JAMB

Physics

Past questions

Paper Type: **Objective (PT. 6-10)**

~~NOT FOR SALE~~

JAMB PHYSICS PAST QUESTIONS (PT.6)

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

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

2.
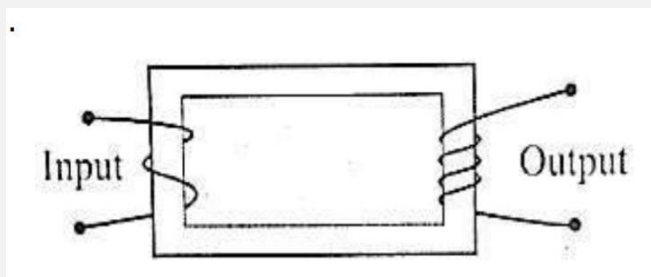
The electromotive force in the secondary winding is _____

A. stabilizing
B. reducings
C. increasing
D. varying

3. If a pump is capable of lifting 5000 kg of water through a vertical height of 60 in 15 mins, the power of the pump is _____

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

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

A. 12.1°C
B. 2.1°C
C. 1.2°C
D. 0.1°C

5. 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.

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

A. High pressure and low p.d

B. Low pressure and high p.d

C. Low pressure and low p.d

D. High pressure and high p.d

7. Dispersion occurs when white light passes through a glass prism because of the

A. defects in the glass.

B. high density of the glass.

C. different speeds of the colour in the glass.

D. different hidden colours in the glass.

8.
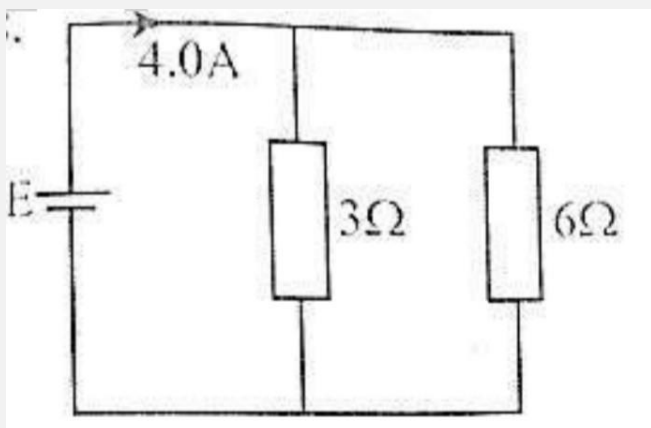
Calculate the e.m.f of the cell in the above circuit if its internal resistance is negligible.
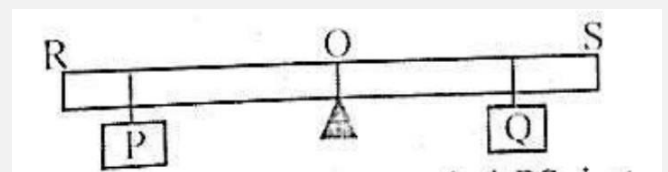
A. 12V

B. 36V

C. 2V

D. 8V

9. An object of mass 80kg is pulled on a horizontal rough ground by a force of 500N. Find the coefficient of static friction.

A. 0.6.

B. 0.4

C. 1.0

D. 0.8.

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

10.

The diagram above shows plank **RS** pivoted at its centre of gravity **O** and is in equilibrium with the weighs **P** and **Q**. If a weight 2P is added to **P**, the plank will be in equilibrium again by _____

A. moving **P** nearer to **O**.

B. moving **Q** nearer to **O**.

C. adding a weight **Q** to **Q**.

D. moving **P** further away from **O**.

11. A glass plate 0.9 cm thick has a refractive index of 1.50. How long does it take for a pulse of light to pass through the plate?

A. 3.0×10^{-10} s
B. 4.5×10^{-11} s
C. 3.0×10^{-11} s
D. 4.5×10^{-10} s
[c= $3.0 \times 10^{8} \text{m} s^{-1}$]

12. The main purpose of the transformer in an a.c radio set is to _____

A. increase power to the radio.
B. convert energy from a.c. to d.c
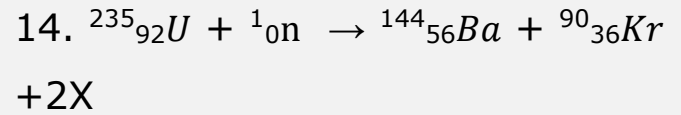C. step up the voltage.
D. step down the voltage.

13. The energy associated with the emitted photon when a mercury atom changes from one state to another is 3.3 eV. Calculate the frequency of the photon.

A. 3.2×10^{-53} Hz.
B. 3.1×10^{-53} Hz
C. 1.3×10^{-53} Hz
D. 8.0×10^{-53} Hz

14. $^{235}_{92}U + {}^{1}_{0}n \rightarrow {}^{144}_{56}Ba + {}^{90}_{36}Kr +2X$

In the reaction above, X is _____

A. electron.
B. neutron.
C. neutrino.
D. proton.

15. To protect a material from the influence of an external magnetic field, the material should be kept in a _____
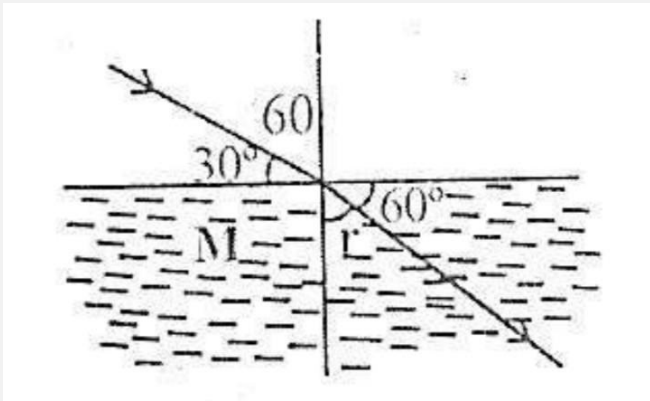
A. soft iron ring.
B. loop of copper wire.
C. triangular zinc ring.
D. square steel ring.

16.

The refractive index of the medium M in the diagram above is _____

A. $\frac{2}{\sqrt{3}}$

B. $\sqrt{3}$

C. $\frac{1}{\sqrt{3}}$

D. $\sqrt[2]{3}$

17. Thermal equilibrium between two objects exists when _____

A. the heat capacities of both objects are the same

B. the quantity of heat in both objects are the same.

C. the temperature of both objects are equal

D. one object loses heat continuously to the other.

18. Which of the following is a characteristic of stationary waves?

A. The antinode is a point of minimum displacement.

B. The distance between two successive nodes is one wavelength.

C. They can be transverse or longitudinal

D. They are formed by two identical waves travelling in opposite directions.

19. The height at which the atmosphere ceases to exist is about 80km. if the atmospheric pressure at a height of 20km above the ground level is _____

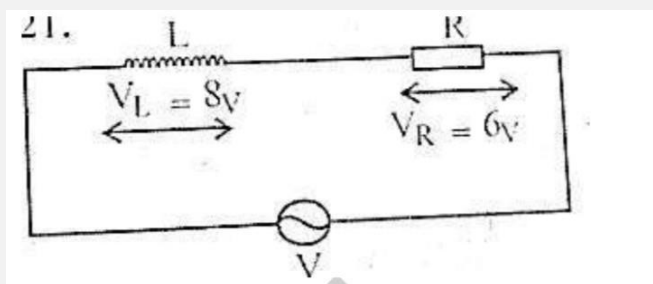A. 480mmhg

B. 570mmhg

C.190mmhg

D. 380mmhg

20. A metal of mass 0.5kg is heated to 100^0 and then transferred to a well–lagged

calorimeter of heat capacity 80jk^{-1} containing water of heat capacity of the metal

A. 92 j kg^{-1}

B. 286 j kg^{-1} k^{-1}

C. 133 j kg^{-1} k^{-1}

D. 887 j kg^{-1} k^{-1}

21. In the series a.c circuit shown below, the p.d across the inductor is 8 V.r.m.s. The effective voltage is _____

A. 10v

B. 2v

C. 14v

D. 48v

22. In a closed organ pipe producing a musical note, an antinode will always be produced at _____

A. the closed end

B. the middle

C. the open end

D. all the parts of the pipe.

23. What happens when a certain quantity of pure ice is completely changed to water at 0⁰C?

A. Latent heat is absorbed, the mass decreases and the volume increases.

B. latent heat is absorbed, the mass remains constant and the volume decreases.

C. latent heat is given out, the mass increases and the volume remains constant

D. latent heat is given out, the mass remains constant and the volume decreases.

24.
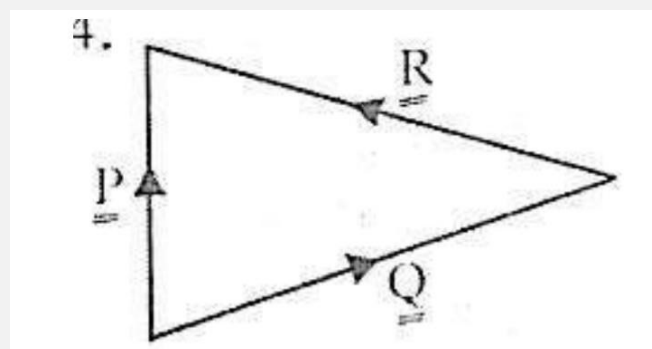
In the diagram above, PQ and R are vectors. Which of the following options gives the correct relationship between the vectors?

