

# JAMB

## Physics

### Past questions

*Paper Type:* **Objective (PT. 1-5)**

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## JAMB PHYSICS PAST QUESTIONS (PT.1)

### PAPER TYPE: C

1. Which Question Paper Type of Physics is given to you?

- A. Type A
- B. Type B
- C. Type C
- D. Type D.

2. A carpenter on top of a roof 20.m high dropped a hammer of mass 1.5kg and it fell freely to the ground. The kinetic energy of the hammer just before hitting the ground is \_\_\_\_\_ [ $g = 10\text{ms}^{-2}$ ]

- A. 450 J
- B. 600 J
- C. 150 J
- D. 300 J

3. Two balls X and Y weighing 5g and 50kg respectively were thrown up vertically at the same time with a velocity of  $100\text{ms}^{-1}$ . How will their positions be one second later?

A. X and Y will both be 500m from the point of throw

B. X and Y will be 500m from each other

C. Y will be 500 m ahead of X

D. X will be 500m ahead of Y.

4. A man standing on a lift that is descending does not feel any weight because \_\_\_\_\_

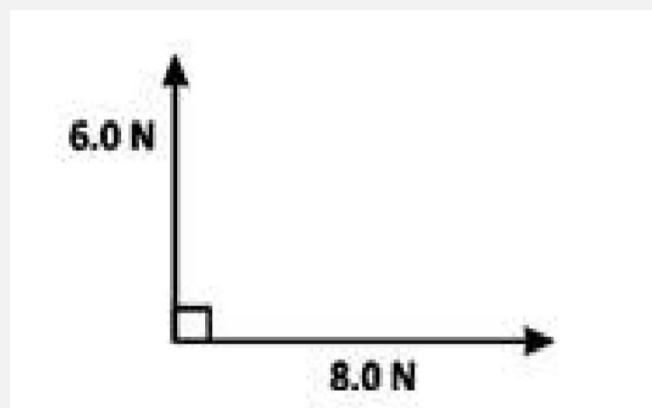
A. there is no gravitational pull on the man in the lift

B. the inside of the lift is air tight

C. the lift is in vacuum

D. there is no reaction from the floor of the lift.

5.



The diagram above shows two vectors at right angles to each

other. The value of the resultant vector is \_\_\_\_\_

- A. 13.0 N
- B. 14.0 N
- C. 10.0 N
- D. 12.0 N.

6. An object of mass 2kg moves with a velocity of  $10\text{ms}^{-1}$  round a circle of radius 4m. Calculate the centripetal force on the object.

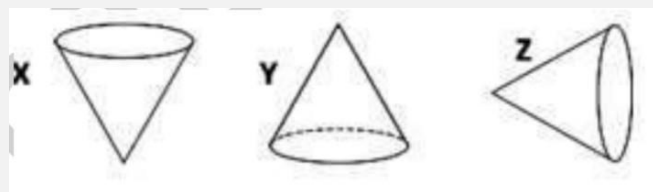
- A. 40 N
- B. 25 N
- C. 100 N
- D. 50 N

7. If it takes an object 3s to fall freely to the ground from a certain height, what is the distance covered by the object?

[ $g = 10\text{ms}^{-2}$ ]

- A. 60 m
- B. 90 m
- C. 30 m
- D. 45 m.

8.



The diagrams above show the positions of a cone. The position which can be described as neutral equilibrium is represented as \_\_\_\_\_

- A. Y and X
- B. Z only
- C. X only
- D. Y and Z.

9. If a tube of small radius opened at both ends is placed in a liquid, the liquid will \_\_\_\_\_

- A. rise above the liquid level if the liquid does not wet the glass
- B. remain at the same level irrespective of whether the liquid wets the glass or not
- C. fall below the liquid level if the liquid wets the glass
- D. fall below the liquid level if the liquid does not wet the glass.

10.

**I. Density of the liquid**

**II. Depth below the surface of the liquid**

**III. Surface area of the liquid**

In which of the statement above will pressure be dependent?

- A. **I** and **III** only
- B. **I** and **II** only
- C. **II** and **III** only
- D. **I, II** and **III**.

11.

**I. High thermal capacity**

**II. High sensitivity**

**III. Easy readability**

**IV. Accuracy over a wide range of temperatures**

From the statements above, the qualities of a good thermometer are

- A. **II, III** and **IV**
- B. **I** and **II**
- C. **I, II, III** and **IV**
- D. **I, III** and **IV**

12. A machine is used to lift a load of 20 N through a height of 10m. If the efficiency of the machine is 40%, how much work is done?

- A. 120 J
- B. 80 J
- C. 500 J
- D. 300 J.

13. Which of the following could be effectively used to reduce friction?

- A. Petrol
- B. Kerosene
- C. Grease
- D. Water.

14. A copper wire was subjected to a tensile stress of  $7.7 \times 10^7 \text{ Nm}^{-2}$ . Calculate the tensile strain of the wire. [Young modulus =  $1.1 \times 10^{11} \text{ Nm}^{-2}$ ]

- A.  $2.2 \times 10^{-4}$
- B.  $2.0 \times 10^{-5}$
- C.  $7.0 \times 10^{-3}$

D.  $7.0 \times 10^{-4}$

15. An object weighs 22kg in water and 30kg in air. What is the up thrust exerted by the liquid on the object? [ $g = 10 \text{ ms}^{-2}$ ]

- A. 80 N
- B. 50 N
- C. 520 N
- D. 220 N.

16. A block of aluminium is heated electrically by a 30 W heater. If the temperature rises by  $100^\circ\text{C}$  in 5 minutes, the heat capacity of the aluminium is \_\_\_\_\_

- A.  $200 \text{ JK}^{-1}$
- B.  $900 \text{ JK}^{-1}$
- C.  $90 \text{ JK}^{-1}$
- D.  $100 \text{ JK}^{-1}$

17. A perfect emitter or absorber of radiant energy is a \_\_\_\_\_

- A. red body
- B. conductor
- C. black body

D. white body.

18. The phenomenon that shows that increase in pressure lowers the melting point can be observed in \_\_\_\_\_

- A. regelation
- B. sublimation
- C. condensation
- D. coagulation.

19. If the volume of a gas increases steadily as the temperature decreases at constant pressure, the gas obeys \_\_\_\_\_

- A. Charles' law
- B. Graham's law
- C. Boyle's law
- D. pressure law.

20. Steam burn is more severe than that of boiling water because \_\_\_\_\_

- A. steam burn is dependent on relative humidity

- B. steam burn is independent of relative humidity
- C. steam possess greater heat energy per unit mass
- D. water boils at a higher temperature

21. Which of the following types of waves needs a medium for propagation?

- A. X-rays
- B. Sound waves
- C. Light waves
- D. Radio waves.

22. The ground is always cold at night because the \_\_\_\_\_

- A. atmosphere reflects the sun's energy at night
- B. atmosphere absorbs the sun's energy at night
- C. earth radiates heat to the atmosphere at night
- D. sun no longer shines at night

23. A metal of volume  $40\text{cm}^3$  is heated from  $30^\circ\text{C}$  to  $90^\circ\text{C}$ , the increase in volume is \_\_\_\_\_

[Linear expansivity of the metal =  $2.0 \times 10^{-5}\text{K}^{-1}$ ]

- A.  $0.40\text{cm}^3$
- B.  $0.14\text{cm}^3$
- C.  $0.12\text{cm}^3$
- D.  $1.20\text{cm}^3$

24.

**I. Change of state**

**II. Diffusion**

**III. Radiation**

**IV. Osmosis**

Which of the processes above can be explained using the kinetic theory?

- A. **I, II and IV**
- B. **I, II, III and IV**
- C. **I, II and III**
- D. **I, III and IV.**

25. When the human eye loses its power of accommodation, the defect is known as \_\_\_\_\_

- A. long-sightedness
- B. short-sightedness
- C. presbyopia
- D. astigmatism

26. A length of wire has a frequency of 255Hz when stretched by a force of 225 N. If the force increases to 324 N, what is the new frequency of vibration?

- A. 356 Hz
- B. 306 Hz
- C. 512 Hz
- D. 488 Hz.

27. A certain far-sighted person cannot see objects that are closer to the eye than 50cm clearly. Determine the power of the converging lens which will enable him to see at 25cm.

- A. 0.04 D
- B. 0.06 D
- C. 0.02 D
- D. 0.03 D.

28. Which of the following electromagnetic waves has the highest frequency?

- A. X-rays
- B. Ultra-violet rays
- C. Radio waves
- D. Infrared-rays.

29. When a red rose flower is observed in blue light, what colour does the observer see?

- A. Yellow
- B. Red
- C. Blue
- D. Magenta.

30. The eclipse of the sun occurs when the \_\_\_\_\_

- A. moon's umbra falls on some part of the earth
- B. moon is between the sun and the earth
- C. earth is between the sun and the moon
- D. moon is not completely hidden in the earth's shadow.

31. A cannon is fired from town X. After how long is the sound heard at a town Y 4.95 km away?

[velocity of sound in air =  $333 \text{ ms}^{-1}$ ]

- A. 15 s
- B. 0 s
- C. 10 s
- D. 12 s

32. An image in a convex lens is upright magnified 3 times. If the focal length of the lens is 15cm, what is the object distance?

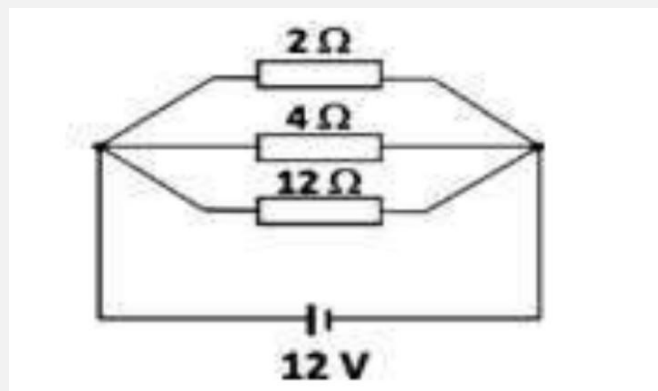
- A. 14 cm
- B. 10cm
- C. 25 cm
- D. 26cm.

