PHYSICS

BOOKS - SARAS PUBLICATION

MODEL QUESTION PAPER 6

Exercise

1. A radioactive source of halflife 2 h emits radiation of intensity which is 64 times the permissible safe level. The minimum time in

hours after which it would be possible to work safely with the source is:

A. 12

B. 8

C. 6

D. 24

Answer:

2. Nuclear fusion is not found in:

A. thermonuclear reactor

B. hydrogen bomb

C. energy production in sun

D. atom bomb

Answer:

3. a. Give the expression for the radius of a nucleus.

b. What is the ratio of the nuclear radii of $^{197}_{79}Au$ and $^{107}_{47}Ag$?

c. What is the ratio of their nuclear densities ?

   A. $197 : 107$

   B. $47 : 79$

   C. $79 : 47$

   D. $1 : 1$

Answer:

4. Complete the diagram.
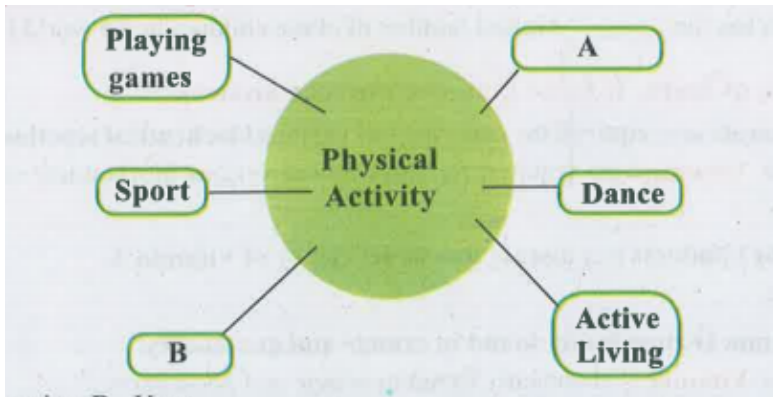
A. AND

B. OR

C. NAND

D. NOR

Answer:

5. Acceptor level in p-type semiconductor lies:

A. nearer to the conduction band

B. at the middle of conduction band and valence band

C. within the valence band

D. nearer to the valence band

Answer:

6. The frequencies that are reflected are transmitted at ionospheric layer respectively are:

    A. 3 kHz and 10 MHz

    B. 10MHz and 40 MHz

    C. 10 MHz and 20 Mtlz

    D. 36 MHz and 70 MHz

Answer:

7. The gap between the frequency of the side bands in an amplitude modulated wave is:

    A. twice that of the carrier signal

    B. twice that of the message signal

    C. the same as that of the message signal

    D. the same as that of the carrier signal

Answer:

8. A transmitting antenna at the top of a tower has a height 32 m and that of the receiving antenna is 100 m. What is the maximum distance between them for satisfactory communication in LOS mode? Given radius of earth 6.4×10^6 m

A. 30 m

B. 36 m

C. 40 m

D. 46 m

Answer:

9. The wrong unit-conversion among the following is:

A. $1 angstrom = 10^{-10} m$

B. $1 fermi = 10^{-15} m$

C. $1 lightyear = 9.46 x 10^{15} m$

D. astronomical unit = 1.496 x 10^(-11) m`

Answer:

▶ **Watch Video Solution**

10. Choose the wrong statement

A. The motion of an object along a straight

line is a rectilinear motion .

B. The speed in general is less than the magnitude of the velocity:

C. The slope of the displacement time graph gives the velocity of the body
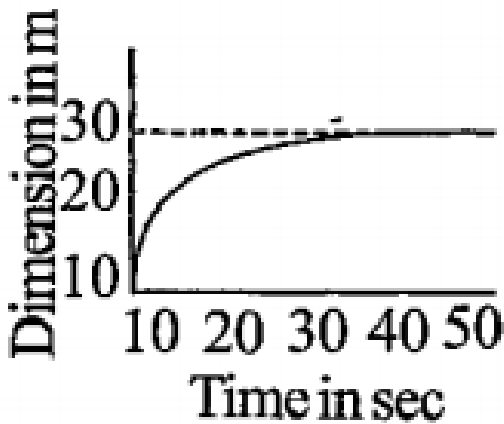
D. The area under the velocity-time graph gives the displacement of the body

