**Applications of Vectors in Mechanics**

**Type – 1**

**Choose the most appropriate option (a, b, c or d).**

Q 1. P is a point in the plane of the ΔABC whose orthocenter is H and the circumcentre is O. Forces  and  act at P. The force that will keep the given forces in equilibrium is

(a)  (b)  (c)  (d) none of these

Q 2. Three forces and each of 15 units, act along AB, BC and CA respectively. The position vectors of A, B and C are ,  and . The resultant force vector is

(a) 

(b) 

(c) 

(d) none of these

Q 3. A ship is sailing towards north at a speed of 1.25 m/s. The current is taking it towards east at the rate of 1 m/s. A sailor is climbing a vertical pole on the ship at the rate of 0.5 m/s. The magnitude of the velocity of the sailor in space is

(a) 2.75 m/s (b)  (c)  (d) none of these

Q 4. A force displaces a particle from the point A to the point B. The position vectors of A and B are and respectively. Then the work done is

(a) 40 (b) 20 (C) 60 (d) none of these

Q 5. Constant forces and  act on a particle. The work to the point B with position vector is

(a) 15 (b) 13 (c)  (d) none of these

Q 6. The vertices of a triangle ABC are A(–1, 0, 2), B(1,2, 0) and C(2, 3, 4). The moment of a force of magnitude 10 acting at A along AB about C is

(a)  (b)  (c)  (d) none of these

Q 7. The vector moment about the point of the resultant of the forces and  acting at the point is

(a)  (b)  (c)  (d) none of these

Q 8. A rigid body is rotating at 5 radians per second about an axis AB, where A and B are points whose position vectors are  and respectively. The velocity of the particle of the body at the point whose position vector is is

(a)  (b)  (c)  (d) none of these

**Type 2**

**Choose the correct options. One or more options may be correct.**

Q 9. A particle is in equilibrium when the forces  and act on it. Then

(a) u = 65(1 – 3cot θ) (b)  (c) w = 40cosec θ (d) none of these

Q 10. The resolved parts of the force vector  along and perpendicular to the vector  are  and respectively. Then

(a)  (b) 

(c)  (d) 

**Answers**

1c 2a 3b 4a 5b 6a 7b 8a 9b,c 10a,c