33. The capacitance of a parallel plate capacitor is  $20 \mu\text{F}$  in air and  $60 \mu\text{F}$  in the presence of a dielectric. What is the dielectric constant?

- A. 2.0
- B. 0.3

- C. 6.0
- D. 3.0.

34. In the circuit below, three resistors,  $2\Omega$ ,  $4\Omega$  and  $12\Omega$  are connected in parallel and a 12 V battery is connected across the combination. The current flowing through the  $12\Omega$  resistor is \_\_\_\_\_



- A. 9.6 A
- B. 14.4 A
- C. 1.0 A
- D. 3.2 A.

35. If the charge of electricity per kWh is N4, what is the cost of operating an electrical appliance rated 2.50 V, 2 A for 6 hours?

- A. ₦24
- B. ₦0.12



C. #12

D. #16.

36. The correct expression for the potential at a point, distance  $r$  from a charge  $q$ , in an electric field is \_\_\_\_\_

A.  $\frac{q}{4\pi\epsilon_0 r^2}$

B.  $\frac{q}{4\pi\epsilon_0 r}$

C.  $\frac{q^2}{4\pi\epsilon_0 r^2}$

D.  $\frac{q^2}{4\pi\epsilon_0 r}$

37. Three similar cells each of e.m.f 2V and internal resistance  $2\ \Omega$  are connected in parallel, the total e.m.f and total internal resistance are respectively \_\_\_\_\_

A. 6 V,  $0.7\ \Omega$

B. 6 V,  $6.0\ \Omega$

C. 2 V,  $0.7\ \Omega$

D. 2 V,  $6.0\ \Omega$

38. In homes, electrical appliances and lamps are

connected in parallel because

\_\_\_\_\_

A. less voltage will be used

B. parallel connection does not heat up the wires

C. series connection uses high voltage

D. less current will be used.

39. Two resistors  $5\ \Omega$  and  $10\ \Omega$  are arranged first in series and later in parallel to a 24 V source. The ratio of total power dissipated in the series and parallel arrangement respectively is \_\_\_\_\_

A. 3:5

B. 5:3

C. 1:50

D. 50:1.

40. Which of the following will be applied when a metal  $x$  in electrolysis?

A.  $Y$  is the anode and very high current is used

- B. X is the anode and very high current is used
- C. X is the cathode and Y is the anode
- D. Y is the cathode and X is the anode

41. A radioactive isotope has a decay constant of  $10^{-5}\text{s}^{-1}$ . Calculate its half-life.

- A.  $6.93 \times 10^4\text{s}$
- B.  $6.93 \times 10^{-6}\text{s}$
- C.  $6.93 \times 10^{-5}\text{s}$
- D.  $6.93 \times 10^5\text{s}$

42. Which of the following is a property of steel?

- A. It can easily be magnetized and demagnetized
- B. It cannot retain its magnetism longer than iron
- C. It can be used for making temporary magnets
- D. It can be used for making permanent magnets

43. If the threshold frequency for tungsten is  $1.3 \times 10^{15}\text{Hz}$ , what is its work function?

- A.  $8.85 \times 10^{-18} \text{ J}$
- B.  $8.58 \times 10^{-19} \text{ J}$
- C.  $8.58 \times 10^{-15} \text{ J}$
- D.  $8.58 \times 10^{-17} \text{ J}$

$$[h = 6.6 \times 10^{-34} \text{ Js}]$$

44. In an a.c. circuit, the ratio of r.m.s value to peak value of current is total power dissipated in the series

- A.  $\frac{1}{\sqrt{2}}$
- B.  $\sqrt{2}$
- C. 2
- D.  $\frac{1}{2}$

45. Two inductors of inductances 4H and 8H are arranged in series and a current of 10A is passed through them. What is the energy stored in them?

- A. 250 J
- B. 500 J
- C. 50 J

D. 133 J.

46. Under which of the following conditions do gasses conduct electricity?

- A. High pressure and high p.d
- B. Low pressure and low p.d
- C. low pressure and high p.d
- D. High pressure and low p.d

47. In measuring high frequency a.c., the instrument used is the \_\_\_\_\_

- A. hot wire ammeter
- B. d.c. ammeter
- C. moving coil ammeter
- D. moving iron ammeter.

48. The bond between silicon and germanium is

- A. electrovalent
- B. covalent
- C. ionic
- D. dative.

49. Which of the following materials has an increase in resistance with temperature?

- A. Electrolyte
- B. Water
- C. Metals
- D. Wood.

50. The electrical properties of germination can be altered drastically by the addition of impurities. The process is referred to as \_\_\_\_\_

- A. doping
- B. saturation
- C. bonding
- D. amplification

## JAMB PHYSICS PAST QUESTIONS (PT.2)

### PAPER TYPE: PURPLE

1. Which Question paper type of physics as indicated above is given to you?

- A. Type Green
- B. Type Purple
- C. Type Red
- D. Type Yellow

2. In order to remove the error of parallax when taking measurements with a metre rule, the eye should be focused \_\_\_\_\_

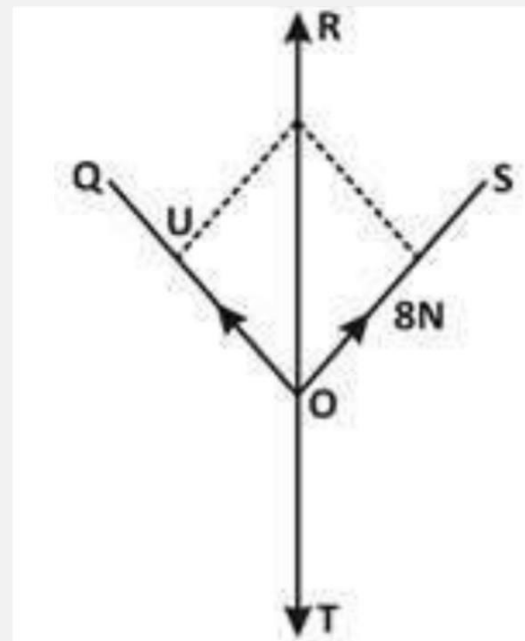
- A. slantingly towards the left on the markings
- B. slantingly towards the right on the markings
- C. vertically downwards on the markings
- D. vertically upwards on the markings.

3. A load is pulled at a uniform speed along horizontal floor by a rope at  $45^\circ$  to floor.

If the force in the rope is 1500N, what is the frictional force on the load?

- A. 1524N
- B. 1350N
- C. 1260N
- D. 1061N

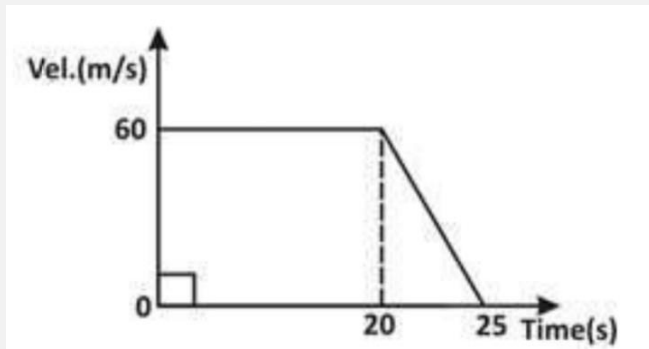
4.



From the diagram above, OT is \_\_\_\_\_

- A. 18N
- B. 14N
- C. 5N
- D. 2N

5.



From the velocity-time graph shown above, which of the following quantities **CANNOT** be determined?

- A. Deceleration.
- B. Initial velocity.
- C. Total distance travelled.
- D. Initial acceleration

6. Calculate the total distance covered by a train before coming to rest if its initial speed is  $30\text{ms}^{-1}$  with a constant retardation of  $0.1\text{ms}^{-2}$ .

- A. 5500m
- B. 4500m
- C. 4200m
- D. 3000m.

7. A car starts from rest and moves with a uniform acceleration of  $30\text{ms}^{-2}$  for 20s. Calculate the distance covered at the end of the motion.

- A. 6km
- B. 12km
- C. 18km
- D. 24km.

8. A rocket is fired from the earth's surface to a distant planet. By Newton's law of universal gravitation, the force  $F$  will \_\_\_\_\_

- A. increase as  $a$  reduces
- B. increase as  $G$  varies
- C. remains constant
- D. increases as  $r$  increases

9. If a freely suspended object is pulled to one side and released, it oscillates about the point of suspension because the \_\_\_\_\_

- A. acceleration is directly proportional to the displacement

B. motion is directed away from the equilibrium point

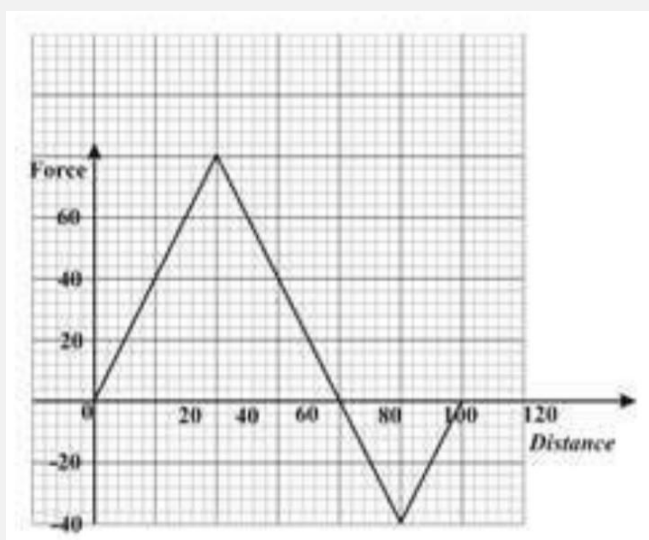
C. acceleration is directly proportional to the square of the displacement

D. velocity is minimum at the equilibrium point.

10. An object moves in a circular path of radius 0.5m with a speed of  $1\text{ms}^{-1}$ . What is its angular velocity?

- A.  $8\text{ rads}^{-1}$
- B.  $4\text{ rads}^{-1}$
- C.  $2\text{ rads}^{-1}$
- D.  $1\text{ rads}^{-1}$

11.

