

No. of Printed Pates : 4

ET-202(A)

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

Term-End Examination, 2019

ET-202(A) : ENGINEERING MECHANICS

Time : 3 Hours]

[Maximum Marks : 70

Note : Answer any five questions. All questions carry equal marks. Use of Scientific Calculator is permitted. Assume missing data, if any.

1. (a) With the help of neat sketch, explain the law of parallelogram of forces. [7]
- (b) Determine the resultant of the forces given in figure-1: [7]

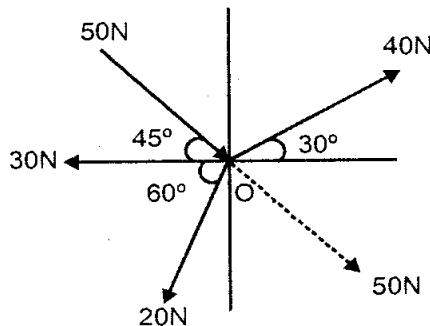


Figure : 1

2. (a) A smooth sphere weighing 400N is resting as shown in **Fig. 2**. Determine the reactions at the supports : [7]

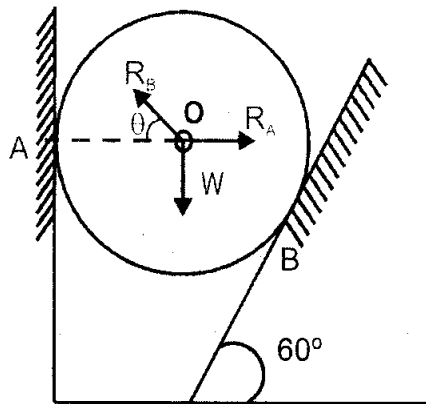


Figure : 2

- (b) (i) State Varignon's Theorem
- (ii) Differentiate between pressure and stress. [3.5x2=7]
3. (a) With the help of an example separately, explain :
 (i) wedge friction and (ii) screw friction. [7]
- (b) Derive the expression for tension ratio $\frac{T_1}{T_2}$ as $e^{\mu\theta}$. [7]

4. (a) Determine the centroid of the shaded area shown in figure 3. [7]

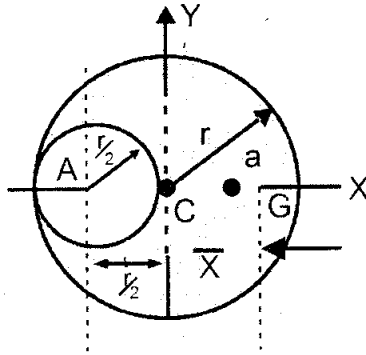


Figure : 3

- (b) With the help of example, explain mass moment of inertia. [7]

5. Define : [2x7=14]

- (i) Rectilinear Motion
- (ii) Curvilinear Motion
- (iii) SHM
- (iv) Plane Motion
- (v) D'Alembert's Principle
- (vi) Dynamic Equilibrium

(vii) Inertia force. [2x7=14]

6. (a) Write the Principle of conservation of momentum.

A shell of mass 200gm is fired at a velocity of 5m/sec by a source of mass 20Kg. Determine recoil velocity of source. [3+4=7]

(b) Deduce the expression for Kinetic energy of rotation about axis of rotation (KK) as $\frac{1}{2} I_{m, KK} \omega^2$. [7]

7. Determine the nature and magnitude of forces in all members given in figure 4. [14]

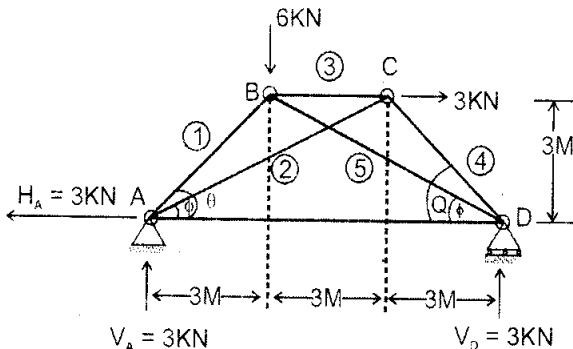


Figure : 4

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