PHYSICS

1. **A man in a boat A pulls a rope with a force 100N. The other end of the rope is tied to a boat B of mass 200 kg. the total mass of boat A and man is 300kg, disregard the weight of the rope and the resistance of the water. The power developed by the man by the end of the third second is**

   a) 100W

   b) 200 W

   c) 150W

   d) 250 W

2. **A launch takes 3 hours to go downstream from point A to B and 6 hours to come back to A from B. The time taken by the launch to cover the same distance downstream when its engine cutoff is ……**

   a) 12 hrs.

   b) 9 hrs.

   c) 4.5 hrs.

   d) 18 hrs.

3. **An ammeter and a voltmeter are joined in series to a cell. Their readings are A and V respectively. If a resistance is now joined in parallel with the voltmeter, ….**

   a) A will increase, V will decrease

   b) both A and V will increase

   c) both A and V will decrease

   d) A will decrease, V will increase

4. **A narrow beam of light is incident on a 30°- 60°- 90° prism perpendicular to the surface AB. Assume that light beam is close to A. The index of refraction of prism is 2.1. See figure and take Sin^{-1} (10/21) =28° 26′. The beam emerges from the face…….**

   a) CB

   b) AB

   c) AC

   d) Some light through AC and remaining light through AB

5. At what height above the earth's surface is the acceleration due to gravity 1% less than its value at the surface Radius of earth is 6400 km. Take $(1+X)^{-2} = 1-2X$ when $x \ll 1$

a) 16 km

b) 32 km

c) 64 km

d) 32 √2 km

6. An ant runs from an ant-hill in a straight line so that its velocity is inversely proportional to the distance from the center of ant-hill. When the ant is at a point A at a distance 1m from the center of the hill, its velocity is 2 cm/s. Point B is at a distance of 2 m from the center of the anthill. The time taken by the ant to run from A to B is …….

a) 25 s   b) 75s
c) 55s   d) 65s

7. The two ends of a horizontal conducting rod of length l are joined to a voltmeter. The whole arrangement moves with a horizontal velocity u, the direction of motion being perpendicular to the rod. The vertical component of earth's magnetic field is B. The voltmeter reading is ….

a) Blv only if the rod moves eastward

b) Blv only if the rod moves westward

c) Blv only if the rod moves in any direction

d) zero

8. A ball of uniform density 2/3 of that of water is dropped freely into a pond from a height 10m above its surface. The maximum depth the ball can travel in water is ….

a) 21m   b) 10m
c)20m   d)30m