

First Term Exam - 2016

Set- II

Class- XI Subject- Physics

Max Marks- 70

Time- 3 hrs.

Instructions:

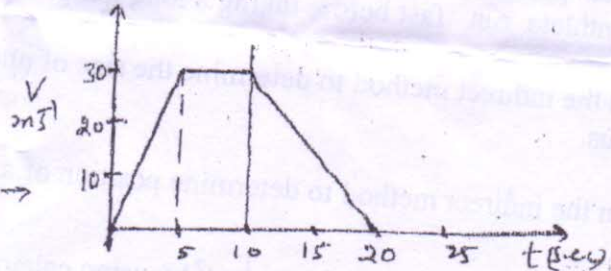
- All questions are compulsory. read them carefully and answer neatly and to the point.
- Q 1 - 5 each carries 1 mark, Q 6 - 13 each carries 2 marks, Q 14 - 23 each carries 3 marks, Q. 23 value based question carrying 4 marks and Q 25 - 27 each carries 5 marks.
- There is no overall choice however internal choices have been provided, one for 1 mark, one for 2 marks, one for 3 marks and one for each of 5 marks questions.

Q1. Write the dimensional formulae of the following---(a) Planck's constant. (b) energy

Q2. Define instantaneous velocity.

Q3. Two trains A and B are running on parallel tracks in north and south direction respectively. The speed of A is 100 km h^{-1} and that of B is 150 km h^{-1} . What is the relative velocity of A w.r.t. B and relative velocity of B w.r.t. A.

Q4. Write the number of significant fig. in the following
(i) $2.05 \times 10^{-5} \text{ m}$. • (ii) 3.005



Q5. The v-t graph for particle in motion given in fig.(i). → draw the corresponding accelⁿ - time graph

Q6. A force is applied to a mass of 5 kg to produce an acceleration 4 ms^{-2} . If the same force is applied to a body of mass 2 kg. then what the acceleration.

Q7. Name the science responsible for the discoveries of (a) proton (b) neutron (c) electron (d) theory of relativity

Q8. Check the correctness of the formula -- $T = 2\pi\sqrt{l/g}$ by dimensional method.

Q9. The angular diameter of of a star as observed from the earth is $0.2''$. The distance of star from the earth is 3.0 light year. What is the linear diameter of the star.

Q10. Find the angle between the two vectors $\vec{a} = i - j + 2k$ and $\vec{b} = 2i + j - 2k$.

Q11. It rains with velocity 15 ms^{-1} vertically downward. A motorcyclist speeding along a road towards north observes the rains inclined at 30° . What is the speed of motorcyclist.

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12. A bullet of mass 10 g is fired with velocity 100 ms^{-1} by a gun mass 5 kg. Find recoil velocity of the gun.

13. A cricket ball is thrown vertically upward with velocity 20 ms^{-1} . How high the ball will go up and for how long time the player should wait for the ball to fall back in his hand.

14. Prove 3rd law of motion by using 2nd law.

15. A boy wants to keep a brick of mass 3.0 kg. In touch with a vertical wall. The min^m normal. He should apply is 50 N. Find the coefft. Of friction b/w the brick and the wall.

16. Prove that vector addition is associative.

17. A football player kicks a ball with speed 20 ms^{-1} at an angle 30° w.r.t. the ground. At what distance other player be standing to stop the ball. (b) How long time the ball remains in air. (c) How high the ball goes up in air.

18. A man weight 60 kg uses a lift. What are his apparent weight when

- (a) The lift accelerates upward with $a = 3 \text{ ms}^{-2}$
- (b) The lift accelerates downward with $a = 2 \text{ ms}^{-2}$
- (c) The lift moves downwards with const. velocity 8 ms^{-1} .

19. Explain the reasons -----

- (a) When a passenger jumps off from a slowly running bus he falls forward
- (b) When person jumps off from a boat in water, the boat moves backward
- (c) An athlete runs fast before taking a long jump.

20. Explain the indirect method to determine the size of nucleus. An element has atomic mass 64. What is its radius.

OR explain the indirect method to determine position of a ship in water by using SONAR method.

Q 21. Prove the relation $x - x_0 = v_0 t + \frac{1}{2} a t^2$ by using calculus method.

Q22. A bomber plane is flying horizontally at height 1 km. It drops a bomb at an instant of time.

- (a) How long does it take to hit the target.
- (b) Find the equation of trajectory of bomb.
- (c) What is the horizontal distance of the target.

Q23. State and prove the law of conservation of momentum.

Q24. Ramesh is riding a bicycle with a banner. When he is not in motion the banner shows east direction. But when he starts moving north, the banner indicates south east direction. On arriving home he asked his elder brother the Cause.

- (a) What would be possible answer given by his brother.
- (b) What would be direction indicated by banner if he would have motion in south direction.
- (c) Explain similar situation observed by you.

25. Convert the following as directed(use three significant figures only):-

- (a) One light year in m.
- (b) One minute angle in radian
- (c) One year time in second
- (d) 1 kmh^{-1} in cms^{-1}
- (e) 1 ms^{-1} in kmh^{-1}

26. Two towns A and B are connected by a regular bus service with a bus leaving in either direction every T min. A man cycling with speed 18 kmh^{-1} from A to B finds that a bus goes past him every 18 min in his direction and every 6 min in opposite direction. What is the period T of bus service and what is the speed of the bus?

OR A man can swim with speed 8 kmh^{-1} in still water. He wants to cross a river of speed 6 kmh^{-1} . How should he swim in the river (a) to cross in shortest time, (b) to cross along the shortest distance.

27. Explain the five applications of physics in our daily life.

OR Explain various conservation laws in physics world.



Balraj

Speed of
river 6 kmh^{-1}

Speed of
swimmer 8 kmh^{-1}