A. P =Q +R

B. P= Q − R

C. P= R − Q

D. P+ Q +R = O

25. If two parallel conductors carry currents flowing in the same direction, the conductors will _____

A. repel each other

B. attract each other

C. both move in the same direction.

D. have no effect on each other

26. Which of the following correctly explain(s) why a green leaf appears green in a bright daylight?

I. It absorbs only the green component of sunlight

II. It absorbs all colours in sunlight except green

III. It reflects only the green component of sunlight

A. **I** only

B. **II** and **III** only

C. **I** and **II** only

D. **II** only.

27. Which of the following factors has no effect on the e.m.f of a primary cell?

A. nature of plate

B. size of the cell

C. temperature

D. nature of the electrolyte.

28. When the bottom tip of a vibrating tuning fork is held in contact with a wooden box, a louder sound is heard. This phenomenon is known as _____

A. beats

B. echoing

C. reverberation

D. resonance

29. A particle of mass m which ia at rest splits up into two. If the mass and the velocity of one of the particles are m and v respectively, calculate the velocity of the second particle.

A. $\frac{MV}{M}$

B. $\frac{MV}{M-M}$

C. $\frac{MV}{M+M}$

D. $\frac{MV}{M-m}$

30. The electrochemical equivalent of silver is 0.0012g/C if 36.0g of silver is to be deposited by electrolysis on a surface by passing a steady current for 5.0 minutes, the current must be _____

A. 6000A

B. 100A

C. 100A

D. 1.0A

31. The principle of operation of an induction coil is based on _____

A. Ohm's

B. ampere's law

C. faraday's law

D. coulomb's law

32. A radioactive sample initially contains N atoms. After three half–lives the number of atoms that have disintegrated is _____

A. $\frac{7N}{8}$

B. $\frac{3n}{8}$

C. $\frac{5N}{8}$

D. $\frac{N}{8}$

33. Mercury is suitable as a barometric fluid because it _____

A. expands uniformly

B. is several times denser than water

C. is opaque

D. is a good conductor of heat

34. Which of the following features is **NOT** a characteristic of natural radioactivity?

A. radioactivity is a nuclear phenomenon

B. radioactivity is exhibited only by the element of mass number greater than 206

C. The radioactivity of an element is affected by electric and magnetic fields in the surroundings.

D Radioactive substances emit three types of radiations ∝-rays, β-rays and γ-rays.

35. Which of the following is a correct explanation of the **INERTIA** of a body?

A. Reluctance to start moving at rest and its reluctance to stop moving once it has begun move

B. Reluctance to stop moving

C. Readiness to start moving

D. Reluctance to start moving and its readiness to stop moving once it has begun to move

36. If the force on a charge of 0.2 coulomb in an electric field intensity of the field is _____

A. 0.8N/C

B. 20.0N/C

C. 0.8N/C

D. 4.2N/C

37. The point beyond which a stretched spring does not return to its original length is called the _____

A. breaking point

B. sprint constant

C. elastic limit

D. elasticity point

38. Which of the following statements is applicable to a real image formed by a concave mirror?

I. It can be observed on a screen
II. It is always inverted and in front of the mirror
III. It only seems to exist
IV. It is formed by the actual converging of rays of light.

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

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

C. **I** and **III** only

D. **I** and **II** only

39. Which of the following does not cause a reduction of the surface tension of water?

A. soap solution

B. detergent

C. alcohol

D. grease

40. In what range of temperature is the expansion of water anomalous?

A. +208⁰c to +212⁰c

B. -800⁰c to -76⁰c

C. 0⁰c to 4⁰c

D. -4⁰c to 0⁰

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

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

2. PHCN measures is electrical energy in _____

A. Wh.
B. Kwh
C. J
D. W.

3. The resultant of two forces is 50N. If the forces are perpendicular to each other and one of them makes an angle 30° with the resultant. Find its magnitude.

A. 100.0N
B. 57.7N
C. 25.0N

D. 43.3N

4. 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

5. The correct expression for the potential at a point, distance r from a charge q, in an electric field is _____

A. $\dfrac{q}{4\pi\epsilon\theta r}$

B. $\dfrac{q^2}{4\pi\epsilon\theta r^2}$

C. $\dfrac{q}{4\pi\epsilon\theta r^2}$

D. $\dfrac{q^2}{4\pi\epsilon\theta r}$

6. A typical transistor characteristic is represented as _____
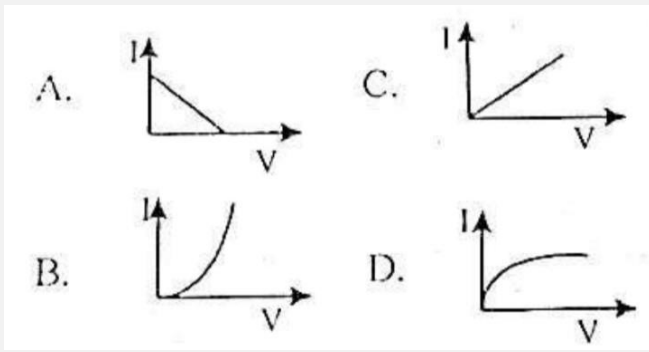
7. In a discharge tube, most of the gas is pumped out so that electricity is concluded at _____

A. steady voltage
B. high pressure
C. low pressure.
D. low voltage.

8.

    I. Moon

    II. Sun

    III. Street light

    IV. Stars

Which of the above is a natural source of light?

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

9. An object placed at the bottom of a well full of clear water appears closer to the surface due to _____

A. refraction.
B. reflection.
C. am inverter
D. a magnifier

10. A boy drags a bag of rice along a smooth horizontal flow with a force of 2N applied at an angle of 60° to the flow. The work done after a distance of 3m is _____

A. 6J.
B. 4 J
C. 5 J
D. 3 J

11. The spheres of masses 5.0kg and 10.0kg are 0.3m apart. Calculate the force of attraction between them.
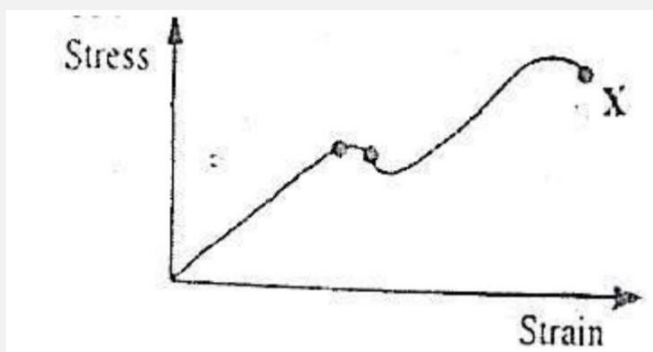
A. 3.57×10^{-2} N.
B. 3.71×10^{-2} N.

C. 4.00 X 10⁻² N.

D. 3.50 X 10⁻² N.

12. When very hot water is poured into two identical thin and thick glass tumblers in equal volumes, the thick one cracks because _____

A. of the even expansion of lass.

B. glass is a good conductor of heat.

C. glass is a crystal

D. of the uneven expansion of glass

13.

The diagram above represents the stress-strain for atypical metal rod. What does X represent?