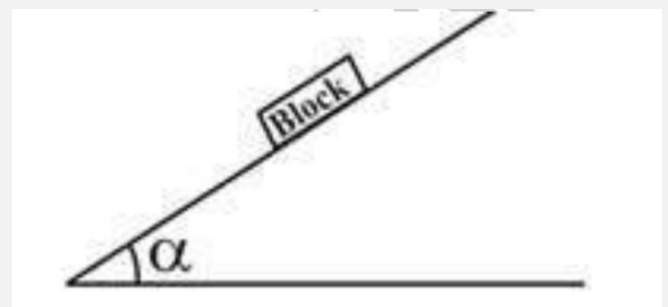


From the diagram above, calculate the work done when the

particle moves from  $x = 0\text{m}$  to  $x = 80\text{m}$ .

- A. 1200J
- B. 2400J
- C. 6000J
- D. 7000J

12.



The diagram above shows a wooden block just about to slide down an inclined plane whose inclination to the horizontal is  $\alpha$ . The coefficient of frictional force between the block and the plane is \_\_\_\_\_

- A.  $\sin \alpha$
- B.  $\tan \alpha$
- C.  $\cot \alpha$
- D.  $\cos \alpha$

13. An object of mass 20kg slides down an inclined plane at an

angle of  $30^\circ$  to the horizontal.  
The coefficient of an active friction  
is \_\_\_\_\_

- A. 0.2
- B. 0.3
- C. 0.5
- D. 0.6

[ $g \approx 10\text{ms}^{-2}$ ]

14. A block and tackle is used to raise a load of 25N through a vertical distance of 30m. What is the efficiency of the system if the work done against friction is 1500J? [ $g \approx 10\text{ms}^{-2}$ ]

- A. 62.5%
- B. 73.3%
- C. 83.3%
- D. 94.3%

15. If a load of 1kg stretches a cord by 1.2cm, what is the force constant of the cord?

[ $g \approx 10\text{ms}^{-2}$ ]

- A.  $866\text{ Nm}^{-1}$
- B.  $833\text{ Nm}^{-1}$

C.  $769\text{ Nm}^{-1}$

D.  $667\text{ Nm}^{-1}$

16. An object of volume  $1\text{m}^3$  and mass 2kg is totally immersed in a liquid of density  $1\text{kgm}^{-3}$ . Calculate its apparent weight.

- A. 20 N
- B. 10 N
- C. 2 N
- D. 1 N

17. The pressure at any point in a liquid at rest depends only on the \_\_\_\_\_

- A. depth and the density
- B. mass and the volume
- C. quantity and the surface area
- D. surface area and the viscosity.

18. A balloon whose volume is  $300\text{m}^3$  is filled with hydrogen. If the density of air is  $1.3\text{kgm}^{-3}$ , find the up thrust on the balloon. [ $g \approx 10\text{ms}^{-2}$ ]

- A. 3000N

- B. 3800N
- C. 3900N
- D. 4200N

19. Clinical thermometers are examples of \_\_\_\_\_

- A. pressure gas thermometer
- B. resistance thermometer
- C. alcohol thermometer
- D. mercury-in-glass thermometer.

20. Two metals P and Q are heated through the same temperature difference. If the ratio of the linear expansivities of P to Q is 2:3 and the ratio of their lengths is 3:4 respectively, the ratio of the increase in lengths of P to Q is

- A. 1:2
- B. 2:1
- C. 8:9
- D. 9:8

21.  $2000\text{cm}^3$  of a gas is collected at  $27^\circ\text{C}$  and  $700\text{mmHg}$ . What is

the volume of the gas at standard temperature and pressure?

- A.  $1896.5\text{cm}^3$
- B.  $1767.3\text{cm}^3$
- C.  $1676.3\text{cm}^3$
- D.  $1456.5\text{cm}^3$

22. Calculate the temperature change when 500 J of heat is supplied to 100g of water.

- A.  $12.1^\circ\text{C}$
- B.  $2.1^\circ\text{C}$
- C.  $1.2^\circ\text{C}$
- D.  $0.1^\circ\text{C}$

(Specific heat capacity of water =  $4200\text{Jkg}^{-1}\text{K}^{-1}$ )

23. Which of the following is NOT a factor that can increase the rate of evaporation of water in a lake?

- A. Increase in the pressure of the atmosphere
- B. Rise in temperature
- C. Increase in the average speed of the molecules of water



D. Increase in the kinetic energy of the molecules of water.

24. The quantity of heat energy required to melt completely 1kg of ice at  $-30^{\circ}\text{C}$  is \_\_\_\_\_

A.  $4.13 \times 10^5\text{J}$

B.  $4.13 \times 10^5\text{J}$

C.  $3.56 \times 10^4\text{J}$

D.  $3.56 \times 10^2\text{J}$

(latent heat of fusion =  $3.5 \times 10^5\text{Jkg}^{-1}$ , specific heat capacity of ice =  $2.1 \times 10^3\text{Jkg}^{-1}\text{K}^{-1}$ )

25.

**I. It is a rapid, constant and irregular motion of tiny particles.**

**II. It gives evidence that tiny particles of matter called molecules exist.**

**III. It takes place only in gases.**

**IV. It gives evidence that molecules are in a constant state of random motion.**

Which of the combinations above is correct about Brownian motion?

A. **I, II and III**

B. **II, III and IV only**

C. **I, III and IV only**

D. **I, II and IV only**

26. The equation of a wave travelling in a horizontal direction is expressed as  $y=15 \sin \frac{2}{5} (60t-x)$  what is its wavelength?

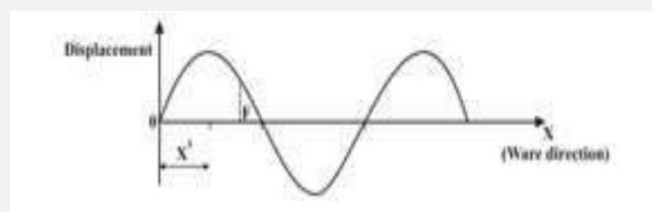
A. 60m

B. 15m

C. 5m

D. 2m

27.



From the diagram above, if the particles F is at a distance x from O to the right, the phase of the vibration will be different from that at O by \_\_\_\_\_

- A.  $\frac{2\pi x}{\lambda}$
- B.  $\frac{\pi x}{\lambda}$
- C.  $\frac{\lambda}{2\pi x}$
- D.  $\frac{\lambda}{\pi x}$

28. Which of the following factors will affect the velocity of sound?

- A. An increase in the pitch of the sound
- B. An increase in the loudness of the sound
- C. Wind travelling in the same direction of the sound
- D. A change in the atmospheric pressure at constant temperature.

29. The characteristics of a vibration that determines its intensity is the \_\_\_\_\_

- A. Frequency
- B. Overtone
- C. Wavelength
- D. Amplitude

30. Where a man can place his face to get an enlarged image

when using a concave mirror to shave.

- A. between the centre of curvature and the principle focus
- B. at principle focus
- C. between the principle focus and the pole
- D. At the centre of the curvature

31. A pinhole camera is placed 300m in front of a building so that the image is formed on a screen 5cm from the pinhole. If the image is 2.5cm high, the height of the building will be \_\_\_\_\_

- A. 25m
- B. 50m
- C. 100m
- D. 150m

32. The magnification of an object 2cm tall when placed 10cm in front of a plane mirror is \_\_\_\_\_

- A. 6.0
- B. 1.0
- C. 0.7

D. 0.6

33. After reflection from the concave mirror, rays of light from the sun converges \_\_\_\_\_

- A. At the radius of curvature
- B. At the focus
- C. Beyond the radius of curvature
- D. Between the focus and radius of curvature

34. A glass block of thickness 10cm is placed on an object. If an observer views the object vertically, the displacement of the object is \_\_\_\_\_

- A. 3.33cm
- B. 5.00cm
- C. 6.67cm
- D. 8.50cm

35.

**I. Rays of light travel from a less dense medium to a denser medium**

**II. The angle of incidence is greater than critical angle.**

**III. Rays of light travel from a denser medium to a less dense medium**

Which of the statements above are conditions for total internal reflection to occur?

- A. **I & II only**
- B. **I & III only**
- C. **II & III only**
- D. **II only**

36. The use of lenses is NOT applicable in the \_\_\_\_\_

- A. projector
- B. human eye
- C. periscope
- D. telescope

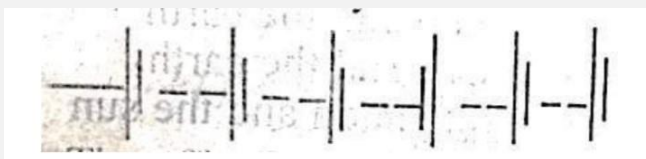
37. Dispersion of white light is the ability of white light to \_\_\_\_\_

- A. Penetrate air, water and glass
- B. Move in a straight line
- C. Move around corners
- D. Separate to its component colours

38. A newly charged 12V accumulator can easily start a car whereas eight new dry cells in series with an effective e.m.f. of 12V cannot start the same car because \_\_\_\_\_

- A. The current capacity is high
- B. The current capacity is low
- C. It cannot be re-charged
- D. It cannot easily be connected to a car

39.



