NEET PHYSICS 2018-19 - Chennai

Periodic Test : 05 **Test ID : 017**

Number of questions: 150 **Test date: 24.03.2019**

Name: _____ **Time**: 3HRS

ID No: _____

Negative Marks : 4 marks for correct attempt & 1 mark deducted for every wrong attempt.

1. A physical quantity of the dimensions of length that $\frac{e^2}{4\pi\varepsilon_0}$ can he formed out of is c,G and [C is velocity of light, G is the universal constant of gravitation and e is charge]

(a) $C^2\left|G\frac{e2}{4\pi\varepsilon 0}\right|^{1/2}$

(b) $\frac{1}{c2}\left|\frac{e2}{G4\pi\varepsilon 0}\right|^{1/2}$

(c) $\frac{1}{c}G\frac{e2}{4\pi\varepsilon 0}$

(d) $\frac{1}{c2}\left|G\frac{e2}{4\pi\varepsilon 0}\right|^{1/2}$

2. If dimensions of critical velocity v_c of a liquid flowing through a tube are expressed as $[\eta^x\rho^y r^z]$ Where η, ρ and r are the coefficient of viscosity of liquid. Density of liquid and radius of the tube respectively, then the values of x, y and z are given by

(a) -1-1-1

(b) 1,1,1

(c) 1,-1,-1

(d) -1,-1,1

3. If force (F), velocity (V) and time (T) are taken as fundamental, units, then the dimensions of Mass are

(a) $[FVT^{-1}]$

(b) $[FVT^{-2}]$

(c) $[FV^{-1}T^{-1}]$

(d) $[FV^{-1}T]$

4. The pair of quantities having same dimensions is

(a) Impulse and Surface Tension

(b) Angular momentum and Work

(c) Work and Torque

(d) Young's modulus and Energy

5. The dimensions of $(\mu_0\varepsilon_0)^{-1/2}$ are

(a) $[L^{1/2}T^{-1/2}]$

(b) $[L^{-1}T]$

(c) $[L^{-1}T^{-1/2}]$

(d) (d)$[L^{1/2}T^{1/2}]$

6. The dimension of $\frac{1}{2}\varepsilon_0 E^2$, where ε_0 is permittivity of free space and E is electric field, is

(a) ML^2T^{-2}

(b) $ML^{-1}T^{-2}$

(c) $ML^{2}T^{-1}$

(d) MLT^{-1}

7. If the dimensions of a physical quantity are given by $M^{a}L^{b}T^{c}$, then the physical quantity will be

(a) Velocity if a=1, b = 0, c = -1

(b) Acceleration if a = 1, b= 1, c = -2

(c) Force if a= 0, b = - 1, c= -2

(d) Pressure if a = 1, b = -1, c = -2

8. Which two of the following five physical parameters have the same dimensions?

1. Energy density 2. Refractive index

3. dielectric constant 4. Young's modulus

5. Magnetic field

(a) 1 and 4

(b) 1 and 5

(c) 2 and 4

(d) 3 and 5

9. The velocity v of a particle at time t is given by $v = at + \frac{b}{t+c}$ where a, b and c are constants

(a) [L],[LT]and[LT^{-2}]

(b) [LT^{-2}],[L]and[T]

(c) [L^{2}],[T]and[LT^{-2}]

(d) [LT-2],[LT]and[L]

10. The dimension of universal gravitational constant are

(a) [$M^{-1}L^{3}T^{2}$]

(b) [$ML^{2}T^{-1}$]

(c) [$M^{-2}L^{3}T^{-2}$]

(d) [$M^{-2}L^{2}T^{-1}$]

11. A particle moves along a straight line OX. At a time (t in seconds) the distance x (in metres) of the particle O from is given by $x = 40 + 12t - t^{3}$ How long would the particle travel before coming to rest?

(a) 16 m

(b) 24 m

(c) 40m

(d) 56 m

12. The displacement x of a particle varies with time t as $x = ae^{-\alpha t} + be^{\beta t}$ where a, b, α and β and are positive constants. The velocity of the particle will

(a) Be independent of β

(b) Drop to zero when α = β

(c) Go on decreasing with time

(d) go on increasing with time.

13. If a ball is thrown vertically upwards with speed u, the distance covered during the last 't' Seconds of its ascent is

(a) ut

(b) (b) $\frac{1}{2}gt^{2}$

(c) (c) ut - $\frac{1}{2}gt^2$

(d) (d) (u + gt) t

14. Motion of a particle is given by equation s = ($3t^3$ + $7t^2$+14t +8) m. The value of

Acceleration of the particle at t = 1 sec is

(a) 10 m/s^2

(b) 32 m/s^2

(c) 23 m/s^2

(d) 16 m/s^2

15. A rubber ball is dropped from a height of m on a plane. On bouncing it rises to 1.8 The hall loses its velocity on bouncing by a factor of

(a) $\frac{3}{5}$

(b) $\frac{2}{5}$

(c) $\frac{16}{25}$

(d) $\frac{9}{25}$

16. If a car at rest accelerates uniformly to a speed of 144 km/h in 20 sec, it covers a distance of

(a) 1440 cm

(b) 2980 cm

(c) 20 m

(d) 400 m.