A. Yield point

B. Breaking point

C. Elastic limit

D. proportional limit

14. Transverse waves can be distinguished from longitudinal waves using the characteristic of _____

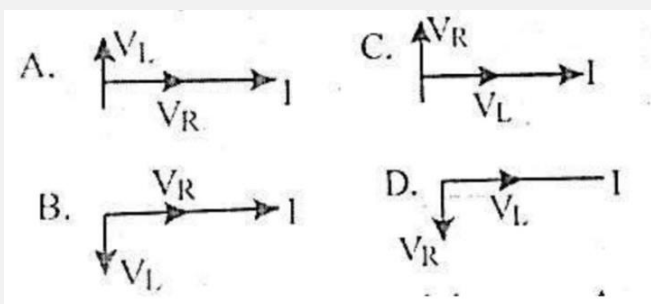A. diffraction

B. reflection.

C. polarization.

D. refraction.

15. Which of the following pairs of light rays shows the widest separation in the spectrum of white light?

A. Green and yellow.

B. Blue and red

C. Indigo and violet

D. Orange and red.

16.
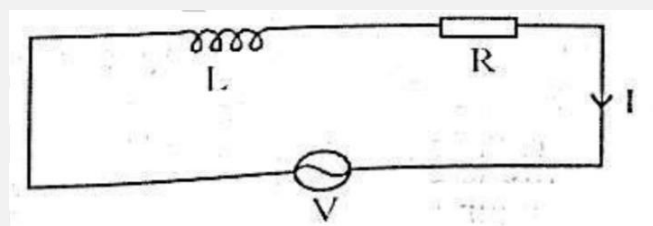
Which of the following graphs shows the correct vector diagram for the circuit above?

17. A transistor functions mainly as a _____

A. switch and an amplifier
B. rectifier and an amplifier
C. charge storer and a switch
D. charge storer and an amplifier

18. A thin wire with heavy weights attached to both ends is hung over a block of ice resting on two supports. If the wire cuts through the ice block while the lock remains solid behind the wire, the process is called _____

A. fusion
B. sublimation
C. regelation
D. condensation

19. The inner diameter of a small test tube can be measured accurately using a _____

A. micrometer screw gauge
B. pair of Vernier callipers
C. metre rule
D. pair of dividers

20. A platinum resistance thermometer records 3.0W at 0°C and 8/0w at 100°C. If it records 6.0W in a certain environment, the temperature of the medium is _____

A. 60°C
B. 80°C
C. 50°C
D. 30°C

21.
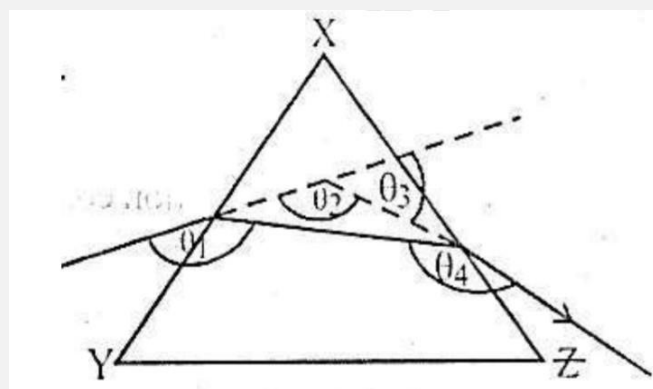
In the diagram above, which of the angles Ө1, Ө2, Ө3, and Ө4 is the angle of deviation of a ray of light passing through XYZ?

A. Ө2

B. Ө3

C. Ө1

D. Ө4

22. Which of the following is the dimension of pressure?

A. ML^2T^{-3}

B. MLT^{-2}

C. $ML2^{-1}T^{-2}$

D. ML^{-3}

23. A capacitor 8µF, is charged to a potential difference of 100V. The energy stored by the capacitor is _____

A. $1.0 \times 10^4 J$

B. $4.0 \times 10^{-2} J$

C. $1.25 \times 10\ J$

D. $8.0 \times 10\ J$

24. Which of the following statements correctly describe(s) cathode rays?

I. They consist of tiny particles carrying negative electric charges
II. They are deflected in a magnetic field but not in an electric filed.
III. They consist of fast-moving neutrons and deflected in an electric filed.

A. **I** only

B. **III** only

C. **I** and **II** only

D. **II** and **III** only

25. A concave mirror has a radius of curvature of 36cm. At what distance from the mirror should an object be placed to give a real image three times the size of the object?

A. 12cm

B. 24cm

C. 48cm

D. 108cm

26.
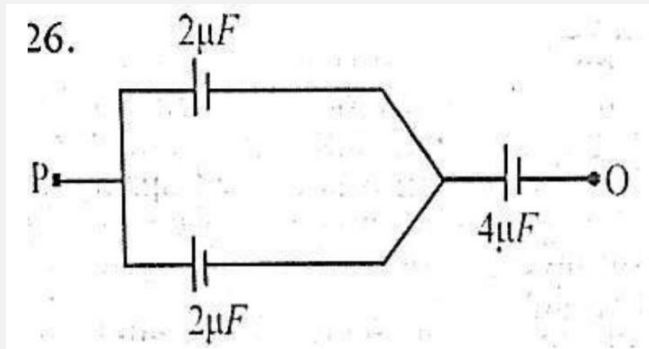
The net capacitance in the circuit shown above is _____

A. 8.0 µF

B. 6.0 µF

C. 2.0 µF

D. 4.0 µF

27. A sonometer wire of length 100cm under a tension of 10N, has a frequency of 250Hz. Keeping the length of the wire constant, the tension is adjusted to produce a new frequency of 350HZ. The new tension is _____

A. 5.1N

B. 19.6N

C. 14.0N

D. 7.1N

28. In a sound wave in air, the adjacent rarefactions and compressions are separated by a distance of 17cm. If the velocity of the sound wave is $340ms^{-1}$. Determine the frequency.

A. 10Hz

B. 20Hz

C. 5780Hz

D. 1000Hz

29. A note is called an octave of another note when _____

A. the notes have the same fundamental frequency

B. its frequency is half of the first note.

C. its frequency is twice that of the first note.

D. its periodic time is twice that of the first note

30. A metallic strip of iron and brass was heated. Which of the following diagrams accurately illustrated the shape of the strip after heating?

A. Brass / Iron
B. Brass / Iron
C. Brass / Iron
D. Brass / Iron
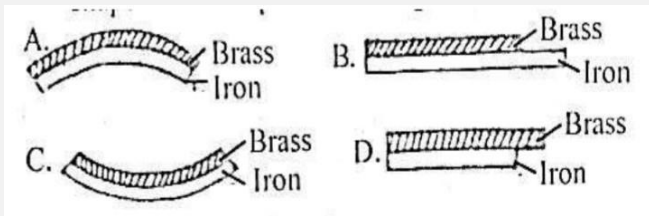
31. Which of the following is in a neutral equilibrium?

A. A heavy weight suspended on a string

B. The beam of a balance in use

C. A heavy-based table lamp

D. A cone resting on its slant edge

32. A convex mirror is used as a driving mirror because _____

    I. Its image is erect

    II. It has a large field of view

    III. It has a long focal length.

Identify the **CORRECT** statement(s).

A. **I** and **III** only

B. **I** and **II** only

C. **II** and **III** only

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

33. What is the cost of running five 50W lamps and four 100W lamps for 10 hours if electrical energy costs 2 kobo per kWh?

A. ₦ 0.13

B. ₦ 0.65

C. ₦ 3.90

D. ₦39.00

34. The specific latent heat of vaporization of a substance is always _____

A. less than its specific latent heat of fusion

B. equal to its specific latent heat of fusion

C. greater than its specific latent of fusion

D. all of the above depending on the nature of the substance.

35. A hydrometer is an instrument for measuring the _____

A. depth off water in a vessel

B. relative humidity of the air

C. relative density of a liquid by finding the apparent loss in weight

D. relative density of a liquid by the method of flotation

36. A transformer has 300 turns of wire in the primary coil and 30 turns in the secondary coil. If the input voltage is 100 volts, the output voltage is _____

A. 10 volts
B. 5 volts
C. 15 volts
D. 20 volts

37. The activity of a radioactive substance depends on _____

A. temperature and purity
B. purity and age
C. temperature and age
D. age, purity and temperature

38. The speed of light in air is 3 x $10^8 ms^{-1}$. If the refractive index of light from air-to-water is 4/3, then which of the following is the correct value of the speed of light in water?

A. 4 x $10^8 ms^{-1}$
B. 2.23 x $10^8 ms^{-1}$
C. 2.25 x $10^8 ms^{-2}$
D. 4/9 x $10^8 ms^{-1}$

39. A magnet is moved through a coil of wire. The e.m.f. produced in the wire depends on _____

A. the number of turns in the coil
B. the strength of magnet
C. the speed at which the magnet is moved
D. all of the above

40. A charge of one coulomb liberated 0.0033g of copper in an electrolytic process. How long will it take a current of 2A to liberate 1.98g of copper in such a process?

