Physics Revision Test 2

Time : 120 mins

Max Marks : 46

Q1.

(a) Give practical unit of power? 1 mark

(b) The direction in which an object moves is given by the direction of velocity of the object and not by the acceleration. Justify this statement.

2 mark

Q2. Find the resultant of two vectors when the two vectors a) along the same direction b) along Opposite direction c) right angles to each other.

3 marks

Q3. Determine

A) A force of 72dyne is inclined to the horizontal at an angle of 60º. Find the acceleration in mass of 9g which moves in horizontal direction.

B) Why there are two propellers in the helicopter?.

4 marks

Q4 Point out the measurable likely to create the maximum error in the following experimental measurement

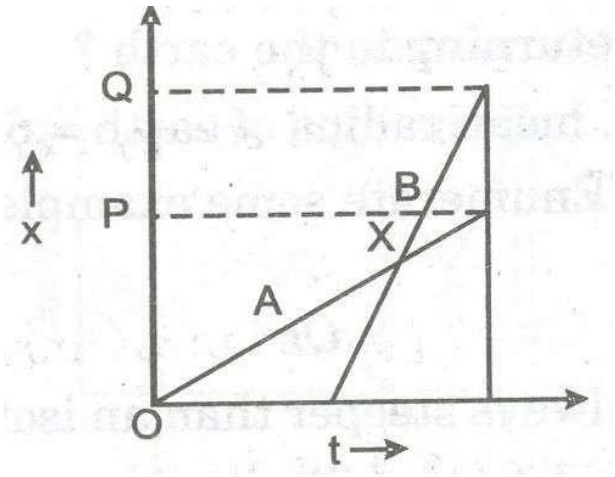
Young's Modulus of the material of the beam is calculated using the relation

$$Y = \frac{mgl^3}{4bd^3\delta}$$

when w =mg, 8 = depression; 1, b, d = length, breadth, thickness.

3 marks

Q5 The position-time (x-t) graphs for two children A and B returning from their school 0 to their homes P and Q respectively are shown. Choose the correct entries:



(a) (A/B) lives closer to the school than (B/A).
(b) (A/B) starts from the school earlier than (B/A).
(c) (A/B) walks faster than (B/A).
(d) A and B reach home at the (same/different) time. (HOTS)
(e) (A/B) overtakes (B/A) on the road (once/twice).

3 marks

Q6. The position of a particle is given by $\vec{r}$ = 3.0t$\hat{\imath}$ – 2-0t$^2\hat{\jmath}$ + 4.03$\hat{k}$ m,

where t is in seconds and the coefficients have the proper units for x to be in metres. (a) Find v and a of the particle ? (b) What is the magnitude and direction of velocity of the particle at t = 2.0 s?

2 marks

Q7. Show that momentum is conserved.

3 marks

Q8. Derive the relations :
(i) $v^2 = u^2 + 2as$
(ii) $v = u + at$
(iii) $s = ut + 1/2\ at^2$.

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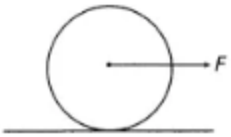
. 4 marks

Q9.
(a) In a car race, car A takes a time t less than car B and finishes the finishing point with a velocity v more than that of the car B. Assuming that the cars start from rest and travel with, show constant accelerations a_1 and a_2 respectively, show that $v = \sqrt{(a_1.a_2)}$
(b) The displacement of a particle moving in one dimension under the action of a constant force is related to the time t by the equation t = √x + 3, where x is in metre and t is in second. Find the displacement of the particle when its velocity is zero.

4 marks

Q10. Prove the theorem of perpendicular axis.
Or Prove the theorem of parallel axis.
5 marks.

Q11. A uniform disc of radius R is resting on a table on its rim. The coefficient of friction between disc and table is μ Now the disc is pulled with force F as shown in figure.
What is the maximum value of F for which the disc rolls without slipping.



3 marks

Q12. Draw a graph showing the two objects moving with same velocity in same direction.
A car A moving at 10 m/s on a straight road is ahead of car B moving in same direction at 6 m/s. Find the relative velocity of A wrt B.

3 marks

Q13. State torque. State its SI unit with the help of suitable diagram, show that the torque is equal to product of force and the perpendicular distance of its line of action from the axis of rotation.

3 marks

Q14. A cricket bowler releases the ball in two different ways :
a) giving it only horizontal velocity
b) giving it horizontal velocity and small downward velocity.
The speed v at the time of release is same. Both are released at height H from the ground. Which one will have greater speed when the ball hits the ground ?
Neglect the air resistance.

3 marks