31. A man of mass 60 kg stands at one end of a 20 m long boat of mass 440 kg. When the man walks to the other end, the displacement of the boat is
    (1) 10 m   (2) 5.0 m   (3) 2.4 m   (4) zero

32. A balloon of total mass 1000 kg floats motionless over the earth's surface. If 100 kg of sand is thrown out. The balloon starts rising with an acceleration of
    (1) 10 ms^{-2} (2) 9.8 ms^{-2} (3) 1.09 ms^{-2} (4) zero

33. The motion of a rocket is based on the principle of conservation of
    (1) linear momentum   (2) mass   (3) angular momentum (4) kinetic energy

34. A gun of mass 10 kg fires 4 bullets per second. the mass of each bullet is 20 g and the velocity of the bullet when it leaves the gun is 300 m s^{-1}. The force required to hold the gun when firing is
    (1) 6 N   (2) 8 N   (3) 24 N   (4) 240 N

35. A particle is moving with velocity is acted by three forces shown by the vector triangle PQR. The velocity of the particle will
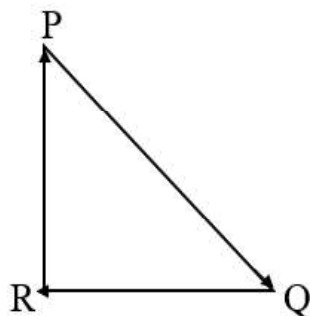
    (1) increase   (2) decrease
    (3) remain constant   (4) change according to the smallest force

SECTION-B

36. A balloon has 8 gram of air. A small hole is pierced into it. The air escapes at a uniform rate of 7 cm s^{-1}. If the balloon shrinks in 5.6 seconds then the average force acting on the balloon is
    (1) 10^{-4}N   (2) 10^{-2} dyne   3) 56 dyne   4) 10^{-6} N

37. Same force acts on two bodies of different masses 3kg and 5kg initially at rest. The ratio of times required to acquire same final velocity is
    (1) 5:3   (2) 25:9   (3) 9:25   (4) 3:5

38. A body of mass 2 Kg has an initial velocity of 3 metre/sec along OE and it is subjected to a force of 4 N in a direction perpendicular to OE. The distance of body from O after 4 sec will be:
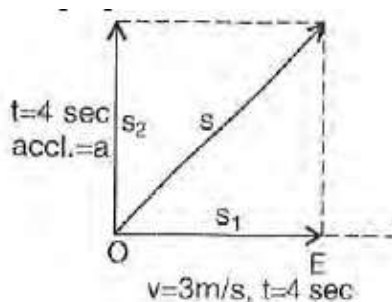
    (1) 12 metre   (2) 20 metre   (3) 8 metre   (4) 48 metre

39. The momentum of a body in two perpendicular direction at any time t are given by $p_x = 2t^2 + 6$ and $P_y = \dfrac{3t^2}{2} + 3$ force acting on the body at t = 2S is
    (1) 5 unit   (2) 2 unit   (3) 10 unit   (4) 15 unit

40. A horizontal jet of water coming out of a pipe of area of cross section 20 cm² hits a vertical wall with a velocity of 10 ms^{-1} and rebounds with the same speed. The force exerted by water on the wall is (ρ =10^3 Kg/m³)
    (1) 0.2 N   (2) 10 N   (3) 400 N   (4) 200 N