DEEP PUBLIC SCHOOL
D-2, VASANT KUNJ, NEW DELHI-110070
FIRST TERMINAL EXAMINATION(2014 - 2015)
CLASS –XI

Subject: Physics   No. of Pages:02

Time: 3 hrs   M.M.: 70

1. What is light year? Write its value in meter? (1)

2. What is parallax method? Write an expression for it? (1)

3. Why is S.I. system of unit called "coherent" and "Rational" system of unit? (1)

4. Write an expression to find the relative error? (1)

5. Write two limitations of dimensional analysis. (1)

6. Can a body have constant velocity but varying acceleration? (1)

7. Define "Instantaneous acceleration". (1)

8. What are concurrent forces? (1)

9. When are velocity and speed equal? (1)

10. Write the S.I. unit of angular displacement? (1)

11. If $p = \dfrac{a^2 b^3}{\sqrt{c}}$ and percentage error in a, b and c are 2%, 3% and 3% respectively, find the percentage error in p? (2)

12. State Newton's first law of motion. (2)

13. Check the correctness of formula $s = ut + \dfrac{1}{2}at^2$, dimensionally where s is displacement, u is velocity, a is acceleration and t is time. (2)

14. If the two vectors are in the ratio of 3 : 5 act on a body and their resultant is 35 N, if the angle between them is $90°$, find the magnitude of two vectors? (2)

15. The density of a material in cgs system is 8 g cm^{-3}. In a system of units, in which unit of length is 5 cm and unit of mass is 20 g, what is the density of the material? (2)

16. Prove that $1\ J = 10^7$ erg. (2)

17. Write the dimension of $\dfrac{a}{b}$ in the relation $F = a\sqrt{x} + bt^2$, where F is force, x is distance and t is time. (2)

18. A man can jump on moon six times as high as on earth. Why? (2)

19. Give two examples of circular motion with constant speed? (2)

20. A velocity of 10 ms^{-1} has its y-componet $5\sqrt{2}$ ms^{-1}. Calculate its x-component. (3)

21. Show that Newton's second law of motion is the real law of the motion. (3)

22. Find the expression for apparent weight of a man in a lift on weighing machine for different cases. (3)

23. A body of mass 5 kg is acted upon by two perpendicular forces 8 N and 6 N. Find the magnitude and direction of the acceleration. (3)

24. A constant force acting on a body of mass 3 kg changes its speed from 2 ms^{-1} to 3.5 ms^{-1} in 25 sec. The direction of the motion of the body remains unchanged, what is the magnitude and direction of the force? (3)

25. Two bodies of masses 10 kg and 20 kg respectively kept on a smooth horizontal surface, are tied to the ends of a light string. A horizontal force F = 600 N is applied to (1) A and (2) B along the direction of the string. What is the tension in the string in each case. (3)
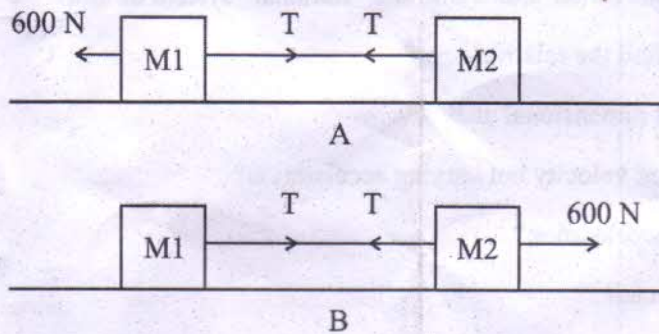
26. A shell of mass 0.02 kg is fired by a gun of mass 100 kg. If the muzzle speed of the shell is 80 ms^{-1}, what is the recoil speed of the gun? (3)

27. At what angle the two forces A + B and A − B act so that their resultant is $\sqrt{3A^2 + B^2}$. (3)

28. Derive an expression to show the relation between linear velocity and angular velocity. (3)

29. Derive the equation of uniform accelerated motion using calculus method. (5)

OR

a) What is the law of conservation of momentum? Prove it.

b) What is Impulse? Write its S.I. unit.

30. What are projectiles? Give two examples? Derive an expression for: (5)

a) Time of flight   b) Maximum height   c) Horizontal range

OR

a) What do you mean by resolution of vectors and component of a vector?

b) Derive an expression for resultant vector when two vectors are at an angle of θ by analytical method.

31. i) Using Newton's second law of motion, prove that $F = ma$. (5)

ii) Prove that impulse is equal to change in momentum.