**

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PART –A

1. a) Differentiate between composition of forces and resolution of a force. (4M)

   b) Explain the term redundant constraints. (3M)

   c) What is the importance of centroid? (3M)

   d) Explain the transfer formula for product of inertia. (4M)

   e) Explain the terms: Time of flight, Range. (4M)

   f) Explain impulse momentum method for a plane body in general motion. (4M)

PART -B

2. a) Four forces equal to P, 2P, 3P and 4P are acting along the four sides of a square ABCD respectively taken in order. Side = 40 mm. Find the magnitude, direction and position of the resultant force. (8M)

   b) A block of weight 80 N is placed on a horizontal plane where the coefficient of friction is 0.25. Find the force that should be applied to the block at an angle of 30^0 with the horizontal to attain the condition of limiting equilibrium. (8M)

3. A strut AB attached to the face of a vertical wall at A by a spherical hinge stands perpendicular to the wall and is supported by two guy wires, as shown in Figure below. At B, in a plane parallel to the wall, two forces P and Q acts as shown, Q being horizontal and P, vertical. Find the axial forces produced in the members if P = 1500 N and Q = 2500 N. (16M)

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