17. The acceleration of a particle is increasing linearly with lime t as bt. The particle starts from orgin with an initial velocity v_0The distance travelled by the the particle in time t will be

(a) $v_0t + \frac{1}{3}bt^2$

(b) $v_0t + \frac{1}{2}bt^2$

(c) $v_0t + \frac{1}{6}bt^3$

(d) $v_0t + \frac{1}{3}bt^3$

18. A car accelerates from rest at a constant rate α for some time after which it decelerates at a Constant rate β and comes to rest. If total time elapsed is t. then maximum velocity acquired by car will be.

(a) $\frac{(\alpha 2-\beta 2)t}{\alpha\beta}$

(b) $\frac{(\alpha 2+\beta 2)t}{\alpha\beta}$

(c) $\frac{(\alpha+\beta)t}{\alpha\beta}$

(d) $\frac{\alpha\beta t}{\alpha+\beta}$

19. The velocity of train increases uniformly from 20 km/h in 4hours.The distance travelled by the train during this period is

(a) 160km

(b) 180km

(c) 100km

(d) 120 km

20. A body starts from rest, what is the ratio of the distance travelled by the during the 4th and 3rd second

(a) $\frac{7}{5}$

(b) $\frac{5}{7}$

(c) $\frac{7}{3}$

(d) $\frac{3}{7}$

21. A man is slipping a frictionless inclined plane and a hag falls down from the same the velocity of both is related as

(a) $V_B > V_M$

(b) $V_B < V_M$

(c) $V_B = V_M$

(d) V_B and V_M can't be related

22. A person aiming to reach exactly opposite point on the bank of a stream is swimming with a speed of 0.5 m/s at an angle of 120^0 with the direction of flow of water. The speed of water in the stream. is

(a) 0.25 m/s

(b) 0.5 m/s

(c) m/s

(d) 0.433 m/s

23. If a unit vector is represented by $0.5\hat{\imath} - 0.8\hat{\jmath} + c\hat{k}$ then the value of c is

(a) $\sqrt{0.01}$

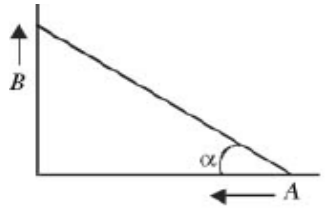
(b) $\sqrt{0.11}$

(c) 1

(d) $\sqrt{0.39}$

24. Two particles A and B are connected by a rigid rod AB. The rod slides along perpendicular rails as shown here. The velocity of A to the left is 10 m/s. What is the

Velocity of B when angle $\alpha = 60^0$?



(a) 10ms (b) 9.8m/s

(c) 5.8m/s (d) 17.3m/s

25. Identify the vector quantity among the following

(a) distance

(b) angular momentum

(c) heat

(d) energy

26. The position vector of a particle is $\hat{r} = (a\ cos\omega t)\ \hat{\imath} + (a\sin\omega t)\hat{\jmath}$ the velocity particle is

(a) directed towards the origin

(b) directed away from_ the origin

(c) parallel to the position vector

(d) perpendicular to the position vector

27. The angle between the two vectors $\hat{A} = 3\hat{\imath} + 4\hat{\jmath} + 5\hat{k}$ and $\hat{B} = 3\hat{\imath} + 4\hat{\jmath} - 5\hat{k}$ will be

(a) 90°

(b) 180^0

(c) zero

(d) 45^0

28. If a body A of mass M is thrown with velocity v an angle of 30^0 to the horizontal and another body B of the same mass is thrown with the same speed at an angle of 60^0 to the horizontal, the ratio of horizontal range of A to B via be

(a) 1:3

(b) 1:1

(c) $1:\sqrt{3}$

(d) $\sqrt{3}:1$

29. An electric fan has blades of length 30 cm measured from the axis of rotation. If the fan is rotating at 120 rpm, the acceleration of a point on the tip of the blade is

(a) 1600 m S^{-2}

(b) 47.4 mS^{-2}

(c) 23.7 mS^{-2}

(d) 50.55 mS^{-2}

30. A bus is moving on a straight road towards north with a uniform speed or 50 km/hour then it turns left through 90^0. If the speed remains unchanged after turning, the increase in the velocity of bus in the turning process is

(a) 70.7 km/hr along south-west direction

(b) zero

(c) 50 km/hr along west

(d) 70.7 km/hr -along north-west direction

31. Which one of the following pairs of nuclei are isotones?

(a) $_{34}Sc^{74}$, $_{31}Ga^{71}$

(b) $_{38}Sr^{84}$, $_{38}Sr^{86}$

(c) $_{42}MO^{92}$, $_{40}Zr^{92}$

(d) $_{20}Ca^{40}$,$_{16}S^{32}$

32. Energy levels A, B and C of a certain atom corresponding to increasing values of energy i.e. $E_A < E_B < E_C$. if $\lambda_1\lambda_2\lambda_3$ are wavelengths of radiations corresponding to Transitions C to B. B to A and C to A respectively. Which of the following relations is correct'?

