

**B.Tech. Civil (Construction Management) /
B.Tech. Civil (Water Resources Engineering) /
BTCLEVI/BTMEVI/BTELVI/BTECVI/BTCSVI**

Term-End Examination

00237

December, 2017

ET-202(A) : ENGINEERING MECHANICS

Time : 3 hours

Maximum Marks : 70

Note : Answer any **five** questions. Use of scientific calculator is allowed. Assume any suitable data, if required.

1. (a) A force of 400 N is inclined at 45° , 65° and 120° respectively with x, y and z axes. Express the force in vector form. 7
- (b) A smooth sphere weighing 200 N is resting as shown in Figure 1. Determine the reactions at the support points A and B. 7

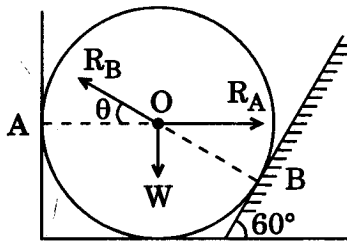


Figure 1

2. (a) What do you understand by 'Moment of a Couple'? Write any two properties of couples. 7
- (b) Four coplanar concurrent forces act at a point and keep it at rest, as shown in Figure 2. Determine the values of forces P and Q. 7

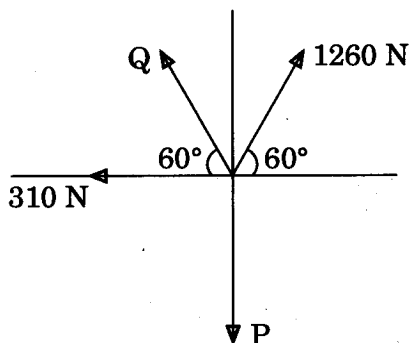


Figure 2

3. (a) Draw the free body diagram of a cantilever of span L which is subjected to a UDL of intensity w over its whole span. 7
- (b) What do you understand by static friction? Show its variation for an object from a condition of rest to that of impending motion with the help of a neat sketch. 7
4. (a) Write the statement of Parallel Axis theorem as applied to moment of inertia of an area. 7
- (b) Determine the centre of gravity of a right circular cone of height 'H' and base radius 'a'. 7

5. (a) The motion of a particle is determined by the equation $s = t^4 - 3t^3 + 2t^2 - 8$, where s is in metres and t in seconds. Determine the velocity and acceleration when $t = 2$ seconds. 7
- (b) Explain the difference between average acceleration and instantaneous acceleration of a moving body. 7
6. (a) What do you understand by Principle of Conservation of Energy ? Explain briefly. 7
- (b) Differentiate between an elastic and a plastic impact. 7
7. Write short notes on any *two* of the following topics : $2 \times 7 = 14$
- (a) Internal Forces
- (b) Modulus of Elasticity
- (c) Rigid Body
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