

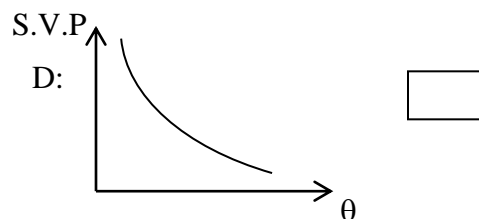
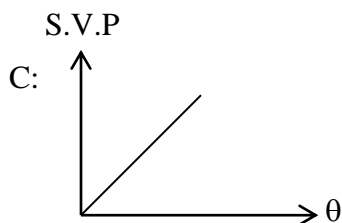
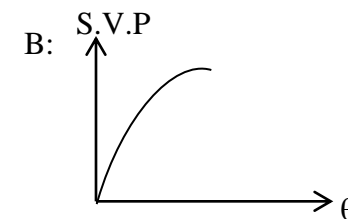
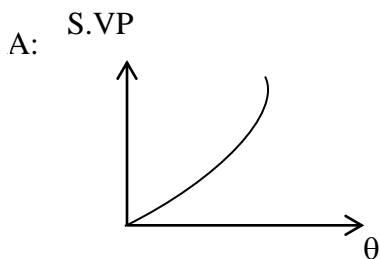
SECTION A:

1. A perfume sprayed at one corner of a room spreads physically to the entire room through the process of
 A: Conduction B: Brownian C: Radiation D: Diffusion

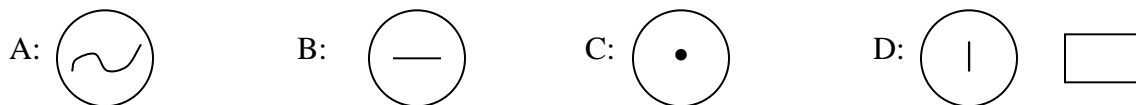
2. When a green plant with white flowers is placed in a yellow light, the plant will appear
 A: green leaves, yellow flowers B: yellow leaves, green flowers
 C: green leaves, red flowers D: red leaves, green flowers.

3. Find the wavelength of the wave of frequency 680HZ and velocity 170ms⁻¹
 A: 115600m B: 510m C: 4m D: 0.25m

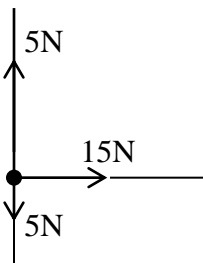
4. Which of the following graphs shows the correct relationship between saturated vapour pressure (S.V.P) and temperature (θ)



5. Which of the following diagrams show the correct display on the screen of a C.R.O when the d.c voltage is applied across the y- plates and the time base is switched on



6. Figure below shows three forces acting on the body



What is the net force on the body?

- A: 0N B: 10N C: 15N D: 25N

7. A charge of 1.5C crosses a point in a circuit in 0.5 seconds. What is the current in the circuit?

- A: 0.3A B: 3.0A C: 4.5A D: 7.5A

8. An oil drop of volume $9 \times 10^{12} \text{ m}^3$ when allowed spread on the surface of water forms a circular patch of area $5 \times 10^{-3} \text{ m}^2$. Find the thickness of the oil molecule.

- A: $4.50 \times 10^{-15} \text{ m}$ B: $1.8 \times 10^{-15} \text{ m}$
 C: $1.8 \times 10^{-9} \text{ m}$ D: $0.56 \times 10^{-9} \text{ m}$

9. An electroscope is negatively charged by induction. This means that it has

- A: lost protons B: lost electrons
 C: gained protons D: gained electrons

10. The acceleration due to gravity on the earth is 10 ms^{-2} and on the mars it is 4 ms^{-2} . A space probe has a mass of 100kg on earth. On mars;

- A: its mass and weight will decrease
 B: its mass will be smaller but the weight will be the same
 C: its mass will be smaller but the weight will have increased
 D: its mass will be the same but its weight will have decreased.

11. Bismut – 210 decays to $\frac{1}{64}$ th of its original activity after 30 days. The half life of Bismut – 210 is

- A: 5days B: 6days C: 8days D: 64days

12. A spring of natural length 1.5m is extended by 0.005m when a force of 0.8N is applied on it. What will be its length when a force of 3.2N is applied on it.

- A: 1.205m B: 1.48m C: 1.504m D: 1.52m

18.