A. 30 minutes
B. 5 minutes
C. 50 minutes
D. 60 minutes

JAMB PHYSICS PAST QUESTIONS (PT.8)

1. A man walks 1 km due east and then 1km due north. His displacement is _____

A. $\sqrt{2}km$ N 45° E

B. 1km N 30°E

C. 1km N 15° E

D. D.√2 km N 60° E

2. The density of 400cm of palm oil was 0.9g before frying. If the density of the oil was 0.6 after frying, assuming no loss of oil to spilling, its new volume was _____

A. 360$cm3$

B. 600$cm3$

C. 240$cm3$

D. 800$cm3$

3. Which of the following is true of an electrical charge?

A. Positive charge means deficit electrons

B. Negative charge means excess of electrons

C. Electric current means movement of electrons

D. All of the above

4. Natural radioactivity consists of the emission of _____

A. ∝-particles and β-rays

B. ∝-particles and X-rays

C. ∝-particles, β-rays and g-rays

D. γ-rays and X-rays

5. Which of the following does NOT describe the image formed by a plane mirror?

A. Erect

B. Laterally inverted

C. Same distance from mirror as object

D. Magnified

6.

Fig. 4

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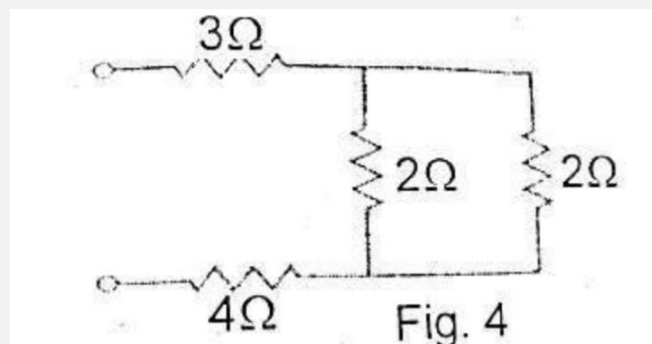
What is the resultant resistance of the circuit given above?

A. 8Ω

B. 11Ω

C. 4Ω

D. 3.6Ω

7. Which of the following best describes the energy changes which take place when a steam engine drives a generator which lights a lamp?

A. Heat → Light → Sound→ Kinetic

B. Heat→ Kinetic → Electricity→ Heat and Light

C. Kinetic→ Light → Heat →Electricity

D. Electricity →Kinetic→ Heat→ Light

8. Cathode rays are _____

A. High-energy electromagnetic waves

B. protons

C. neutrons

D. streams of electrons

9. A narrow beam of white light can be split into different colours by a glass prism. The correct explanation is that _____

A. white light is an electromagnetic wave

B. the prism has all the colours of the white light

C. different colours of white light travel with different speeds in glass

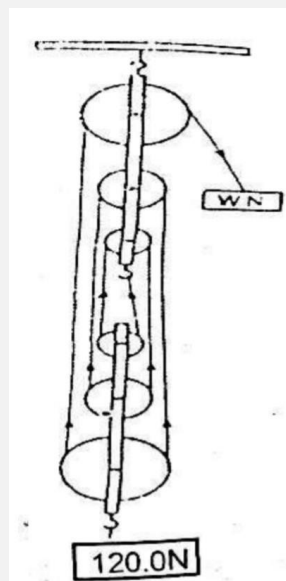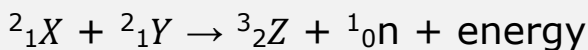D. white light has undergone total internal reflection in the prism.

10.

120.0N

Figure 2 represents a block- and-tackle pulley system on which an

effort of W Newton supports a load of 120.0N. If the efficiency of the machine is 40, then the value of W is _____

A. 28.0 N

B. 48.0 N

C. 288.0 N

D. 50.0 N

11. What type of reaction is represented by the following scheme?

$$^{2}_{1}X + {}^{2}_{1}Y \rightarrow {}^{3}_{2}Z + {}^{1}_{0}n + \text{energy}$$

A. Fusion reaction

B. Fission reaction

C. Chain reaction

D. Radioactive decay

12. The amount of heat needed to raise the temperature of 10kg of copper by 1K its _____

A. specific heat capacity

B. latent heat

C. heat capacity

D. internal energy

13. The electrochemical equivalent of silver 0.0012g/C/ of 36.0g of silver is to be deposited by electrolysis on a surface by passing a steady current for 5.0 minutes, the current must be _____

A. 6000A

B. 100A

C. 10A

D. 1A

14. Shadows and eclipses result from the _____

A. refraction of light

B. reflection of light

C. defraction of light

D. rectilinear propagation of light

15. Which of the following obeys Ohm's Law?

A. All metals

B. Diode only

C. All electrolytes

D. Glass

16. Which of the following statements are **TRUE** OF ISOTOPES?

I. *Isotopes of an element have the same chemical properties because they have the same number of electrons*

II. *Isotopes of elements are normally separated using physical properties*

III. *Isotopes of an element has the same number of protons in their nuclei.*

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

17.

In the diagram above, the hanging mass m is adjusted until m is on the verge of sliding. The coefficient of static friction between mass m and the table is _____

A. $\frac{m_1}{m_2}$

B. $\frac{m_1 g}{m_2}$

C. $\frac{m_2}{m_1}$

D. $\frac{m_2 g}{m_1}$

18. Which of the following may be used to explain a mirage?

I. *Layers of air near the road surface have varying refractive indices in hot weather*

II. *Road surfaces sometimes become good reflectors in hot weather.*

III. *Light from the sky can be reflected upwards after coming close to and the road surface.*

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

19. In the diagram below, if the atmosphere pressure is 760mm, the pressure in the chamber G is _____
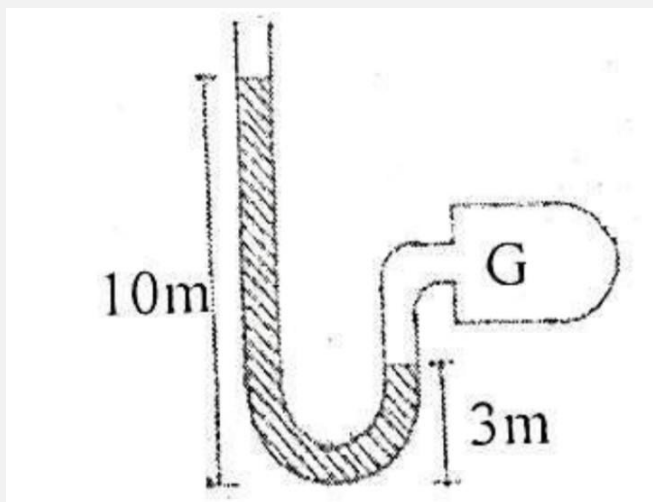
A. 660mm

B. 830mm

C. 690mm

D. 860mm

20. Which of the following has the lowest internal resistance when new?

A. Leclanche cell

B. Daniel cell

C. Torch battery

D. Accumulator

21. The pitch of an acoustic device can be increased by _____

A. decreasing the loudness

B. increasing the amplitude

C. increasing the frequency

D. decreasing the intensity.

22. One of the features of the fission process is that _____

A. it leads to chain reaction

B. its products are not radioactive

C. neutrons are not released.

D. the sum of the masses of the reactants equals the sum of the masses of the products

23. The linear expansivity of brass is $2 \times 10^{-5} C^{-1}$. If the volume of a piece of brass is $15.00 cm^3$ at 0°C, what is the volume at 100°C?

A. $16.03 cm^3$

B. $15.09 cm^3$

C. $16.00 cm^3$

D. $15.03 cm^3$

24. A lead bullet of mass 0.05kg is fired with a velocity of $200 ms^{-1}$ into a lead block of mass 0.95kg. Given that the lead block can

move freely, the final kinetic energy after impact is _____

A. 150 J

B. 100 J

C. 50 J

D. 200 J

25. In a series R-L-C circuit at resonance, the voltages across the resistor and the inductor are 20V and 40V respectively. What is the voltage across the capacitor?

A. 30 V

B. 70 V

C. 50 V

D. 40 V

26. If the fraction of the atoms of a radioactive material left after 120 years is 1/64, what is the half-life of the material?

