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Q.1. A body is moving in a circular path with acceleration \( a \). If its velocity gets doubled then find the ratio of acceleration after and before the change of velocity?

(A) 1:4  
(B) 1:2  
(C) 2:1  
(D) 4:1

Ans : D

Q.2. Weightlessness of an astronaut moving in a satellite is a situation of -

(A) Zero velocity  
(B) No gravity  
(C) Zero mass  
(D) Free fall

Ans : D

Q.3. For which of the following metals, the resistance decreases on increasing the temperature?

(A) Copper  
(B) Tungsten  
(C) Germanium  
(D) Aluminium

Ans : C

Q.4. What is the angle of dip at magnetic poles of earth?

(A) Zero  
(B) 45°  
(C) 90°  
(D) 180°

Ans : C

Q.5. A charge moves in a circle perpendicular to a magnetic field. Upon which of the following, the time period of revolution, does not depend?

(A) Magnetic field  
(B) Charge  
(C) Mass of the particle  
(D) Velocity of the particle

Ans : D

Q.6. Atomic number of a nucleus is \( Z \) and atomic mass is \( M \). Find the number of neutrons.

(A) \( M-Z \)  
(B) \( M \)  
(C) \( Z \)  
(D) \( M+Z \)

Ans : A

Q.7. The electrical circuit, used to get smooth dc output from a rectifier circuit is called ______.

(A) Oscillator  
(B) Filter  
(C) Amplifier  
(D) Logic gate

Ans : B
Q.8. Two bodies of 2 Kg & 4 Kg are moving with velocities 20 m/s and 10 m/s respectively towards each other under mutual gravitational attraction. Find the velocity of their centre of mass in m/s.
(A) 5 (B) 6 (C) 8 (D) \(\text{Zero} / \text{Zero}\)
Ans : D

Q.9. The radius of gyration of a solid sphere of radius \(r\) about a certain axis is \(r\). Find the distance of this axis from the centre of the sphere.
(A) \(r\) (B) \(0.5r\) (C) \(\sqrt{4}r\) (D) \(2\sqrt{2}r\)
Ans : C

Q.10. Which of the following statements is correct, in case of adiabatic expansion?
(A) \(\Delta U = 0\) (B) \(\Delta U = \text{positive} / \text{negative}\)
(C) \(\Delta U = \text{maximum} / \text{minimum}\) (D) \(\Delta W = 0\)
Ans : B

Q.11. The velocity of a particle, executing S.H.M, is at its mean position.
(A) \(\text{maximum}\) (B) \(\text{minimum}\)
(C) \(\text{infinity}\) (D) \(\text{zero}\)
Ans : A

Q.12. A coil of an area \(2 \text{ m}^2\) is placed in a magnetic field which changes from 4 Wb/m\(^2\) to 8 Wb/m\(^2\) in 2 seconds. Find the induced e.m.f. in the coil.
(A) 4 V (B) 5 V (C) 6 V (D) 7 V
Ans : A

Q.13. The process by which an alternating current is converted into direct current is called ___.
(A) \text{Purification} / \text{Rectification} (B) \text{Amplification} / \text{Amplification}
(C) \text{Rectification} / \text{Rectification} (D) \text{Current amplification} / \text{Current amplification}
Ans : C

Q.14. If the threshold wavelength for photoelectric effect on sodium metal is 5000 A\(^0\) then find its work function.
(A) 15 J (B) \(4\times10^{-19} J\) (C) \(4\times10^{-14} J\) (D) \(4\times10^{-22} J\)
Ans : B
Q.15. Through which mode of wave propagation, are the radio waves sent from one place to another?
(A) भू तरंग संचरण / ground wave propagation
(B) व्योम तरंग संचरण / sky wave propagation
(C) अंतरिक्ष तरंग संचरण / space wave propagation
(D) उपरोक्त सभी / all of the above
Ans : D

Q.16. What is the wavelength range of visible light?
(A) $4\times10^{-7} m - 8\times10^{-7} m$
(B) $4\times10^{-6} m - 8\times10^{-8} m$
(C) $4\times10^{-9} m - 8\times10^{-9} m$
(D) $4\times10^{-10} m - 8\times10^{-10} m$
Ans : A

Q.17. What is the dimensional formula for the universal gravitational constant?
(A) $M^{-1}L^2T^{-2}$
(B) $M^{-1}L^1T^{-1}$
(C) $M^{-1}L^2T^{-2}$
(D) $M^0L^0T^0$
Ans : A

Q.18. Two balls are dropped from heights h and 2h respectively. What would be the ratio of times taken by the balls to reach the earth?
(A) $\sqrt{2}:1$
(B) $1:\sqrt{2}$
(C) 2:1
(D) 4:1
Ans : B

Q.19. When a spring is stretched by 2 cm, the energy stored is 100 J. If it is stretched further by 2 cm, its energy increases by _______.
(A) 300
(B) 400
(C) 200
(D) 100
Ans : A

Q.20. At what temperature, will the surface tension of water, be minimum?
(A) $0^\circ C$
(B) $25^\circ C$
(C) $60^\circ C$
(D) $75^\circ C$
Ans : D

Q.21. Diameters of 2 water drops are 1cm and 1.5 cm respectively. Find the ratio of excess pressures inside them.
(A) 1:1
(B) 5:3
(C) 3:2
(D) 2:3
Ans : C
Q.22. Young’s double slit experiment using sodium light ($\lambda = 5898$ Å), 92 fringes are seen. If another colour ($\lambda = 5461$ Å) is used then find the number of fringes.

(A) 62  (B) 99  (C) 67  (D) 85

Ans : B

Q.23. Two plates are at potentials -10V & +30V. If the separation between the plates is 2 cm then find the electric field between them.

(A) 2000 V/m  (B) 1000 V/m  (C) 500 V/m  (D) 3000 V/m

Ans : A

Q.24. If red light is replaced by blue light illuminating the object in a microscope, the resolving power of the microscope ________.

(A) will decrease  (B) will increase  (C) will get halved  (D) will remain unchanged

Ans : B

Q.25. In gases of diatomic molecules, Find the ratio of the two specific heat of gases $\frac{C_p}{C_v}$.

(A) 1.66  (B) 1.33  (C) 1.4  (D) 1.00

Ans : C