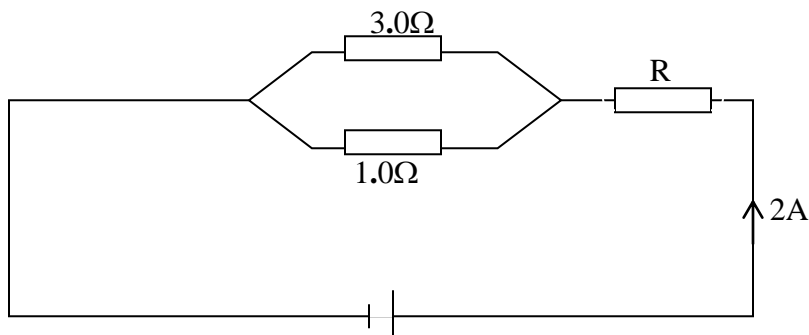


Fig 1 above shows three resistors connected in a circuit. What is the effective resistance of the circuit, if the p.d across the resistor R is 8V.

A: 9.00Ω

B: 6.00Ω

C: 4.75Ω

D: 2.00Ω

19. The velocity of light in air is $3 \times 10^8 \text{ ms}^{-1}$ and the velocity of light in water is $2.25 \times 10^8 \text{ ms}^{-1}$. The refractive index of water is

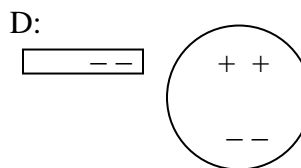
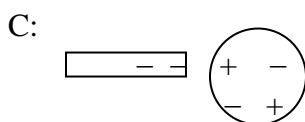
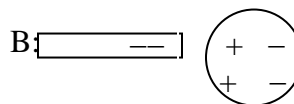
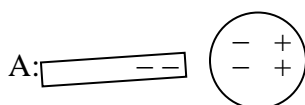
A. $\frac{4}{3}$

B. $\frac{3}{4}$

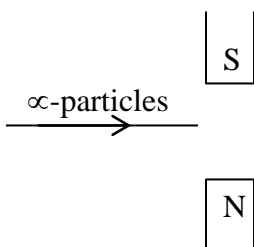
C. 3×2.25

D: $3 + 2.25$

20. A negatively charged rod is brought close to an uncharged metal sphere which is held on an insulated stand. Which diagram shows the best distribution of charge on the sphere when the rod is near

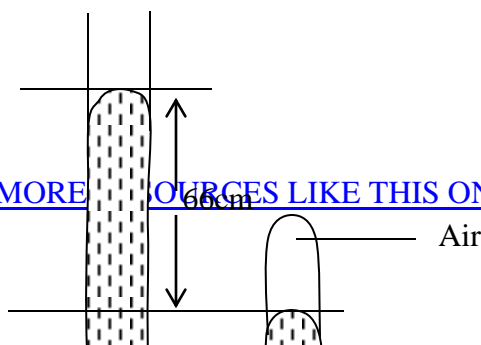


21. Peter shouts loudly in front of a concrete wall. After 1.4 seconds, he heard the echo of his voice. If the speed of sound in air is 330ms^{-1} , Find the distance between Peter and the wall.
 A: 110m B: 231m C: 308m D: 462m
22. When a body in stable equilibrium is tilted slightly
 A: the position of its centre of gravity is lowered.
 B: The position of its centre of gravity is raised.
 C: the position of its centre of gravity does not change
 D: it topples over.
23. A stream of α - particles is directed into a magnetic field between two poles of a permanent bar magnet as shown below.



When α - particles enter the region of the magnetic field, they are

- | | | |
|---------------------------------|---------------------------------|--------------------------|
| A: Deflected into the paper | B: Deflected towards the N-pole | <input type="checkbox"/> |
| C: Deflected towards the S-pole | D: Deflected out of the paper | <input type="checkbox"/> |
24. A rider on a horse back falls forward when the horse suddenly stops. This is due to
 A: Inertia of the horse B: inertia of the rider
 C: large weight of the horse. D: losing of the balance.
25. when all the heat energy is removed from substance, its temperature is called
 A: melting temperature B: Absolute zero temperature
 C: Kelvin temperature D: Celsius temperature
26. The density of a solid is much greater than that of a gas because the molecules of a solid are:
 A: closely packed together B: in random motion
 C: vibrating rapidly D: in regular pattern.
27. Fig 2 below shows air trapped by a column of mercury in a J-tube. the atmospheric pressure is 76cm Hg.



C: remains the same

D: is halved .