Six identical cells, each of e.m.f. 2V are connected as shown above. The effective e.m.f. of the cell is \_\_\_\_\_

- A. 0V
- B. 4V
- C. 6V
- D. 12V

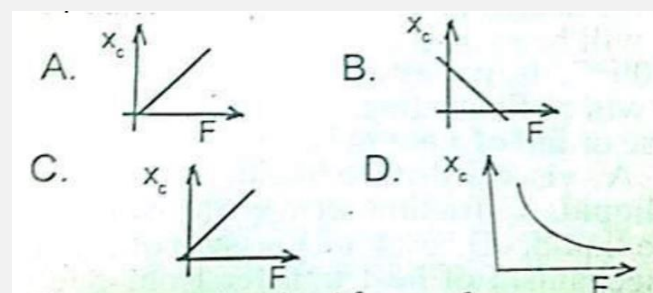
40. The fuse in an electric device is always connected to the \_\_\_\_\_

- A. Neutral side of an electric supply
- B. Earth side of an electric supply
- C. Live side of an electric supply
- D. Terminal side of an electric supply

41. A particle carrying a charge of  $1.0 \times 10^{-8}\text{C}$  enters a magnetic field at  $3.0 \times 10^2\text{ms}^{-1}$  at right angles to the field. If the force on this particle is  $1.8 \times 10^{-8}\text{N}$ , what is the magnitude of the field?

- A.  $6.0 \times 10^{-1}\text{T}$
- B.  $6.0 \times 10^{-2}\text{T}$
- C.  $6.0 \times 10^{-3}\text{T}$
- D.  $6.0 \times 10^{-4}\text{T}$

42. Which of the following is the correct shape of the graph of capacity reactance  $X_c$  versus frequency  $F$  for a pure capacitor in an a.c. circuit?



43. The current output form of an a.c. source is given as  $I = 10 \sin \omega t$ . The d.c. equivalent of the current is

- A. 5.0A
- B. 7.1A
- C. 10.0A
- D. 14.1A

44. A conductor of length 1m moves with a velocity of  $50\text{ms}^{-1}$  at an angle of  $30^\circ$  to the direction of a uniform magnetic field of flux density  $1.5 \text{ Wbm}^{-2}$ . What is the e.m.f. induced in the conductor?

- A. 37.5V
- B. 50.5V
- C. 75.0V
- D. 80.5V

45. The process of detecting a pin mistakenly swallowed by a child x-ray.

- A. Diagnosis
- B. Therapy
- C. Crystallography

D. mammography

46. Which of the following particles CANNOT be deflected by both electric and magnetic fields?

- A. Gamma rays
- B. Alpha particles
- C. Wave particles
- D. Beta particles

47. A piece of radioactive material contains 1000 atoms. If its half-life is 20 seconds, the time taken for 125 atoms to remain is \_\_\_\_\_

- A. 20 seconds
- B. 40 seconds
- C. 60 seconds
- D. 80 seconds

48. The p-n junction diodes can act as rectifiers because they \_\_\_\_\_

- A. Conduct current when forward biased
- B. Conduct current when reverse-biased

C. Block current when forward biased

D. Conduct current in both directions

49. If a reverse-biased voltage is applied across a p-n junction, the depletion layer width is \_\_\_\_\_

A. Increased

B. Decreased

C. Constant

D. halved

50.

**I. Small size**

**II. Low power requirement**

**III. Not easily damaged by high Temperature**

**IV. Highly durable**

Which of the above are the advantages of semiconductors?

A. **I, II and III only**

B. **II, III and IV only**

C. **I, II and IV only**

D. **I, II III and IV**

## **CHECK YOUR ANSWERS**

*Would you like to get or confirm the **correct answer(s) with explanations** to any or all of these questions?*

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## JAMB PHYSICS PAST QUESTIONS (PT.3)

### PAPER TYPE: D

1. Which Question Paper Type of Physics is given to you?

- A. Type D.
- B. Type I.
- C. Type B.
- D. Type U.

2. When a brick is taken from the earth's surface to the moon, its mass \_\_\_\_\_

- A. remains constant
- B. reduces.
- C. increases.
- D. becomes zero.

3. The resultant of two forces is 50N. If the forces are perpendicular to each other and one of them makes an angle of  $30^\circ$  with the resultant, find its magnitude.

- A. 100.0N
- B. 57.7N

C. 43.3 N

D. 25.0N

4. The pair of physical quantities that are scalar only are \_\_\_\_\_

- A. volume and area
- B. moment and momentum
- C. length and displacement.
- D. impulse and time.

5. A simple pendulum of length 0.4m has a period of 2s. What is the period a similar pendulum of length 0.8m at the same place?

- A. 8s
- B. 4s
- C.  $2\sqrt{2}s$
- D.  $\sqrt{2}s$

6. A train with an initial velocity of  $20\text{ms}^{-1}$  is subjected to a uniform deceleration of  $2\text{m}^{-2}$ . The time required to bring the train to a complete halt is \_\_\_\_\_

- A. 5s.

- B. 10s.
- C. 20s.
- D. 40s.

7. Calculate the apparent weight loss of a man weighing 70kg in an elevator moving downwards with an acceleration of  $1.5\text{ms}^{-2}$ .

- A. 686N.
- B. 595N.
- C. 581N.
- D. 1105N

$$[g \approx 10\text{ms}^{-2}]$$

8. A piece of cork floats in a liquid. What fraction of its volume will be immersed in the liquid?

- A. 0.8.
- B. 0.5.
- C. 0.2.
- D. 0.1.

$$[\text{Density of the cork} = 0.25 \times 10^3\text{kg}^{-3}, \text{ density of the liquid} = 1.25 \times 10^3\text{kgm}^{-3}]$$

9. An object is moving with a velocity of  $5\text{ms}^{-1}$ . At what height must a similar body be situated to have a potential energy equal in value with kinetic energy of the moving body?

- A. 25.0m
- B. 20.0m.
- C. 1.3m.
- D. 1.0m.

10. If a pump is capable of lifting 5000kg of water through a vertical height of 60 m in 15 min, the power of the pump is \_\_\_\_\_

- A.  $2.5 \times 10^5\text{J}\text{s}^{-1}$
- B.  $2.5 \times 10^4\text{J}\text{s}^{-1}$
- C.  $3.3 \times 10^3\text{J}\text{s}^{-1}$
- D.  $3.3 \times 10^2\text{J}\text{s}^{-1}$

11. The coefficient of friction between two perfectly smooth surface is \_\_\_\_\_

- A. infinity.
- B. one
- C. half.



D. zero.

12. What effort will a machine of efficiency 90% apply to lift a load of 180N if its effort arm is twice as long as its load arm?

- A. 80N
- B. 90N.
- C. 100N.
- D. 120N.

13. Calculate the work done when a force of 20N stretches a spring by 50mm.

- A. 0.5J.
- B. 1.5J.
- C. 2.0J.
- D. 2.5J.

14. At what depth below the sea-level would one experience a change of pressure equal to one atmosphere?

- A. 0.1 m.
- B. 1.0m.
- C. 10.0m.

D. 100.0m

[Density of sea water =  $10^3 \text{kg}^{-3}$   
one atmosphere =  $0.01 \times 10^5$   
 $\text{Nm}^{-2}$   $g=10\text{ms}^{-2}$ ]

15. What volume of alcohol will have same mass as  $4.2\text{m}^{-3}$  of petrol?

- A.  $0.8\text{m}^3$ .
- B.  $1.4\text{m}^3$ .
- C.  $3.6\text{m}^3$ .
- D.  $4.9\text{m}^3$ .

16. Calculate the length which corresponds to a temperature of  $20^\circ\text{C}$  if the used steam points of an ungraduated thermometer are 400 mm apart.

- A. 20mm.
- B. 30mm.
- C. 60mm
- D. 80mm.

17. A wire of length 100.0m at  $30^\circ\text{C}$  has linear expansivity of  $2 \times 10^{-5}\text{K}^{-1}$ . Calculate the length of

the wire at a temperature of  $-10^{\circ}\text{C}$ .

- A. 100.08m.
- B. 100.04m.
- C. 99.96m
- D. 99.92m.

18. A gas at a pressure of  $10^5\text{Nm}^{-2}$  expands from  $0.6\text{m}^{-3}$  to  $1.2\text{m}^3$  at constant temperature, the work done is \_\_\_\_\_

- A.  $7.0 \times 10^6\text{J}$ .
- B.  $6.0 \times 10^6\text{J}$ .
- C.  $6.0 \times 10^5\text{J}$ .
- D.  $6.0 \times 10^4\text{J}$ .

19. Two liquids X and Y having the same mass are supplied with the same quantity of heat. If the temperature rise in X is twice that of Y, the ratio of specific heat capacity of X to that of Y is \_\_\_\_\_

- A. 2:1.
- B. 1:2.
- C. 4:1.
- D. 1:4.

20. Foods cook quicker in salt water than in pure water because of the effect of \_\_\_\_\_

- A. dissolved substances on the boiling point.
- B. atmospheric pressure on the boiling point.
- C. food nutrients on the thermal energy.
- D. salts on the thermal conductivity of water.

21. Steam from boiling water causes more damage on the skin than does boiling water because \_\_\_\_\_

- A. water has a high specific heat.
- B. steam has latent heat of fusion.
- C. the steam is at higher temperature than the water.
- D. steam brings heat more easily by convection.

22. What will happen to the boiling point of pure water when it

is heated in a place 30m below sea level?

- A. It will be more than 100°C.
- B. It will be less than 100°C.
- C. It will still be at 100°C.
- D. It will be fluctuating.

23. The rise or fall of liquid in a narrow tube is because of the \_\_\_\_\_

- A. viscosity of the liquid.
- B. surface tension of the liquid.
- C. friction between the walls of the tube and the liquid.
- D. osmotic pressure of the liquid.

24. The mechanism of heat transfer from one point to another through the vibration of the molecules of the medium is \_\_\_\_\_

- A. convection.
- B. conduction
- C. radiation
- D. diffusion

25. A wave travels through stretched strings is known as \_\_\_\_\_

- A. electromagnetic wave.
- B. micro wave.
- C. mechanical wave.
- D. seismic wave.