A. 20 years

B. 10 years

C. 2 years

D. 24 years

27. In the diagram below, which of the simple pendula will resonate with **P** when set into oscillation?
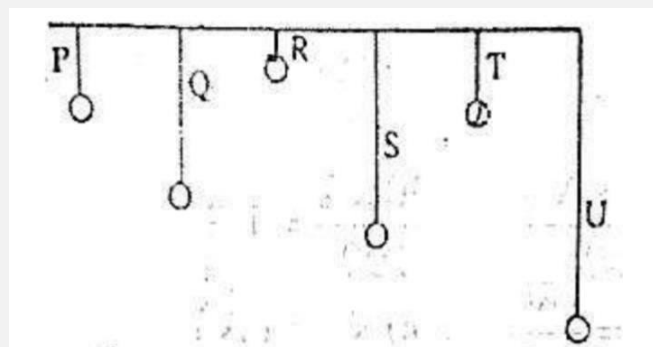
A. U

B. T

C. R and T

D. Q and R

28. The time rate of loss of heat by a body is proportional to the _____

A. temperature of its surroundings

B. temperature of the body

C. difference in temperature between the body and its surroundings

D. ration of the temperature of the boy to that of its surroundings

29. A positive charged rod X is brought near an uncharged metal sphere Y and is then touched by a finger with X still in place. When the finger is removed, the result is that Y has _____

A. no charge and a zero potential

B. a positive charge and a zero potential.

C. a negative charge and a positive potential.

D. a negative charge and a negative potential.

30. Electrical appliances in homes are normally earthed so that _____

A. a person touching the appliances is safe from electric shock.

B. both the a.c. and d.c. sources can be used.

C. the appliances are maintained at a higher p.d. than the earth.

D. the appliances are maintained at a lower p.d. than the earth.

31. The process whereby a liquid turns spontaneously into vapour is called _____

A. regelation

B. evaporation.

C. boiling.

D. sublimation.

32. Which of the following diagrams represents correctly an n-p-n transistor?
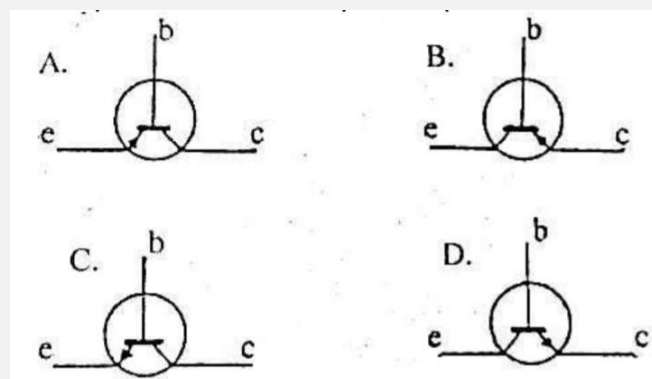
33. The differences observed in solids, liquids and gases may be accounted for by _____

A. their relative masses.

B. their melting points.

C. the spacing and forces acting between the molecules.

D. the different molecules in each of them.

34. Convex mirrors are used as driving mirrors because images formed are _____

A. erect, virtual and diminished
B. erect, real and diminished
C. erect, virtual and magnified
D. inverted, virtual and diminished.

35. Musical instruments playing the same note can be distinguished from one another owing to the differences in their _____

A. quality.
B. pitch.
C. intensity
D. loudness

36.
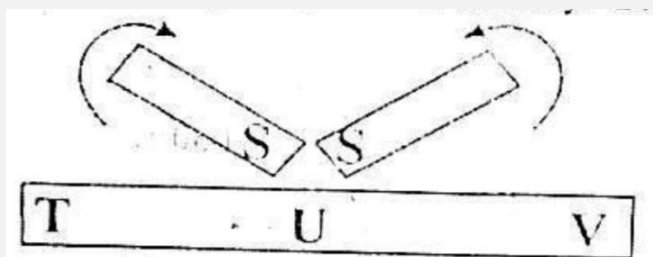
In the diagram above, if the south-poles of two magnets stroke a steel bar, the polarities at T and V will respectively be _____

A. north and south.
B. south and south.
C. north and north.
D. south and north.

37. In homes, electrical appliances and lamps are connected in parallel because _____

A. less current will be used
B. less voltage will be used.
C. parallel connection does not heat up the wires
D. series connection uses high voltage

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

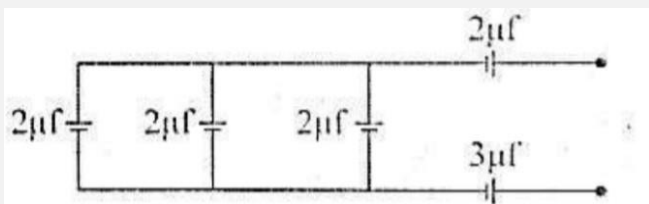A. $8rads^{-1}$

B. $4rads^{-1}$

C. $1rads^{-1}$

D. $2rads^{-1}$

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

A. 100N

B. 90N

C. 80N

D. 120N

40.

Calculate the effective capacitance of the circuit above.

A. 4µf

B. 3 µf

C. 2 µf

D. 1 µf

JAMB PHYSICS PAST QUESTIONS (PT.9)

1. The force required to make an object of mass m, travelling with velocity v, turn in a circle of radius r is _____

A. mr^2/v
B. mv^2/r
C. mr/v
D. mv/r^2

2. An ice cube floats in a glass of water filled to the brim. What happens when the ice melts?

A. There is a drop in the level of water in the glass due to condensation on the outside
B. The water level remains the same
C. The water in the glass overflows
D. The level of water drops because melted ice occupies less volume

3. A 500kg car which was initially at rest travelled with an acceleration of 5m sec^{-2}, its

kinetic energy after 4 seconds was _____

A. 10^5J
B. 2.5J
C. 2×10^3J
D. 5×10^3J

4. Which if the following are true of atoms?

A. Atoms are indestructible
B. The number of protons equals the number of electrons
C. Atoms of different substances have different weight
D. All of the above

5. A pressure cooker saves both time and fuel in cooking because inside the cooker, the _____

A. pressure is constant
B. boiling of water is raised
C. heated is completely trapped
D. temperature is evenly distributed

6. A vapour is said to be saturated when _____

A. more molecules return to the liquid than leave it

B. the vapour pressure is atmospheric

C. a dynamic equilibrium exists between the liquid molecule and the vapour molecule at a given temperature

D. the temperature of the vapour varies

7. The following types of waves are all transverse except _____

A. light waves

B. radio waves

C. surface waves on water

D. sound waves

8. Which of the circuits illustrated below will give a total resistance of 1Ω?
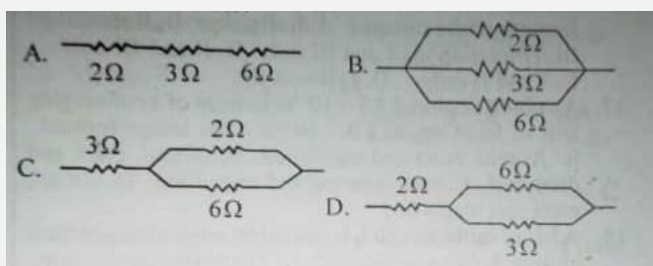
9. A ship travelling towards a cliff receives the echo of its whistle after 3.5 seconds. A short while later, it receives the echo after 2.5 seconds. If the speed of sound in air under the prevailing conditions is $250ms^{-1}$, how much closer is the ship to the cliff?

A. 125m

B. 10m

C. 175m

D. 350m

10. For which of the underlisted quantities is the derived unit ML^2T^2 correct?

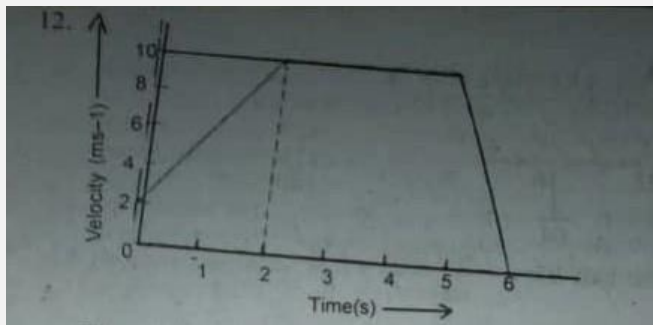   I.   *Moment of a force*

   II.   *Work*

   III. *Acceleration*

A. I only

B. I and II

C. III only

D. II only

11. Radio waves have a velocity of 3 x 10^8ms^{-1}. A radio station

sends out a broadcast on a frequency of 800 KHz. The wavelength of the broadcast is _____

A. 240.0m

B. 267.0ra

C. 375.0m

D. 37.5m

12.