Answer:

11. The displacement of a particle as a function of time is shown in figure. It indicates that:

A. the velocity of the particle is constant throughout

B. the acceleration of the particle is constant throughout

C. the particle starts with a constant

velocity and is accelerated

D. the motion is retarded and finally the

particle stops

Answer:

> ▶ **Watch Video Solution**

12. The range of a projectile is R when the

angle of projection is$30°$. For the same

velocity of projection and range the other possible angle of projection is:

A. $45°$

B. $50°$

C. $60°$

D. $40°$

Answer:

▶ Watch Video Solution

13. The scalar quantity among the following is:

A. weight of body

B. temperature gradient

C. elementary area

D. electric potential

Answer:

14. Which one of the following motions on a smooth plane surface does not involve force?

A. Accelerated motion in a straight line

B. Retarded motion in a straight line

C. Motion with constant momentum along a straight line

D. Motion along a straight line with varying velocity

Answer:

15. Pick out the wrong statement :

A. Newton's laws of motion hold good for both inertial and non-inertial frames

B. During explosion, linear momentum is conserved

C. Area under force-time graph gives the magnitude of impulse

D. Force of friction is zero when no driving

force is applied

Answer:

---

16. Two bodies of masses 3m and 9m are moving with equal kinetic energies. The ratio of linear momenta is:

A. masses

B. square of masses

C. square root of masses

D. cube root of masses

Answer:

▶ **Watch Video Solution**

17. Two bodies of masses 1 kg and 2 kg moving with same velocities are stopped by the same force. Then, the ratio of their stopping distances is:

A. $1:2$

B. $2:1$

C. $\sqrt{2}:1$

D. $1:\sqrt{2}$

Answer:

18. If two circular discs A and B are of same mass but of radii r and 2r respectively, then the moment of inertia of A is:

A. the same as that of B

B. twice that of B

C. four times that of B

D. One-forth that of B

Answer:

▶ **Watch Video Solution**

19. Choose the wrong statement

A. The centre of mass of a uniform circular ring is at its geometric centre

B. Moment of inertia is a scalar quantity

C. Radius of gyration is a vector quantity:

D. For same mass and radius,the moment of inertia of a ring is twice that of a uniform disc:

Answer:

20. Orbital velocity of earth satellite does not depend on:

A. mass of the earth

B. mass of the satellite

C. radius of the earth

D. acceleration due to gravity

Answer:

▶ Watch Video Solution

21. Gravitational potential energy of a body of mass m at a height of h above the surface of earth (M = mass of earth,.R = radius of earth) is:

A. $GM\dfrac{m}{R+h}$

B. $-G\dfrac{m}{R+h}$

C. $G\dfrac{m}{R+h}$

D. $-GM\dfrac{m}{R+h}$

Answer:

22. A boat carrying a few number of big stones floats in a water tank. If the stones are unloaded into water, the water level:

A. rises till half the number of stones are unloaded and then begins to fall

B. remains unchanged

C. rises

D. fall till half the number of stones are unloaded and then begins to rise

Answer:

---

23. Two wires of same length and same material but ofradii r and 2r are stretched by forces F and f respectively to produce equal elongation. The ratio F to f is:

    A. $1:1$

    B. $1:2$

    C. $2:1$

D. $4 : 1$

Answer:

24. Choose the correct statement

A. Terminal velocities of rain drops are proportional to square of their radii

B. Water proof agents decrease the angle of contact between water and fibres

C. Detergents increase the surface tension of water

D. Hydraulic machines work on the principle of Torricelli's law:

Answer:

▶ **Watch Video Solution**

25. If ΔU represents the increase in internal energy and W the work done by the thermodynamic system, then:

A. Δ U = - W is an isothermal process

B. ΔU = W is an isothermal process

C. ΔU= -W is an adiabatic process

D. ΔU=W is an adiabatic pro   cess

Answer:

> ▶ **Watch Video Solution**

26. If the energy input to a Carnot engine is thrice work it performs then, the fraction of energy rejected to the sink is:

A. $1/3$

B. $1/4$

C. $2/5$

D. $2/3$

Answer:

▶ **Watch Video Solution**

27. The ratio of rms speed of an ideal gas molecules at pressure p to that at pressure 2p is:

A. $1:2$

B. $2:1$

C. $1:\sqrt{2}$

D. $\sqrt{2}:1$

Answer:

▶ **Watch Video Solution**

28. A pendulum of time period 2 s'on earth is taken to another planet whose mass and

diameter are twice that of earth.Then, its time period of the planet is (in second):

A. $1/2$

B. $2\sqrt{2}$

C. $1/\sqrt{2}$

D. 2

Answer:

29. The physical quantity which remains constant in simple harmonic motion is :

A. kinetic energy

B. potential energy

C. restoring force

D. frequency

Answer:

▶ **Watch Video Solution**

30. transverse waves:

A. can be polarized

B. can exhibit diffraction

C. are transverse in nature

D. can travel in free space

Answer:

▶ **Watch Video Solution**

31. If a closed organ pipe has the same third harmonic frequency as that of an open organ pipe, then their respective lengths are in the ratio:

A. $1:1$

B. $1:2$

C. $1:4$

D. $3:4$

Answer:

32. A particle of mass $1.96 \times 10^{-15} kg$ is kept in equilibrium between two horizontal metal plates having potential difference of 400 V separated apart by 0.02 m. Then, the charge on the particle is (e = electronic charge)

A. 3e

B. 6e

C. 2e

D. 5e

Answer:

33. Two small spherical shells A and B are given positive charges of 9 C and 4 C respectively and placed such that their centres are separated by 10 m. If P is a point in between them where the electric field intensity is zero, then the distance of the point P from the centre of A is:

A. 5m

B. 6m

C. 7m

D. 8m

Answer:

▶ **Watch Video Solution**

34. Identify the wrong statement.

A. Charge is a vector quantity

B. Current is a scalar quantity

C. Charge can be quantised

D. Charge is additive in nature

Answer:

▶ **Watch Video Solution**

35. When the rate of flow of charge through a metallic conductor of non-uniform cross section is uniform, then the quantity that remains constant along the:

A. current density

B. electric field

C. Electric potential

D. current

Answer:

36. The resistance of a carbon resistor of colour code Red Red Green Silver is (in $kohm$)

A. $2200 \pm 5\%$

B. $2200 \pm 10\%$

C. $200 \pm 10\%$

D. $220 \pm 5\%$

Answer:

▶ **Watch Video Solution**

37. The slope of the graph showing the variation of potential difference V on x axis and current on y axis gives conductor's:

A. resistance

B. resistivity

C. reciprocal of resistance

D. conductivity

Answer:

▶ **Watch Video Solution**

38. When the temperature of a magnetic material decreases, the magnetization:

A. decreases in a diamagnetic material

B. decreases in a paramagnetic material

C. decreases in a ferromagnetic material

D. remains the same in a diamagnetic material

Answer:

39. The magnetic field at the centre of a circular coil carrying current I-ampere is B. If the coil bent into smaller circular coil of n turns, its magnetic field at the centre is B. The ratio between B' and B is:

A. $1:1$

B. $n:1$

C. $n^2:1$

D. $2n:1$

Answer:

40. In an LCR series resonant circuit, the capacitance is changed from C and 4C. For the same resonant frequency,the inductance should be changed from L to:

A. 2L

B. $L/2$

C. 4L

D. $L/4$

Answer:

41. Changing magnetic fields can set up current loops in nearby metal bodies and the currents are called as:

A. eddy currents

B. flux currents

C. alternating currents

D. leaking currents

Answer:

▶ **Watch Video Solution**

---

42. Ozone layer in atmosphere is useful, because it

    A. radio waves

    B. infrared waves

    C. ultraviolet rays

    D. X-rays

Answer:

---

43. The magnifying power of a convex lens of focal length 10 cm when the image is formed at the near point is:

A. 6

B. 5.5

C. 4

D. 3.5

Answer:

---

44. The waves that require a medium to travel is:

    A. infrared radiation

    B. ultraviolet radiation

    C. visible light

    D. Ultra sound

Answer:

45. In Youngs double slit experiment, to increase the fringe width

    A. a hyperbola

    B. a straight line

    C. an ellipse

    D. a parabola

Answer:

▶ Watch Video Solution