26. A transverse wave and a longitudinal wave travelling in the same direction in a medium differ essentially in their \_\_\_\_\_

- A. frequency.
- B. amplitude.
- C. direction of vibration of the particles of the medium
- D. period of vibration of the particles of the medium.

27. What is the velocity of sound at 100°C, if the velocity of sound at 0°C is  $340\text{ms}^{-1}$ ?

- A.  $497\text{ms}^{-1}$
- B.  $440\text{ms}^{-1}$
- C.  $397\text{ms}^{-1}$
- D.  $240\text{ms}^{-1}$

28. If a sonometer has a fundamental frequency of 450Hz, what is the frequency of the fifth overtone?

- A. 2700Hz
- B. 456Hz
- C. 44Hz
- D. 75Hz

29. A man 1.5m tall is standing 3m in front of a pinhole camera whose distance between the hole and the screen is 0.1m. What is the height of the image of the man on the screen?

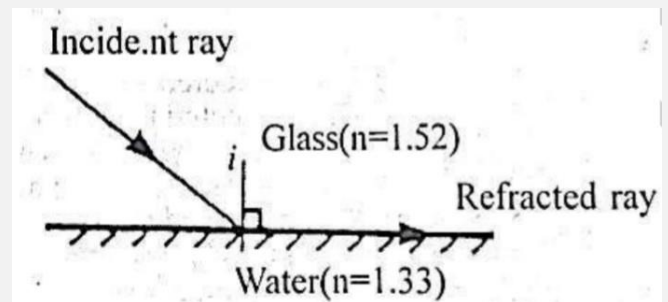
- A. 0.05m
- B. 0.15m.
- C. 0.30m.
- D. 1.00m.

30. A ray of light passing through the centre of curvature of a concave mirror is reflected by the mirror at \_\_\_\_\_

- A.  $0^\circ$ .
- B.  $45^\circ$ .

- C.  $90^\circ$ .
- D.  $180^\circ$

31. From the diagram below, calculate the incident angle  $i$ .

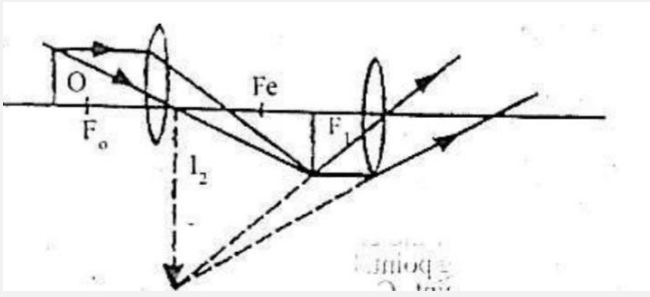


- A.  $41^\circ$ .
- B.  $49^\circ$ .
- C.  $55^\circ$ .
- D.  $61^\circ$ .

32. Total internal reflection will not occur when light travels from \_\_\_\_\_

- A. water to air.
- B. water into glass.
- C. glass to air.
- D. glass into water.

33.



What does the diagram above represent?

- A. telescope in normal use.
- B. microscope in normal use.
- C. telescope in abnormal use.
- D. microscope in abnormal use.

34. If the linear magnification of the objective and eyepiece convex lenses of a compound microscope are 4 and 7 respectively, calculate the angular magnification of the microscope.

- A. 2.
- B. 3.
- C. 11.
- D. 28.

35. The angle of deviation of light of various colours passing through a triangular prism increases in the order \_\_\_\_\_

- A. red  $\rightarrow$  green  $\rightarrow$  blue.
- B. green  $\rightarrow$  violet  $\rightarrow$  blue.
- C. blue  $\rightarrow$  red  $\rightarrow$  green.
- D. blue  $\rightarrow$  green  $\rightarrow$  red.

36. Calculate the force acting on an electron of charge  $1.5 \times 10^{-19}\text{C}$  placed in an electric field of intensity  $10^5\text{Vm}^{-1}$ .

- A.  $1.5 \times 10^{-11}\text{N}$
- B.  $1.5 \times 10^{-12}\text{N}$
- C.  $1.5 \times 10^{-13}\text{N}$
- D.  $1.5 \times 10^{-14}\text{N}$

37. Capacitors are used in the induction coil to \_\_\_\_\_

- A. control circuits.
- B. dissipate energy.
- C. prevent electric sparks.
- D. prevent distortion of electric fields.

38. A cell of emf 1.5V is connected in series with a  $1\Omega$  resistor and a current of 0.3A flows through the resistor. Find the internal resistance of the cell.

- A.  $4\Omega$ .
- B.  $3.0\Omega$ .
- C.  $1.5\Omega$ .
- D.  $1.00\Omega$ .

39. Which of the following obeys ohms law?

- A. electrolytes.
- B. metals.
- C. diode.
- D. glass.

40. A house has ten 40W and five 100W bulbs. How much will it cost the owner of the house to keep them lit for 10 hours if the cost of a unit is ₦5?

- A. ₦90.
- B. ₦50.
- C. ₦45
- D. ₦40.

41. An electric device is rated 2000V, 250V. Calculate the maximum current it can take.

- A. 9A.

- B. 8A.
- C. 7A.
- D. 6A.

42. When a charge moves through an electric circuit in the direction of an electric force, it \_\_\_\_\_

- A. gains both potential and kinetic energy.
- B. gains potential energy and kinetic energy.
- C. loses potential energy and gains kinetic energy.
- D. loses both potential and kinetic energy.

43. To convert a galvanometer to voltmeter, a \_\_\_\_\_

- A. high resistance is connected to it in series.
- B. high resistance is connected to it in parallel.
- C. low resistance is connected to it in series.
- D. low resistance is connected to it in parallel.

44. Induced emfs are best explained using \_\_\_\_\_

- A. Ohm's law.
- B. Faraday's law.
- C. Coulomb's law.
- D. Lenz's law.

45. If a current of 2.5A flows through an electrolyte for 3 hours and 1.8g of a substance is deposited, what is the mass of the substance that will be deposited if a current of 4A flows through it for 4.8 hours?

- A. 2.4g
- B. 3.2g
- C. 4.6g.
- D. 4.8g.

46. Calculate the energy of the third level of an atom if the ground state energy is -24eV

- A. -9.20eV.
- B. -8.20eV.
- C. -2.75eV.
- D. -1.75eV.

47. In photo-emission, the number of photoelectrons ejected per second depends on the \_\_\_\_\_.

- A. frequency of the beam.
- B. work function of the metal.
- C. threshold frequency of the metal.
- D. intensity of the beam.

48. The particle nature of light is demonstrated by the \_\_\_\_\_

- A. photoelectric effect.
- B. speed of light.
- C. colours of light.
- D. diffraction of light.

49. The energy of a photon having a wavelength of  $10^{-10}\text{m}$  is \_\_\_\_\_

- A.  $2.0 \times 10^{-15}\text{J}$
- B.  $1.7 \times 10^{-13}\text{J}$
- C.  $2.0 \times 10^{-12}\text{J}$
- D.  $1.7 \times 10^{-12}\text{J}$

$$(h = 6.63 \times 10^{-34}\text{Js} \quad c = 3.0 \times 10^8\text{ms}^{-1})$$

50. The bond between silicon and germanium is \_\_\_\_\_

- A. dative.
- B. covalent.
- C. trivalent.
- D. ionic.

## **CHECK YOUR ANSWERS**

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## PAPER TYPE: F

1. Which question paper type of physics is given to you?

- A. Type F
- B. Type E
- C. Type L
- D. Type S

2. What is the least possible error encountered when taking measurement with a meter rule?

- A. 0.1mm
- B. 1.0mm
- C. 0.5mm
- D. 0.2mm

3. A quantity which requires magnitude and direction to be specified is \_\_\_\_\_

- A. Temperature
- B. Distance
- C. Displacement
- D. Mass

4.

**I. Electrical potential**

**II. Torque**

**III. Kinetic Energy**

**IV. Momentum**

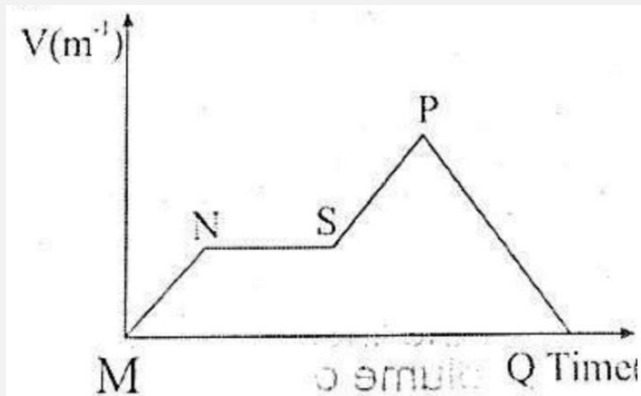
Which of the quantities listed are vectors?