The graph in the diagram above describes the motion of a particle. The acceleration of the particle during the motion is _____

A. $0.00ms^{-2}$

B. $0.25ms^{-2}$

C. $8.00ms^{-2}$

D. $4.00ms^{-2}$

13. Water shows anomalous behaviour _____

A. below 0°C

B. above 100°C

C. at exactly 4°C

D. between 0°C and 4°C

14. A uniform metre rule QR is balanced on a knife edge which is 55cm from R. When a mass of 10g is hung at P as shown below, the mass of the metre rule is _____
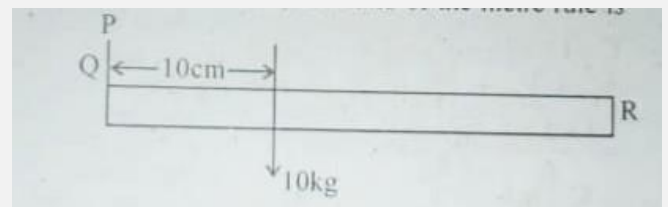
A. 70g

B. 350g

C. 550g

D. 35g

15. The vacuum in a thermos flask helps to reduce heat transfer by _____

A. convection and radiation

B. convection and conduction

C. conduction and radiation

D. radiation only

16. Which of the following phenomena explains the formation of a mirage?

I.   Reflection
II. Refraction
III. Diffraction

A. I and III only

B. II and III only

C. I and II only

D. I, II and III

17. An object is placed 5.6×10^{-4}m in front of a converging lens of focal length 1.0×10^{-n}m. The image formed is _____

A. real, erect and magnified

B. virtual, erect, and diminished

C. real, inverted, and magnified

D. virtual, erect, and magnified

18. A bar of initial length l_0 is heated through a temperature change Δt to a new length l. The linear expansivity, $\propto$, of the bar is _____

A. $\dfrac{l-l_0}{l\Delta t}$

B. $\dfrac{l-l_0}{l_0\Delta t}$

C. $l_0(l + \Delta l)$

D. $\dfrac{l-l_0}{l(+\Delta t)}$

19. A moving coil galvanometer of 300Ω resistance gives full scale deflection for 1.0mA. The resistance, R, of the shunt that is required to convert the galvanometer into a 3.0A ammeter is _____

A. 899.70Ω

B. 0.10Ω

C. 10.00Ω

D. 0.01Ω

20. Which of the following arrangement of the electromagnetic spectrum is in ascending order of wavelengths?

A. gamma rays, ultraviolet rays, x-rays, infra-red rays

B. infra-red rays, ultraviolet rays, x-rays, gamma rays

C. gamma rays, x-rays, ultraviolet rays, infra-red rays

D. gamma rays, ultraviolet rays, infra-red rays, x-rays

21. An aeroplane lands on a runway at speed of $180Kmh^{-1}$ and is brought to a stop uniformly in 30 seconds. What distance does it cover in the runway before coming to rest?
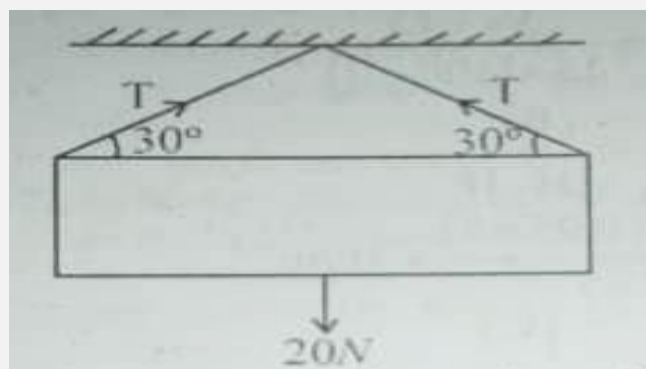
A. 360m

B. 540m

C. 957m

D. 750m
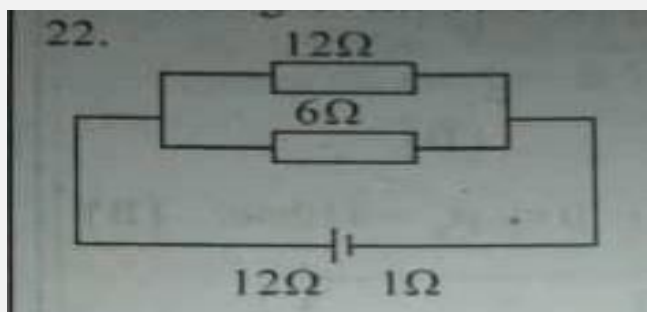
In the circuit diagram, calculate the current in the 12Ω resistor if the cell has an e.m.f of 12V and an internal resistance of 1Ω.

A. 2.4A

B. 1.0A

C. 1.6A

D. 0.8A

23.

The value of T in the diagram is

_____

A. 10.0N

B. 40.0N

C. 20.0N

D. 111.8N
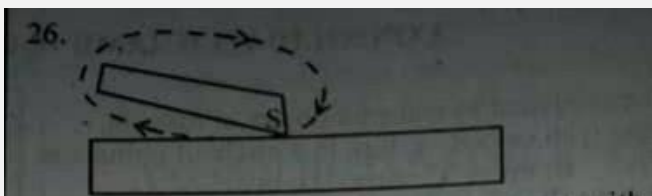
24. At what respective value of x, y, and z would the unit of force, the newton, be dynamically equivalent to $M^xL^yT^z$?

A. -1, 1, 2

B. 1, -1, 2

C. 1, 1, -2

D. -1, 1, -2

25. A 500W heater is used to heat 0.6kg of water from 25 to 100⁰C in t_1 seconds. If another 1000W heater is used to heat 0.2kg of water from 10⁰C to 100⁰C in t_2 seconds, find $\frac{t_1}{t_2}$

A. 50

B. 1/5

C. 5/4

D. 5

The diagram above shows a magnet with its south pole moved along a soft-iron bar PQ in the direction as shown. After some time, the poles at Q respectively are _____

A. North-South

B. North-North

C. South-North

D. South-South

27. A gas would serve as an electrical conductor under _____

A. reduced pressure and reduced potential

B. increased magnetic field

C. reduced pressure and high current

D. exposure to visible light
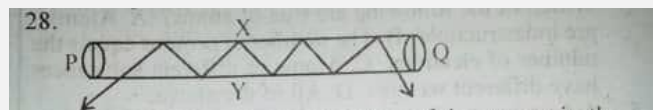
If current flows in the direction of the arrows in the solenoid above, the North pole is at _____

A. P

B. Q

C. X

D. Y

29. The magnetic force on a charged particle moving with velocity is _____

A. proportional to the velocity v only

B. independent of the magnitude of the charge

C. proportional to both the magnitude of the charge and the velocity v

D. proportional to the magnitude of the charge only

30. The eye controls the amount of light reaching the retina by adjusting the _____

A. retina

B. optic nerve

C. cornea

D. iris

31. A satellite is in a parking orbit if its period is _____

A. equal to the period of the earth

B. more than the period of the earth

C. less than the period of the earth

D. the square of the period of the earth

32. What types of mirrors are capable of producing parallel beams of light such as those arising from the headlamps of a car?

A. cylindrical mirrors

B. spherical mirrors

C. plane mirrors

33. A body of mass 36kg falls through a viscous liquid which offers a drag force of 260N on the body. The upthrust of the body at terminal velocity is _____
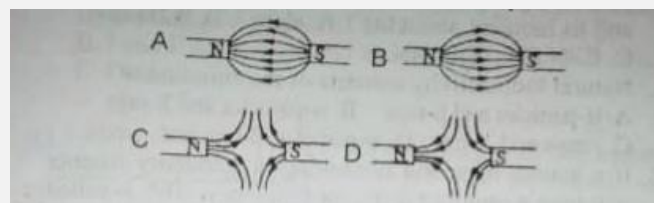
A. 310N

B. 50N

C. 620N

D. 100N

34. Which of the following diagrams represent the magnetic field of two isolated unlike poles?

35. Lenz's law is a law of the conservation of _____

A. momentum
B. energy
C. electric current
D. electric charge

36. Counting of currency notes with moist fingers is based on the principle of _____

A. diffusion
B. cohesion
C. viscosity
D. adhesion

37. If negative charges are induced on an electroscope and a positively charged rod is brought near the cap of the electroscope, the leaves will _____

A. become negatively charged
B. become positively charged
C. close up
D. open further

38. One special advantage of alcohol over mercury as a thermometric liquid is its _____

A. low density
B. low boiling point
C. high specific heat capacity
D. low freezing point

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

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

40. 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. zero

B. negative

C. positive

D. average

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!