34. The source of electrons in a simple cell is

A: sulphuric acid

B: zinc plate

C: potassium dichloride

D: copper plate

35. Calculate the critical angle of an ice block of refractive index 1.31

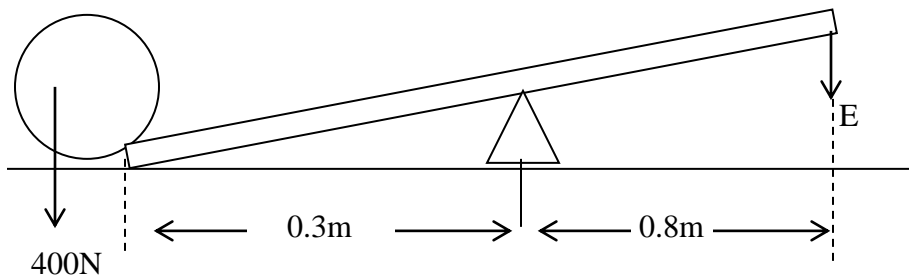
A: 42°

B: 50°

C: 38°

D: 36°

36. Figure 3 below shows a plank of wood used to move a load of 400N



Calculate the value of E

A: 1066.4 N

B: 400.0N

C: 150.0N

D: 50.0N

37. When a tightly corked bottle full of water is left over night in the ice chamber of a refrigerator, it will break because

A: its outside contracts faster than the inside

B: water expands when it turns into ice.

C: water contracts and creates a vacuum in the bottle

D: ice formed in the chamber squeezes it.

38. A mass is projected vertically upwards with a velocity of 10ms^{-1} . What is the maximum height reached by the mass?

A: 1.0m

B: 5.0m

C: 10.0m

D: 100.0m

39. When a 4Ω resistor is connected across the terminals of a 24V battery the number of coulombs passing through the resistor per second is

A: 96

B: 6

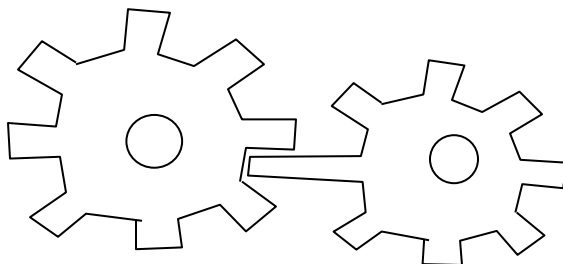
C: 28

D: 0.167

40. The directions of the induced current in a conductor moving in a magnetic field can be predicted by applying
- A: Fleming's right hand rule
 - B: Fleming's left hand rule
 - C: Lenz's law
 - D: Faraday's law.

SECTION B;

41. The figure 4 below shows a gear system in which a load of 1800N can be raised by an effort of 800N



- (a) What is the velocity ratio of this gear system?

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- (b) Calculate the efficiency of the system (2 marks)

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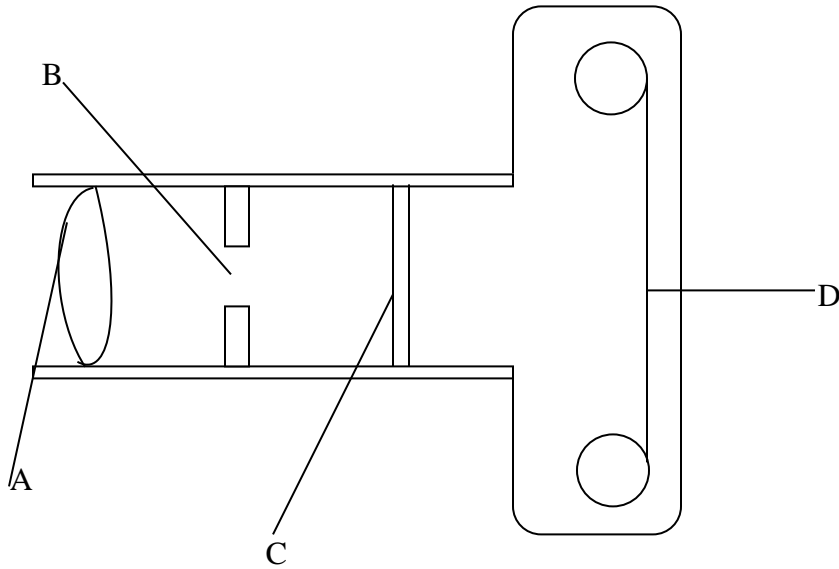
42. (a) State the law of conservation of momentum . (1 mark)

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(b) A bus of mass 8000kg traveling at 10ms^{-1} collides head on with a car of mass 2000 kg moving in opposite direction at 20ms^{-1} . After collision the vehicles stick together. Find their common velocity . (3 marks)

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43. The figure 5 below shows a lens camera



(a) Name the parts labeled

A

B

C

D

(2 marks)

(b) State the functions of the parts labeled

B

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C.....