- A. **II** and **IV**
- B. **I** and **II**
- C. **I** and **III**
- D. **II** and **III**

5. Which type of motion do the wheels of a moving car undergo?

- A. Vibratory and translational motion
- B. Random and translational motion
- C. Rotational and oscillatory motion
- D. Translational and rotational motion

6. From the diagram below, the region of zero acceleration is \_\_\_\_\_



- A. MN
- B. NS
- C. SP
- D. PQ

7. A car accelerates uniformly from rest at  $3\text{ms}^{-2}$ . Its velocity after traveling a distance of 24m is \_\_\_\_\_

- A.  $12\text{ms}^{-1}$
- B.  $144\text{ms}^{-1}$
- C.  $72\text{ms}^{-1}$
- D.  $36\text{ms}^{-1}$

8. Calculate the escape velocity of a satellite launched from the earth's surface if the radius of the earth is  $6.4 \times 10^6\text{m}$

- A.  $25.3\text{kms}^{-1}$
- B.  $4.2\text{kms}^{-1}$
- C.  $4.0\text{kms}^{-1}$
- D.  $11.3\text{kms}^{-1}$

9. An object of weight 80kg on earth is taken to a planet where acceleration due to gravity is one-third of its value on earth. The weight of the object on the planet is \_\_\_\_\_

- A. 48N
- B. 12N
- C. 27N
- D. 36N

10. One of the conditions necessary for an object to be in equilibrium when acted upon by a number of parallel forces is that the vector sum of the forces is \_\_\_\_\_

- A. Average
- B. Zero
- C. Negative
- D. Positive

11. What happens when three coplanar non-parallel forces are in equilibrium?

- A. Their lines of action are parallel.
- B. They are represented in magnitude only
- C. They are represented in direction only
- D. Their lines of action meet at a point

12. An object of mass 20kg is released from a height of 10m above the ground level. The kinetic energy of the object just before it hits the ground is \_\_\_\_\_

- A. 200J
- B. 4000J
- C. 2000J
- D. 500J

13. The energy in the nucleus of atoms produce heat which can be used to generate

- A. Kinetic energy

- B. Mechanical energy
- C. Electrical energy
- D. Potential energy

14. A machine whose efficiency is 75% is used to lift a load of 1000N. Calculate the effort put in to the machine if it has a Velocity ratio of 4.

- A. 343.32N
- B. 233.33N
- C. 333.33N
- D. 334.33N

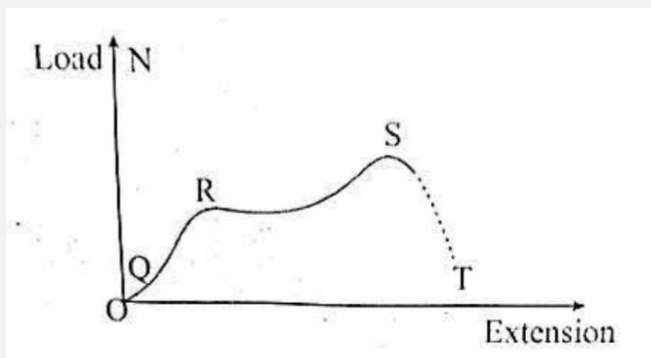
15. A wheel and an axle is used to raise a load whose weight is 800N when an effort of 250N is applied. If the radii of the wheel and axle are 800mm and 200mm respectively, the efficiency of the machine is \_\_\_\_\_

- A. 90%
- B. 80%
- C. 85%
- D. 87%

16. A force of 500N is applied to a steel wire of cross-sectional area  $0.2\text{m}^2$ , the tensile stress is \_\_\_\_\_

- A.  $2.5 \times 10^4 \text{Nm}^{-2}$
- B.  $1.0 \times 10^2 \text{Nm}^{-2}$
- C.  $1.0 \times 10^3 \text{Nm}^{-2}$
- D.  $2.5 \times 10^3 \text{Nm}^{-2}$

17.



From the diagram above, the point that represent the elastic limit is \_\_\_\_\_

- A. Q
- B. R
- C. S
- D. T

18. The small droplet of water that forms on the grass in early hours of the morning is \_\_\_\_\_

- A. haul
- B. mist
- C. dew
- D. fog

19. What is the equivalent of 20K in Celsius scale?

- A.  $293\text{ }^\circ\text{C}$
- B.  $68\text{ }^\circ\text{C}$
- C.  $36\text{ }^\circ\text{C}$
- D.  $20\text{ }^\circ\text{C}$

20. A glass bottle of initial volume  $2 \times 10^4 \text{cm}^3$  is heated from  $20\text{ }^\circ\text{C}$  to  $50\text{ }^\circ\text{C}$ . If the linear expansivity of glass is  $9 \times 10^{-6} \text{K}^{-1}$ , the volume of the bottle at  $50\text{ }^\circ\text{C}$  is \_\_\_\_\_

- A.  $20\ 016.2 \text{cm}^3$
- B.  $20\ 005.4 \text{cm}^3$
- C.  $20\ 008.1 \text{cm}^3$
- D.  $20\ 013.5 \text{cm}^3$

21. The equation  $P_a V_b T_c = \text{constant}$  reduces to Charles Law if \_\_\_\_\_

- A.  $a=1, b=1$  and  $c=0$
- B.  $a=1, b=0$  and  $c=-1$

C.  $a=0$ ,  $b=1$  and  $c=1$

D.  $a=0$ ,  $b=1$  and  $c=-1$

22. The quantity of heat needed to raise the temperature of a body by 1K is the body's.

A. Heat capacity

B. Internal energy

C. Specific heat capacity

D. Latent heat of fusion

23. The melting point of a substance is equivalent to its

\_\_\_\_\_

A. Vapor Pressure

B. solidification Temperature

C. Liquidification Temperature

D. Solidification Pressures

24. The temperature at which the water vapour present in the air is just sufficient to saturate air is

\_\_\_\_\_

A. Boiling point

B. Ice point

C. Saturation point

D. Dew point

25. Heat transfer by convection in a liquid is due to the \_\_\_\_\_

A. Latent heat of vaporization of the liquid

B. Increased vibration of the molecules of the liquid about their mean position

C. Variation of density of the liquid

D. Expansion of the liquid as it is heated

26. The distance between two successive crests of a wave is 15cm and the velocity  $300\text{ms}^{-1}$ . Calculate the frequency.

A.  $2.0 \times 10^2 \text{Hz}$

B.  $4.5 \times 10^3 \text{Hz}$

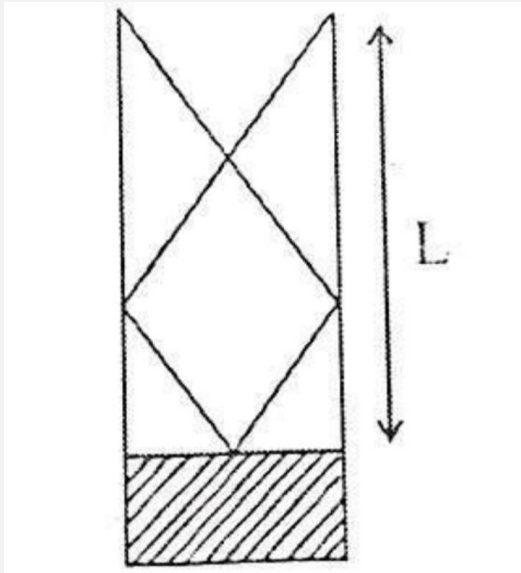
C.  $2.0 \times 10^3 \text{Hz}$

D.  $4.5 \times 10^2 \text{Hz}$

27. A boy receives the echo of his clap reflected by a nearby hill 0.8s later. How far is he from the hill?

- A. 528m
- B. 66m
- C. 136m
- D. 264m

28.



The diagram above show a stationary wave of wavelength 40 cm in a closed tube. The length  $l$  is the resonating air column is \_\_\_\_\_

- A. 10cm
- B. 20cm
- C. 30cm
- D. 40cm

29. An object is placed 10m from a pinhole camera of length 25cm. Calculate the linear magnification.

- A.  $2.5 \times 10^{-2}$
- B.  $2.5 \times 10^{-1}$
- C.  $2.5 \times 10^1$
- D.  $2.5 \times 10^2$

30. The focal length of a concave mirror is 2.0cm. If an object is placed 8.0cm from it, the image is at \_\_\_\_\_

- A. 2.7m
- B. 2.0m
- C. 2.3m
- D. 2.5m

31. In a compound microscope, the objective and the eye piece focal lengths are \_\_\_\_\_

- A. Long
- B. Short
- C. The same
- D. At infinity

32. When a telescope is in normal use, the final image is at \_\_\_\_\_

- A. The focus
- B. The radius of curvature
- C. The near point
- D. Infinity

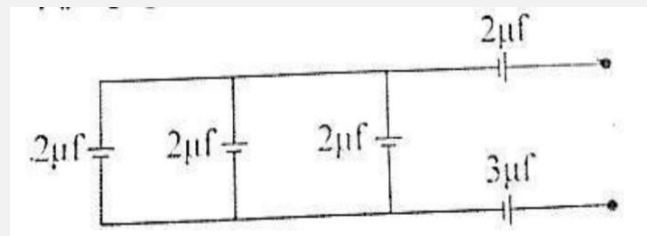
33. When a negatively charged rod is brought near the cap of a charged gold leaf electroscope which has positive charges, the leaf \_\_\_\_\_

- A. Collapses
- B. Collapses and diverges again
- C. Diverges
- D. Remains the same

34. What charge is stored in a 0.1F capacitor when a 10V supply is connected across it?

- A. 1C
- B. 5C
- C. 4C
- D. 2C

35.



Calculate the effective capacitance of the circuit above

- A. 1uf
- B. 2uf
- C. 3uf
- D. 4uf

36. The maximum power transfer occurs in a cell when the external resistance is \_\_\_\_\_

- A. Twice the internal resistance of the cell
- B. The same as the internal resistance of the cell
- C. Greater than the internal resistance of the cell
- D. Less than the internal resistance of the cell

37. If a metal wire 4m long and cross-sectional area 0.8 mm<sup>2</sup> has

a resistance of  $60\Omega$ , find the resistivity of the wire

- A.  $5.3 \times 10^{-7} \Omega\text{m}$
- B.  $3.0 \times 10^{-5} \Omega\text{m}$
- C.  $1.2 \times 10^{-6} \Omega\text{m}$
- D.  $3.2 \times 10^{-6} \Omega\text{m}$

38. A circuit has a resistance of  $200\Omega$ . The resistance of the circuit can be reduced to  $120\Omega$  when \_\_\_\_\_

- A. A  $300\Omega$  resistor is connected to it in parallel
- B. An  $80\Omega$  resistor is connected to it in series
- C. A  $150\Omega$  resistor is connected to it in parallel
- D. A  $240\Omega$  resistor is connected to it in series

39. PHCN measures its electrical energy in \_\_\_\_\_

- A. W
- B. KWh
- C. Wh
- D. J

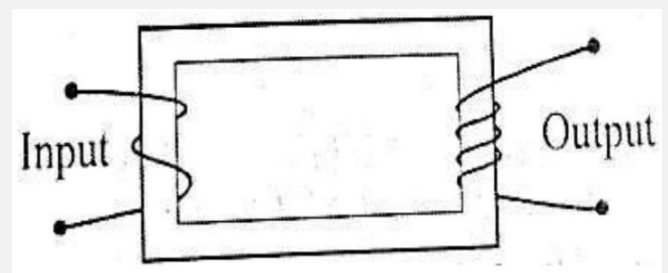
40. What is the best method of demagnetizing a steel bar magnet?