1. A few grains of table salt were put in a cup of cold water, kept at constant temperature and left undisturbed. Eventually all the water tasted salty. This action is due to _____

A. convection
B. osmosis
C. capillarity
D. diffusion

2. The force required to make an object of mass m, travelling with velocity v, turn in a circle of radius r is _____

A. mv^2/r
B. mr^2/v
C. mr/v
D. mv/r^2

3. A machine gun with a mass of 5kg fires a 50g bullet at a speed of $100ms^{-1}$. The recoil speed of the machine gun is _____

A. $0.5ms^{-1}$

B. $1.5ms^{-1}$
C. $1ms^{-1}$
D. $2ms^{-1}$

4. If in a simple pendulum experiment, the length of the inextensible string is increased by a factor of four, its period is increased by a factor of _____

A. 4
B. $\pi/2$
C. 1/4
D. 2

5. In what range of temperature is the expansion of water anomalous?

A. $+208^0C$ to $+212^0C$
B. -80^0C to -76^0C
C. 0^0C to $+4^0C$
D. -4^0C to 0^0C

6. Which of the following statements about radioactivity is true?

I. *Alpha particle is positively charged*

II. *Beta particle is negatively charged*

III. *Gamma rays are neutral*

IV. *Beta particle has the same mass as Helium atom*

V. *Gamma ray is charged*

A. I, II, III, IV only

B. I, II, III only

C. IV and V only

D. I, II, V only

7. In the study of Physics, temperature and heat are often confused with each other. Which of the following statements correctly defines these two elements?

A. Temperature is a measure of the average kinetic energy of the molecules of a substance

B. Heat is a measure of the total kinetic energy of the molecules in a system

C. Different materials require different amount of heat to cause a given change in temperature

D. All of the above

8.
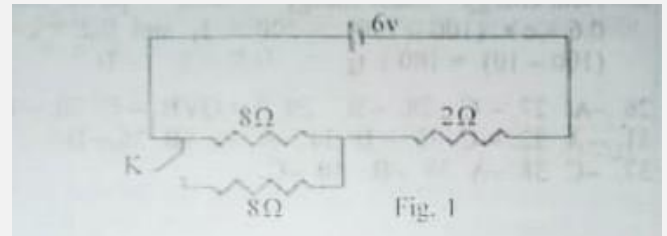
Fig. 1

The effect of closing the key K in the circuit shown in Fig. 1 would be to _____

A. increase the current by 0.4A

B. reduce the current by 0.4A

C. increase the current by 0.6A

D. reduce the current by 0.6A

9. Which of the following statements on the use of X-rays is incorrect? X-rays are used _____

A. in hospitals to obtain photographs of tissues and bones in the body

B. for the treatment of malignant growths like cancer cells

C. in detecting fingerprints

D. to reveal hidden flaws in metal casings and welded joint work of art

10.
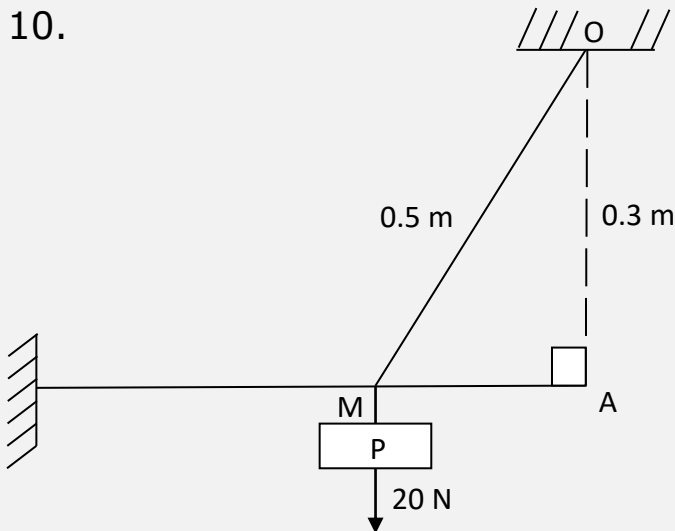
In the above diagram MN is perpendicular to ON and MP. What is the difference between the moment about N of the force of 20N applied along MP and its moment about O?

A. zero

B. 0.2Nm

C. 0.4Nm

D. 0.8Nm

11. Natural radioactivity consist of the emission of _____

A. ∝-particles and β-rays

B. ∝-particles and x-rays

C. γ-rays and x-rays

D. ∝-particles, β-rays and γ-rays

12. If a source of sound is moving, a stationary listener will hear a sound of different frequency. This is called _____

A. doppler effect

B. resonance

C. ultrasound

D. refraction

13. Which of the following can be described as high tension transmission?

A. high resistance and low voltage

B. low current and high voltage

C. high current and low voltage

D. high current and low resistance

14. What is the cost of running five 50W lamps and four 100W lamps for 10 hours if electrical energy costs 2 kobo per kWh?

A. ₦0.65

B. ₦0.39

C. ₦3.90

D. ₦0.13

15. The mass of a proton is approximately equal to that of _____

A. an ∝-particle

B. a β-particle

C. a neutron

D. an electron

16. A transformer has 300 turns of wire in the primary coil and 30 turns in the secondary coil. If the input voltage is 100 volts, the output voltage is _____

A. 5 volts

B. 10 volts

C. 15 volts

D. 20 volts

17. A solid weighs 4.8g in air, 2.8g in water and 3.2g in kerosene. The ratio of density of the solid to that of the kerosene is _____

A. 2

B. 3/2

C. 2/3

D. 3

18. One of the following readings represents the measurement of the length of a metal rod using vernier callipers. Taking the reading accuracy into consideration, the most likely one is _____

A. 5.16 cm

B. 5.165 cm

C. 5.0 cm

D. 5.160 cm

19. When a wave sound passes from air into water its _____

A. speed and frequency increases but its wavelength remains the same
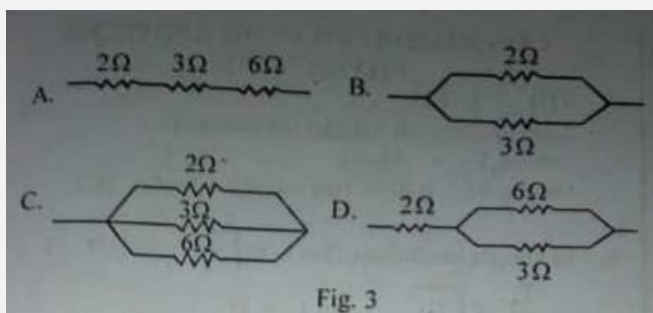
B. speed and wavelength increase but its frequency remains the same

C. speed decreases

D. speed increases but its frequency and wavelength decreases

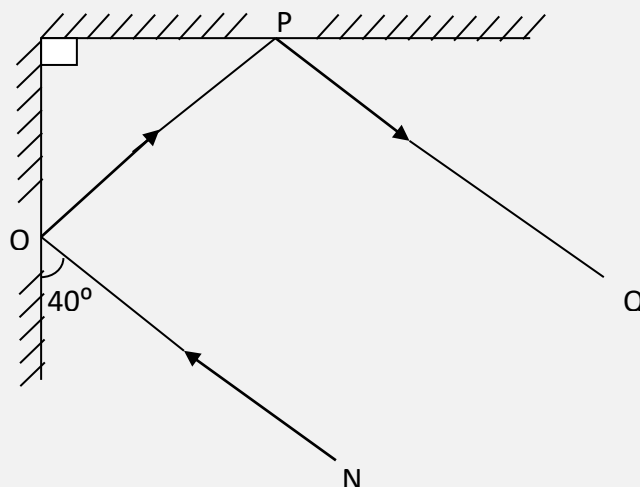20. Which of the circuits illustrated below will give a total resistance of 1Ω?

Fig. 3

21. A convex mirror is used as a driving mirror because _____

   I.   *its image is erect*

   II.   *it has a large field of view*

   III. *it has a long focal length*

A. I and III only

B. I and II only

C. II and III only

D. I, II, and III

E. I only

22.