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(2 marks)

44. An image, the same size as an object but inverted is formed on the screen placed 6cm from a lens.

(a) State with a reason the type of lens used.

(2 marks)

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(b) Draw a ray diagram to show the object and its image.

(2 marks)

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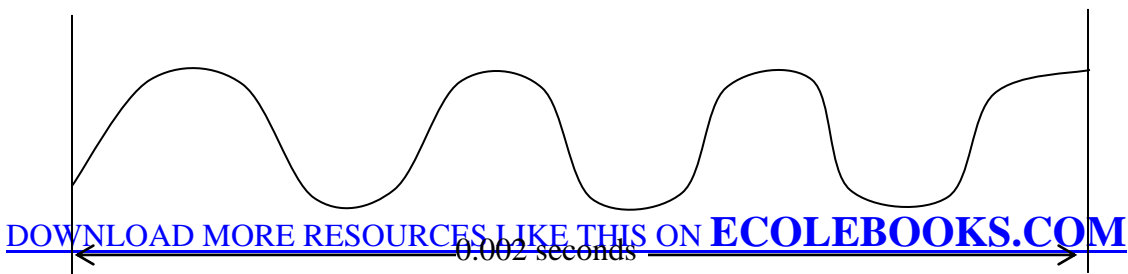
45. (a) What do you understand by the period of a wave?

(1 mark)

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(b) Figure 6 below shows a shape of a wave



(i) How many cycles are shown above? (1 mark)

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(ii) What is the frequency of the wave?

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46. (a) State Boyle's law . (2 marks)
(1 mark)

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(b) A gas of volume 200cm³ is collected at a temperature of 20°C and pressure of 700mmHg

Calculate the volume of the gas at standard temperature and pressure (s.t.p)
(3 marks)

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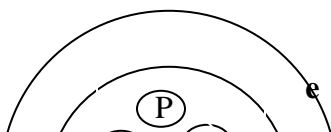
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47. (a) Define the term isotope. (1 mark)

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(b) Figure 7 shows the composition of a certain atom



State the atomic and mass number of the atom. (2 marks)

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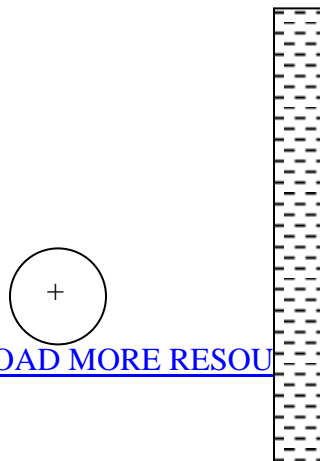
(c) The isotope ${}_{92}^{238}\text{U}$ decays by alpha emission to an isotope of Thorium (Th). Write down the equation for the decay process. (1 mark)

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48. (a) Define the term electric field. (1 mark)

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(b) The figure 8 below shows an isolated positive charge placed at a small distance from a negatively charged plate.



Sketch the electric field pattern for the set up. (2 marks)

(c) State two properties of electric field lines.

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49. (a) What is meant by e.m.f of a cell? (1 mark)

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(b) The p.d across the terminals of a cell is 1.5V when there is no current flowing in the circuit. when current of 0.50A flows in the circuit the p.d. falls to 1.3V.

Calculate

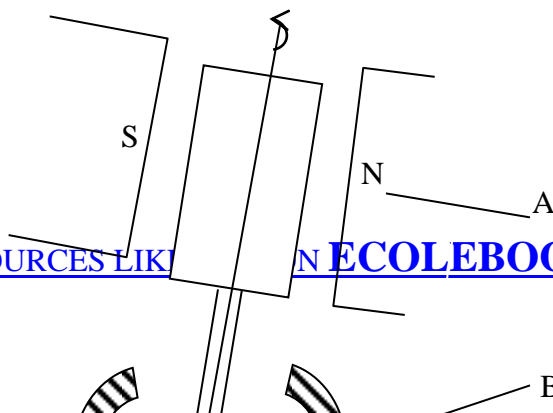
(i) internal resistance of the cell (1 ½ marks)

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(ii) external resistance connected to the cell. (1 ½ marks)

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50. Figure 9 below shows a rectangular coil rotating between the poles of a permanent magnet.



(a) Name the parts labeled

A

B

C.....

D.....

(b) What is the function of the part labeled C?

(1 mark)

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(c) What is the type of generator represented by the set up?

(1 mark)

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END