

VETRI NICHAYM TUITION CENTRE, AYYENGARKULAM

Time - 2.30 hours

QUARTERLY EXAM-2018

marks -75

Physics**PART-A****15*1=15**

1. If $x = at + bt^2$ where x is in meters and t is in seconds. What are the units of a and b ?
a. (m, s) b. (s, m) c. (m/s, m/s²) d. (m/s, m/s)
2. The dimensional formula of Planck's constant h is
a) [ML²T⁻¹] b) [ML²T⁻³] c) [MLT⁻¹] d) [ML³T⁻³]
3.have the same dimensional formula
a. Force and momentum b) Stress and strain c) Density & linear density d) Work & potential
4. If $\pi = 3.14$, then the value of π^2 is
a) 9.8596 b) 9.860 c) 9.86 d) 9.9
5. Which of the following has the highest number of significant figures?
a) 0.007 m² b) 2.64 x 10²⁴ kg c) 0.0006032 m² d) 6.3200 J
6. If a particle has negative velocity and negative acceleration, its speed
(a) increases (b) decreases (c) remains same (d) zero
7. Which one of the following physical quantities cannot be represented by a scalar?
(a) Mass (b) length (c) momentum (d) magnitude of acceleration
8. An object is dropped in an unknown planet from height 50 m, it reaches the ground in 2 s. The acceleration due to gravity in this unknown planet is
(a) $g = 20 \text{ m s}^{-2}$ (b) $g = 25 \text{ m s}^{-2}$ (c) $g = 15 \text{ m s}^{-2}$ (d) $g = 30 \text{ m s}^{-2}$
9. If a particle executes uniform circular motion, choose the correct statement
(a) The velocity and speed are constant (b) The acceleration and speed are constant (c) The velocity and acceleration are constant (d) The speed and magnitude of acceleration are constant.
10. The velocity of a particle v at an instant t is given by $v = at + bt^2$. The dimensions of b is
a) [L] b) [LT⁻¹] c) [LT⁻²] d) [LT⁻³]
11. If a person moving from pole to equator, the centrifugal force acting on him
(a) increases (b) decreases (c) remains the same (d) increases and then decreases
12. The centrifugal force appears to exist
(a) only in inertial frames (b) only in rotating frames
(c) in any accelerated frame (d) both in inertial and non-inertial frames
13. Force acting on the particle moving with constant speed is
(a) always zero (b) need not be zero (c) always non zero (d) cannot be concluded
14. When a car takes a sudden left turn in the curved road, passengers are pushed towards the right due to (a) inertia of direction (b) inertia of motion (c) inertia of rest (d) absence of inertia
15. The resultant of two vectors A and B is perpendicular to vector A and its magnitude is equal to half of the magnitude of vector B . Then the angle between A and B is

a) 30° b) 45° c) 150° d) 120° **PART-B Answer any 6 and 24 is compulsory:****6*2=12**

16) Define one newton.

17) What are inertial frames?

18) What is the meaning by 'pseudo force'?

19) State Newton's third law.

20) Define a radian?

20) Define acceleration.

21) Define a vector. Give examples

22 Round off the following numbers as Indicated i) 18.35 up to 3 digits ii) 19.45 up to 3 digits)

23) Write down the kinematic equations for angular motion.

24) State the number of significant figures in the following i) 5213.0 ii) $2.65 \times 10^{24} m$ **PART-C Answer any 6 and 31 is compulsory:****6*3=18**

25) What are the limitations of dimensional analysis?

26) How will you measure the diameter of the Moon using parallax method?

27) Write the rules for determining significant figures.

28) Write a short note on vector product between two vectors.

29) Define angular displacement and angular velocity.

30) Explain various types of friction. Suggest a few methods to reduce friction.

31) Check whether the following vectors are orthogonal. 1). $A=2i+3j$ and $B=4i-5j$ 2). $A=5i+2j$ $B=2i-5j$ 32) An object of mass 10 kg moving with a speed of $15 m s^{-1}$ hits the wall and comes to rest within a) 0.03 second b) 10 second**PART-D Answer all****6*5=30**

33) Derive the kinematic equations of motion for constant acceleration. (Or)

The force F acting on a body moving in a circular path depends on mass of the body (m), velocity (v) and radius (r) of the circular path. Obtain the expression for the force by dimensional analysis method. (Take the value of $k=1$)

34) Write short notes on the following. a) Unit b) Rounding – off c) Dimensionless quantities

(or) What do you mean by propagation of errors? Explain the propagation of errors in addition and multiplication.

35) Write a note on triangulation method and radar method to measure larger distances. (or) Explain in detail the various types of errors.

36) Explain in detail the triangle law of Addition (or) Derive the expression for centripetal acceleration

37) What are concurrent forces? State Lami's theorem. (or) Briefly explain 'rolling friction'.

38) State Newton's three laws and discuss their significance. (or) write the difference between centripetal force and centrifugal force

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