Two mirrors of the same lengths are arranged as shown in the diagram above. A ray of light NO strikes the system at O and emerges along PQ. The emergent ray has been deviated through _____

A. 220⁰

B. 200⁰

C. 210⁰

D. 180⁰

23. A magnetic needle is suspended first at the earth's north magnetic pole then at a point on the magnetic equator.

The respective angles between the needle and the horizontal are _____

A. 0⁰ and 0⁰

B. 60⁰ and 60⁰

C. 90⁰ and 90⁰

D. 90⁰ and 0⁰

24. A hydrometer is an instrument for measuring the _____

A. depth of water in a vessel

B. relative density of a liquid by the method of floatation

C. relative density of a liquid by finding the apparent loss in weight

D. relative humidity of the air

25.
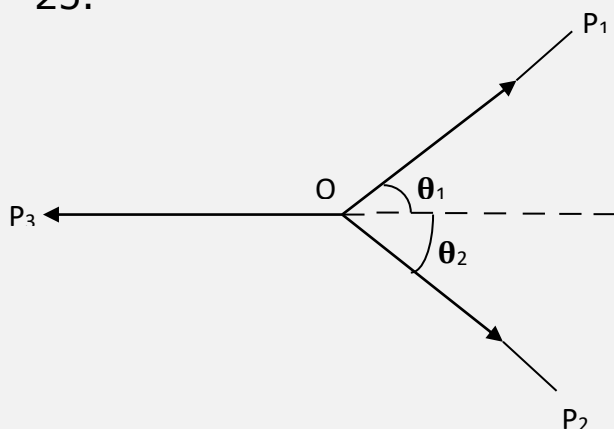
Consider the three forces acting at O and in equilibrium as shown above. Which of the following equations is/are CORRECT?

I. $P_1 \cos \theta_1 = P_1 \cos \theta_2$

II. $P_3 = P_1 \cos \theta_1 + P_2 \cos \theta_2$

III. $P_1 \sin \theta_1 = P_2 \sin \theta_2$

A. I only

B. II only

C. III only

D. I, II, and III

26. The refractive index of a liquid is 1.5. if the velocity of light in vacuum is $3.0 \times 10^8 ms^{-1}$, the velocity of light in the liquid is _____

A. $1.5 \times 10^8 ms^{-1}$

B. $2.0 \times 10^8 ms^{-1}$

C. $3.0 \times 10^8 ms^{-1}$

D. $4.5 \times 10^8 ms^{-1}$

27. A ship travelling towards a cliff receives the echo of its whistle after 3.5 seconds. A short while later, it receives the echo

after 2.5 seconds. If the speed of sound in air under the prevailing condition is 250ms^{-1}, how much closer is the ship to the cliff?

A. 10m
B. 350m
C. 175m
D. 125m

28. Which of the following statements about defects of vision is/are CORRECT?

 I.   For a long sighted person, close objects appear blurred
 II. For a short sighted person, distant objects appear blurred
 III. Short sight is corrected by using a pair of converging lenses

A. I only
B. II only
C. I and II only
D. II and III only

29. Which the following conditions are necessary and sufficient for total internal reflection to take place at the boundary between two optical media?

 I.   Light is passing from optically denser medium to optically less dense medium
 II. Light is passing from optically less dense medium to optically denser medium
 III. Angle of incidence is greater
 IV. Angle of incidence is lesser

A. I and II only
B. II and III only
C. III and IV only
D. I and III only

30. The linear expansivity of brass is 2 x 10^{-5} $^{\circ}C^{-1}$. If the volume of a piece of brass is 10cm^3 at 0°C, what will be its volume at 100°C?

A. 10.06cm^3

B. 10.04cm^3

C. 10.02cm^3

D. 10.20cm^3

31. The lower and upper fixed points marked on a mercury-in-glass thermometer are 210mm apart. The end of the mercury column in the tube is 49mm above the lower fixed point in the room. What is the temperature of the temperature of the room in degree Celsius?

A. 55.3ºC

B. 30.43ºC

C. 49.0ºC

D. 16.43ºC

32. Heat is supplied uniformly at the rate of 100W to 1.0 x 10-2kg of a liquid for 20 seconds. If the temperature of the liquid rises by 5ºC, then the specific heat capacity of the liquid is _____

A. 2.0 x 10^{2}J kg^{-1} K^{-1}
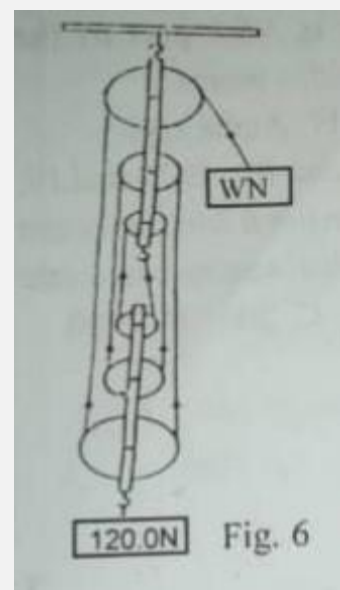
B. 2.0 x 10^{2}J kg^{-1}

C. 4.0 x 10^{4}J kg^{-1} K^{-1}

D. 4.0 x 10^{4}J kg^{-1}

33. Two divers G and H are at depths 20m and 40m respectively below the water surface in a lake. The pressure on G is P_1, while the pressure on H is P_2. If the atmospheric pressure is equivalent to 10m^2 of water, then the value of P_2/P_1 is _____

A. 0.50

B. 0.60

C. 1.67

D. 2.00

34.

120.0N Fig. 6
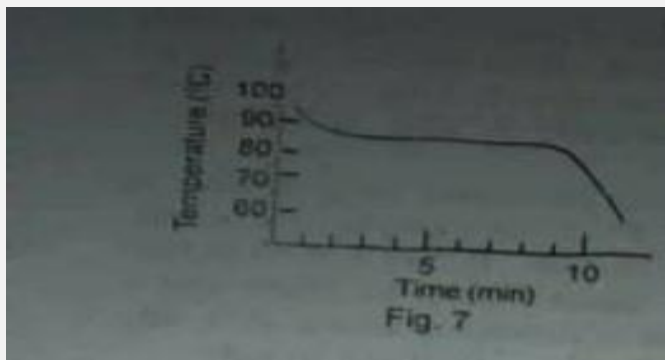
The diagram above represents a block-and-tackle pulley system on which an effort of W Newtons supports a load of 120.0N. if the efficiency of the machine is 40⁰, then the value of W is _____
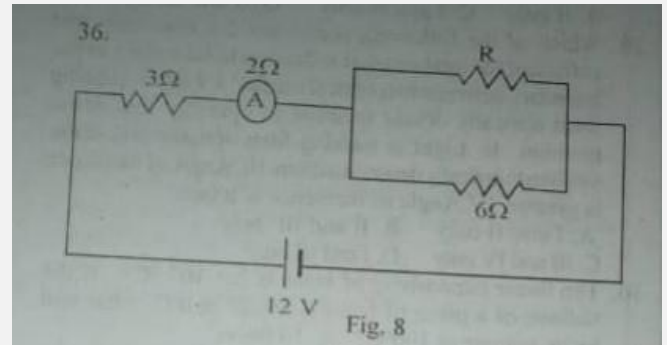
A. 28.0N

B. 48.0N

C. 288.0N

D. 50.0N

35.

Fig. 7

In an experiment in which molten naphthalene is allowed to cool, the cooling curve in the diagram above was obtained. The temperature 80°C is known as the _____

A. cooling temperature

B. boiling point

C. melting point

D. vapourization point

Fig. 8

In the above diagram, the value of R is _____

A. 3Ω

B. 6Ω

C. 4Ω

D. 5Ω

37. Which of the following instruments consumes the highest current?

Instrument	Voltage Rating	Power Rating
A. Electric iron	250V	1kW
B. Television set	220V	110kW
C. Torch light	6V	30kW
D. Immersion heater	110V	500kW

38. In which of the following diagram is the length of the tube equal to one wavelength?

D. 2400
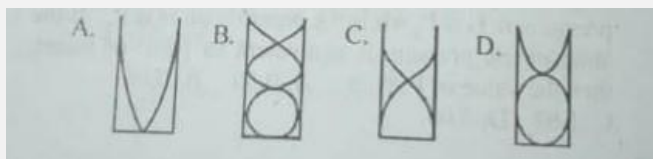
39. Which of the following pairs is not part of electromagnetic spectrum?

   I.   *Radio waves*
   II.   *Beta rays*
   III. *Gamma rays*
   IV. *Alpha rays*

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

40. A substance has a half of 3 min. After 6 min, the count rate was observed to be 400. What was its count rate at zero time?

A. 1600
B. 1200
C. 200

~~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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