- A. Hammering
- B. Heating it
- C. Rough handling it
- D. Solenoid method

41. The magnitude of the angle of dip at the equator is \_\_\_\_\_

- A.  $360^\circ$
- B.  $0^\circ$
- C.  $90^\circ$
- D.  $180^\circ$

**Use the diagram below to answer question 42 and 43**



42. The diagram above is that of \_\_\_\_\_

- A. a step- up transformer
- B. a step - down transformer



C. an auto transformer

D. an oil transformer

43. The electromotive force in the secondary winding is \_\_\_\_\_

A. increasing

B. reducing

C. Stabilizing

D. Varying

44. What type of reaction is represented by the equation  ${}^2_1X + {}^2_1X \rightarrow {}^3_2Y + {}^1_0n + \text{energy}$ ?

A. Ionization

B. Fusion

C. Fission

D. Chain

45. When an atom undergoes a beta decay, the atomic number of the nucleus \_\_\_\_\_

A. Remains unchanged

B. Decreases by one

C. Increases by one

D. Becomes zero

46. Calculate the mass of the copper deposited during electrolysis when a current of 4A passes through a copper salt for 2 hours.

[ECE of Copper  $z = 3.3 \times 10^{-7} \text{kgC}^{-1}$ ]

A.  $2.9 \times 10^5 \text{kg}$

B.  $9.5 \times 10^{-7} \text{kg}$

C.  $9.5 \times 10^{-3} \text{kg}$

D.  $2.9 \times 10^{-4} \text{kg}$

47. Which gas produces a pink coloured light in a discharge tube?

A. Mercury

B. Argon

C. Air

D. Neon

48. When  ${}^{210}_{82}\text{Pb}$  decays to  ${}^{206}_{80}\text{Pb}$ , it emits \_\_\_\_\_

A. two alpha and two beta particles

B. an alpha particle

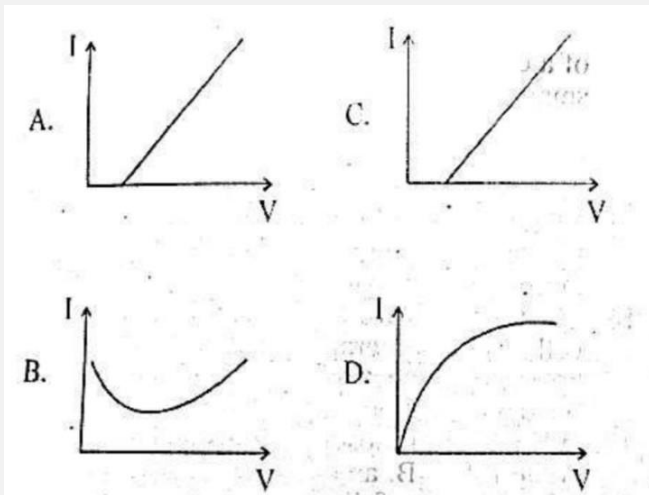
C. one beta particle

D. one alpha and one beta particle

49. In a common emitter configuration, the output voltage is through the \_\_\_\_\_

- A. Resistor
- B. Base
- C. Collector
- D. Emitter

50. Which of the graph below shows the characteristic of an i-v transistor?



## CHECK YOUR ANSWERS

Would you like to get or confirm the **correct answer(s) with explanations** to any or all of these questions?

**Download it NOW!**

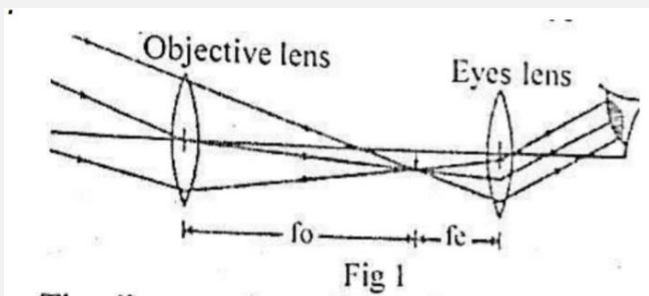
**CLICK HERE**

# JAMB PHYSICS PAST QUESTIONS (PT.5)

1. A piece of rubber 10cm long stretches 6mm when a load of 100N is hung from it. What is the strain?

- A.  $6 \times 10^{-3}$
- B. 6
- C. 60
- D.  $6.0 \times 10^{-3}$

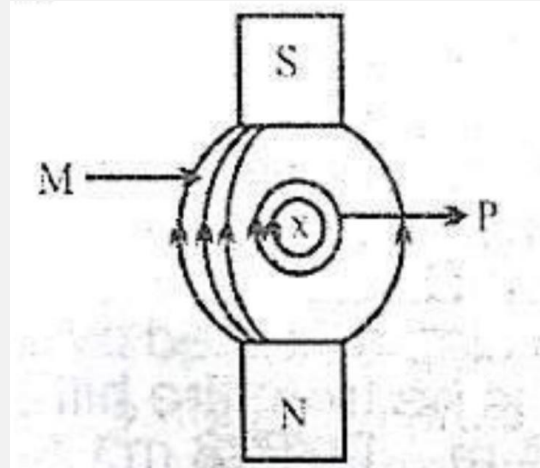
2.



The diagram above shows the lens arrangement in \_\_\_\_\_

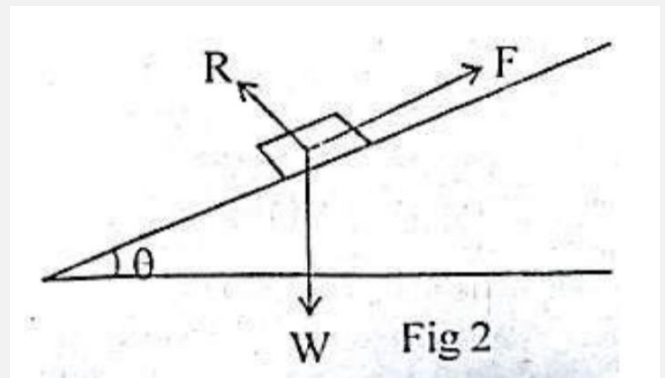
- A. compound microscope
- B. a binocular
- C. an astronomical
- D. a periscope

3. What is the total resistance in the below diagram?



- A. 5 ohms
- B. 25 ohms
- C. 15 ohms
- D. 35 ohms

4.



A body of mass 6kg rests on an inclined plane. The normal reaction  $R$  and the limiting frictional force is  $F$  as shown in the diagram (Fig. 2). If  $F$  is 30N and  $g=10\text{ms}^{-2}$ , then the angle of inclination  $\theta$  is \_\_\_\_\_

- A.  $15^\circ$
- B.  $60^\circ$
- C.  $45^\circ$
- D.  $30^\circ$

5. The speed of light in air is  $3.0 \times 10^8 \text{ms}^{-1}$ . Its speed in glass having a refractive index of 1.65 is \_\_\_\_\_

- A.  $1.82 \times 10^8 \text{ms}^{-1}$
- B.  $3.00 \times 10^8 \text{ms}^{-1}$
- C.  $4.95 \times 10^8 \text{ms}^{-1}$
- D.  $1.65 \times 10^8 \text{ms}^{-1}$

6. Longitudinal waves do not exhibit \_\_\_\_\_

- A. refraction
- B. polarization
- C. diffraction
- D. reflection

7. A device that converts sound energy into electrical energy is \_\_\_\_\_

- A. the horn of a motor car
- B. the telephone earpiece
- C. a loudspeaker

D. a microphone.

8. A good calorimeter should be of \_\_\_\_\_

- A. low specific heat capacity and low heat conductivity
- B. high specific heat capacity and low heat conductivity
- C. high specific heat capacity and low heat conductivity
- D. low specific heat capacity and high heat conductivity.

9. Which of the following is most strongly deflected by a magnetic field?

- A.  $\beta$ -particles
- B.  $\chi$ -particles
- C.  $\gamma$ -rays.
- D.  $\chi$ -rays

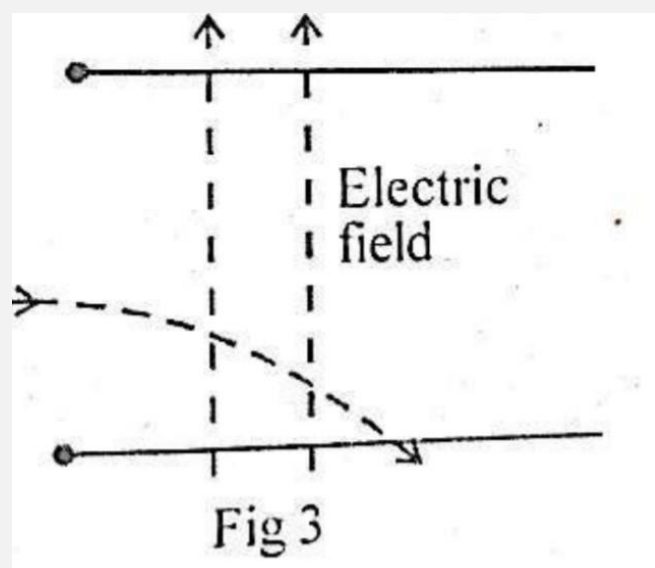
10. If a beaker is filled with water, it is observed that the surface of the water is not horizontal at the glass-water interface. This behaviour is due to \_\_\_\_\_

- A. friction
- B. surface tension
- C. viscosity
- D. evaporation

11. A dynamo primarily conducts \_\_\_\_\_

- A. potential energy into kinetic energy
- B. electrical energy into kinetic energy
- C. mechanical energy into electrical energy
- D. kinetic energy into potential energy

12.