(a) $\lambda_3 = \lambda_1 + \lambda_2$

(b) $\lambda_3 = \frac{\lambda 1 \lambda 2}{\lambda 1 + \lambda 2}$

(c) $\lambda_1 + \lambda_2 + \lambda_3 = 0$

(d) $\lambda_3^2 = \lambda_1^2 + \lambda_2^2$

33. A nucleus represented by the symbol ^{A}z x- has

(a) Z neutrons and A - Z protons

(b) Z protons and A - Z neutrons

(c) Z protons and A neutrons

(d) A protons and Z - A neutrons

34. The Bohr model of atoms

(a) Assumes that the angular momentum of electrons is quantized.

(b) Uses Einstein's photoelectric equation.

(c) Predicts continuous emission spectra for atoms.

(d) Predicts the same emission spectra for all types of atoms.

35. An electron is moving round the nucleus of a hydrogen' atom in a circular orbit of radius ‘r’. The Coulomb force $\vec{F}$ between the two is

(a) K $\frac{e2}{r2}\hat{r}$(Where K = $\frac{1}{4\pi\varepsilon 0}$)

(b) -K $\frac{e2}{r3}\hat{r}$

(c) K $\frac{e2}{r3}\vec{r}$

(d) -K $\frac{e2}{r3}\vec{r}$

36. The volume occupied by an atom is greater than the volume of the nucleus by a factor of about

(a) 10^1

(b) 10^5

(c) 10^{10}

(d) 10^{15}

37. In which of the following systems will the radius of the first orbit (n = 1) be minimum?

(a) doubly ionized lithium

(b) singly ionized helium

(c) deuterium atom

(d) Hydrogen atom

38. The mass number of a nucleus is

(a) always less than its atomic number

(b) always more than its atomic number

(c) sometimes equal to its atomic number

(d) sometimes less than and sometimes more than its atomic number

39. Which of the following are suitable for the fusion process?

(a) Light nuclei

(b) Heavy nuclei

(c) Element lying in the middle of the periodic. Table

(d) Middle elements, which are lying on binding energy curve

40. A Deuteron is bombarded on gO^{16} nucleus then α-particle is emitted. The product nucleus is

(a) $_7N^{13}$

(b) $_5B^{10}$

(c) $_4Be^9$

(d) $_7N^{14}$

41. In forward bias, the width of potential barrier in a p-n junction diode

(a) remains constant
(b) decreases
(c) increases
(d) first (a) then (b)

42. In a junction diode, the holes are due to

(a) extra electrons
(b) neutrons
(c) protons
(d) Missing of electron's

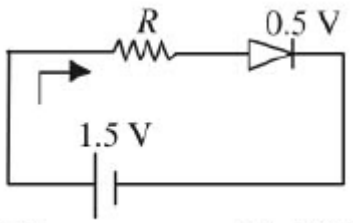
43. The cause of the potential barrier in a p-n diode

(a) Depletion of negative charges near the junction
(b) Concentration of positive charges near the junction
(c) Depletion of positive charges near the junction
(d) Concentration of positive and negative charges near the junction

44. The transfer ratio β of a transistor is 50. The input resistance of the transistor when used in the common-emitter configuration is 1 kΩ. The peak value of the. collector A.C. current for an A.C. input voltage of 0.01V peak is

(a) 0.25 mA
(b) 0.01 mA
(c) 100μA
(d) 500 μA

45. The diode used in the circuit shown in the figure has a constant voltage drop at 0.5 V at all currents and a maximum power rating of 100 milli watts. What should be the value of the resistor R, connected in series with diode for obtaining maximum current?



(a) 6.76 Ω
(b) 20Ω
(c) 5Ω
(d) 5.6Ω

46. The following truth-table belongs to which One of the following four gates?

A	B	Y
1	1	0
1	0	0
0	1	0
0	0	1

(a) XOR
(b) NOR
(c) OR
(d) NAND

47. When npn transistor is used as an amplifier, then

(a) electrons move from collector to base
(b) holes move from base to emitter

(c) electrons move from base to collector
(d) electrons move from emitter to base

48. When using a triode, as an amplifier, the Electron are emitted by
(a) grid and collected by cathode only
(b) cathode and collected by the anode only
(c) anode and collected by cathode only
(d) anode and collected by the grid and by cathode

49. Distance between body centred atom and a corner atom in sodium (a = 4.225 A) is
(a) 2.99 A
(b) 2.54 A
(c) 3.66 A
(d) 3.17 A.

50. Diamond is very hard because
(a) it is covalent solid
(b) it has large cohesive energy
(c) high melting point
(d) insoluble in all solvents