**B.Sc. DEGREE EXAMINATION, APRIL 2017**

**II YEAR — IV SEMESTER**

**MAJOR PAPER – VIII - STATICS**

**Time : 3 hours Max. Marks : 75**

**SECTION A — (10 × 2 = 20 marks)**

**Answer any *TEN* questions.**

1. Define linear moment.
2. If the resultant of two forces acting at a point with magnitudes 7 and 8 is a force with magnitude 13, find the angle between two forces.
3. List the forces that act on a particle which is in limiting equilibrium with a tendency to slide up the plane are.
4. Define parallel forces. What are the types of parallel forces.
5. When the two forces are said to be equivalent.
6. Define couple.
7. Can a couple and a force keep rigid body in equilibrium?
8. Define centre of mass.
9. Write the mass centre of the solid hemisphere of radius “a”.
10. When the forces are said to be coplanar.
11. Write the mass centre of lamina in the form of a sector of a circle of radius “a”.
12. State the three laws of motion by Newton.

**SECTION B — (5 × 5 = 25 marks)**

**Answer any *FIVE* questions**

1. The forces of magnitude F1.F2,F3 act on a particle, If there are parallel to BC,CA,AB where ABC is a triangle Show that the magnitude of their resultant is $\sqrt{F\_{1}^{2}+F\_{2}^{2}+F\_{3}^{2}-2F\_{2}F\_{3}\cos(A)-2F\_{3}F\_{1}\cos(B)-2F\_{1}F\_{2}\cos(C)}$.
2. Show that the greatest inclination of a rough inclined plane to the horizon so that the particle will remain on it is at rest is equal to the angle of friction.
3. Two forces *F1* and *F2* acts at a point *A. P* is moving point such that the moment of F­1 and F2 about *P* are equal. Find the locus of *P*.
4. Prove that a system of coplanar forces reduce either to a single force or single couple.
5. Derive the mass centre of Cardioid lamina.
6. Derive the mass centre of the hollow right circular cone of height *h*.
7. Two coplanar couples whose moments are equal in magnitude but opposite in direction keep a rigid body in equilibrium.

**SECTION C — (3 × 10 = 30 marks)**

**Answer any *THREE* questions**

1. State and prove the Lami’s theorem.
2. Discuss the equilibrium of the particle in the inclined plan acted on by a force.
3. Find the resultant of two parallel forces acting on a rigid body.
4. Discuss if three coplanar forces keep a rigid body in equilibrium.
5. Derive the mass centre of the solid right circular cone of height *h.*

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