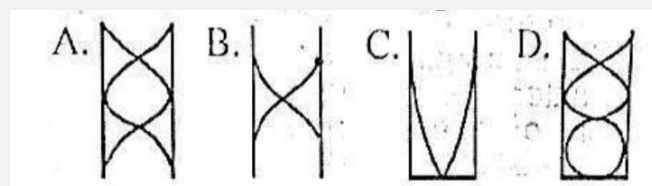
A particle is injected perpendicularly into an electric field. It travels along a curved

path as depicted in the figure 3.

The particle is \_\_\_\_\_

- A. gamma ray
- B. a proton
- C. a neutron
- D. an electron

13. In which of the following diagrams is the length of the length tube equal to one wavelength?



14. A calibrated potentiometer is used to measure the e.m.f. of a cell because the \_\_\_\_\_

- A. internal resistance of a cell is small compared with that of the potentiometer
- B. potentiometer takes no current from the cell
- C. potentiometer has a linear scale

D. resistance of the potentiometer is less than that of a voltmeter

15. Which of the following is a vector?

- A. Electric charge
- B. Electric potential difference
- C. Electric field
- D. Electrical capacitance.

16. The photocell works on the principle of the \_\_\_\_\_

- A. voltaic cell
- B. photographic plate
- C. emission of protons by incident electrons
- D. emission of electrons by incident radiation

17. When an atom loses or gains a charge, it becomes \_\_\_\_\_

- A. an ion
- B. an electron
- C. a neutron
- D. a proton

18. Which of the following characteristics of a wave is used in the measurement of the depth of the sea?

- A. Diffraction
- B. Reflection
- C. Refraction
- D. Interference

19. Which of the following are produced after a nuclear fusion process?

- I. One heavy nucleus
- II. Neutrons
- III. Protons
- IV. Energy

- A. **I** and **II**
- B. **II** and **III**
- C. **I** and **IV**
- D. **II** and **IV**.

20. Two similar kettles containing equal masses of boiling water are placed on a table. If the surface of one is highly polished and the surface of the other is covered

with soot, which of the following observations is correct?

- A. The two kettles will cool down at the same rate
- B. The polished kettle cools down more quickly by conduction
- C. The kettle covered with soot cools down more quickly because it is a good radiator of heat
- D. The kettle covered with soot cools down more quickly by the process of heat convection.

21. Total eclipse of the sun occurs when the \_\_\_\_\_

- A. moon is between the sun and the earth
- B. sun is between the moon and the earth
- C. the earth is between the moon and the sun
- D. ozone layer is threatened.

22. Which of the following pairs of colours gives the widest separation in the spectrum of white light?

- A. Green and Yellow
- B. Red and violet
- C. Red and indigo
- D. Yellow and violet.

23. Which of the following with respect to a body performing simple harmonic motion are in phase?

- A. Displacement and velocity of the body
- B. Displacement and force on the body
- C. Velocity and acceleration of the body
- D. Force acting on the body and the acceleration

24. A uniform metre rule weighing 0.5.V is to be pivoted on a knife-edge at the 30cm-mark. Where will a force of 2N be placed from the pivot to balance the metre rule?

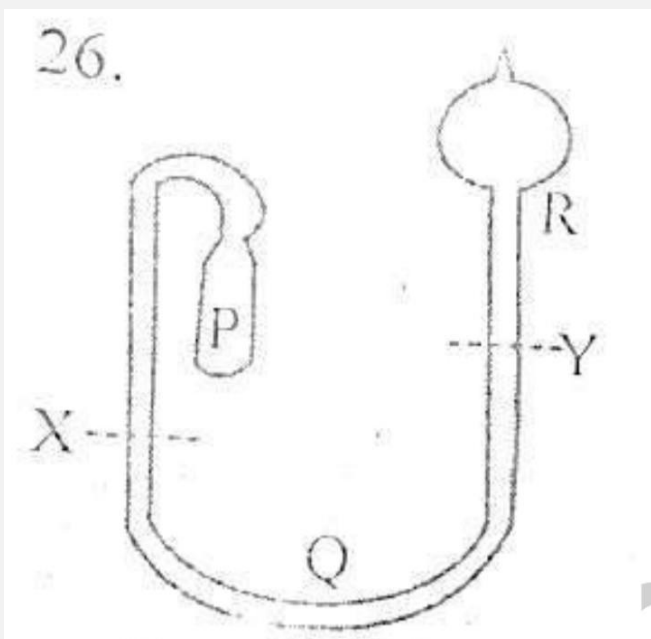
- A. 95cm
- B. 5cm
- C. 20cm

D. 25cm

25. A solid weighs 10.0N in air, 6.0N when fully immersed in water and 7.0N when fully immersed in a certain liquid X.

Calculate the relative density of the liquid.

- A. 3/4
- B. 4/3
- C. 5/3
- D. 7/10



The diagram above shows a maximum and minimum thermometer divided into three portions P, Q and r. which of the

following is true about the respective content of p, q and R?

- A. Air, alcohol and mercury
- B. alcohol, mercury and alcohol
- C. mercury, alcohol and mercury
- D. Air, mercury and alcohol

27. The process of energy production in the sun is \_\_\_\_\_

- A. nuclear fission
- B. nuclear fusion
- C. electron collision
- D. radioactivity decay

28. The particle is responsible for nuclear fusion in a nuclear reactor is \_\_\_\_\_

- A. electron
- B. Photon
- C. proton.
- D. Neutron

29. If the uncertainty in the measurement of the position of a particle is  $5 \times 10^{-10} \text{m}$ , the \_\_\_\_\_



uncertainty in the momentum of the particle is \_\_\_\_\_

- A.  $1.32 \times 10^{-24}$  Ns
- B.  $3.30 \times 10^{-44}$  Ns
- C.  $1.32 \times 10^{-44}$  Ns
- D.  $3.30 \times 10^{-24}$  Ns

[ $h=6.6 \times 10^{-34}$ ]

30. The change in volume when 450kg of ice is completely melted is \_\_\_\_\_

- A. 0.50m
- B.  $0.45\text{m}^3$
- C.  $4.50\text{m}^3$
- D.  $0.05\text{m}^3$

[density of ice =  $900\text{kgm}^{-3}$  Density of water =  $1000 \text{kgm}^{-3}$ ]

31. When impurities are added to semiconductor, its conductivity \_\_\_\_\_

- A. decreases
- B. increases then decreases
- C. decreases
- D. remains constant

32. The process through which free electrons leave the hot surface of hot metal is known as \_\_\_\_\_

- A. photo emission
- B. thermionic emission
- C. photon emission
- D. electron emission

33. The production of pure spectrum could easily be achieved using a \_\_\_\_\_

- A. Triangular prism only
- B. Triangular prism with two concave lens
- C. Glass prism with a pin
- D. Triangular prism with two convex lens.

34. A short chain is something attached to the back of a petrol tanker to \_\_\_\_\_

- A. Conduct excess charges to the earth
- B. Ensure the balancing of the tanker

C. Caution the driver when over speeding

D. Generate more friction

35. A perfect emitter or absorber of radiant energy is a \_\_\_\_\_

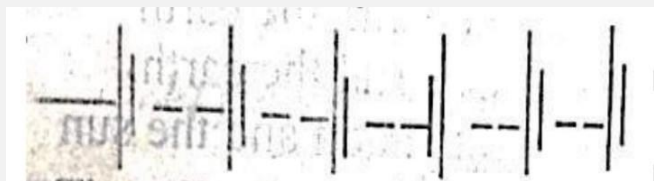
A. White body

B. Red body

C. Conductor

D. Black body

36.



Six identical cells, each of e.m.f 2V are connected as shown above. The effective e.m.f of the cell is \_\_\_\_\_

A. 4V

B. 0V

C. 6V

D. 12V

37. If a pump is capable of lifting 5000Kg of water through a vertical height of 60 m in 50

mins, the power of the pump is \_\_\_\_\_

A.  $2.5 \times 10^5 \text{Js}^{-1}$

B.  $3.3 \times 10^3 \text{Js}^{-1}$

C.  $2.5 \times 10^4 \text{Js}^{-1}$

D.  $3.3 \times 10^2 \text{Js}^{-1}$

38. The distance between two successive crest of a wave is 15 cm and the velocity is  $300 \text{ms}^{-1}$ . Calculate the frequency.

A.  $4.5 \times 10^5 \text{ Hz}$

A.  $4.5 \times 10^2 \text{ Hz}$

B.  $2.0 \times 10^3 \text{ Hz}$

C.  $2.0 \times 10^2 \text{ Hz}$

39. An electric lamp marked 240V, 60 Watts is left to operate for an hour. How much energy is generated by the filament?

A.  $3.86 \times 10^5 \text{ J}$

B.  $2.16 \times 10^5 \text{ J}$

C.  $1.80 \times 10^4 \text{ J}$

D.  $3.56 \times 10^5 \text{ J}$

40. In comparing the camera and human eye, the film of the camera functions as the \_\_\_\_\_

- A. Iris
- B. Pupil
- C. Retina
- D. Cornea

## ~~DISCLAIMER~~

These are **not** JAMB expo questions for this year, but past questions of previous years.

You are advised to study these past questions and know their **correct answers** as well as how the answer to each question was gotten to be well-prepared for your JAMB exam.

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