

SCIENCE

34. The hydrogen ion concentration of a solution is 1×10^{-9} m.

- (a) What is the pH of the solution?
 (b) Is the given solution acidic? or basic?

Ans:

(a) $\text{pH} = -\log_{10}[\text{H}^+]$
 $\text{pH} = -\log_{10}[1.0 \times 10^{-9}]$
 $\text{pH} = -[\log_{10} 1.0 + \log_{10} 10^{-9}]$
 $\text{pH} = -[0 - 9 \log_{10} 10]$
 $\text{pH} = +9$
 $\text{pH} > 7$

(b) The give solution is a base.

35. Why does the colour of copper sulphate change when an iron nail is kept in it? - Explain.

Ans:

Iron is more reactive than Copper.



Iron displaces copper from CuSO_4 solution.

36. To design the body of an aircraft, aluminium alloys are used. Given reasons.

Ans:

Aluminium alloys are, Light, Highly tensile and corrosion resistant.

37. Any metal mixed with mercury is called an _____.

The amalgam used for dental filling is _____ (Ag-Sn / Cu - Sn)

Ans:

Amalgam, Ag - Sn amalgam

38. Write the common name and IUPAC name of the following.

- (a) $\text{CH}_3\text{CH}_2\text{CHO}$ (b) CH_3COOH

Ans:

	Common Name	IUPAC Name
(a)	Propionaldehyde	Propanal
(b)	Acetic acid	Ethanoic acid

39. A 5N force acts on a 2.5 Kg mass at rest, making it accelerate in a straight line. What is the acceleration of the mass?

Solution:

According to Newton's Second law of motion

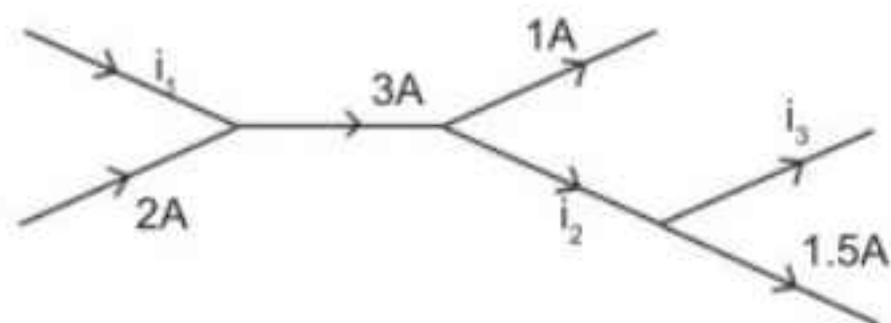
$$F = m a$$

$$F = 5 \text{ N}; m = 2.5 \text{ kg}$$

$$\therefore a = \frac{F}{m} = \frac{5}{2.5} = 2$$

Acceleration of the mass = 2 ms^{-2}

40. The figure is a part of a closed circuit the currents i_1 , i_2 & i_3 .



Solution:

$$i_1 + 2A = 3A$$

$$\therefore i_1 = 3A - 2A = 1A$$

$$i_2 = 3A - 1A = 2A$$

$$i_3 = i_2 - 0.5A = 1.5A$$

41. Match

Components	Symbols
(a) An electric Cell	
(b) Ammeter	
(c) Resistance	
(d) Voltmeter	

Ans:

Components	Symbols
(a) An electric Cell	
(b) Ammeter	
(c) Resistance	
(d) Voltmeter	

42. Fuse wire is made up of an alloy of _____, Which has high resistance and _____.

Ans:

37% Lead, 63% Tin; low

43. Correct the mistakes, if any in the following statements:

- (a) The magnetic field is a quantity that has magnitude only
 (b) The SI unit of focal length is dioptre

Ans:

- (a) The magnetic field is a quantity that has both magnitude and direction.
 (b) The SI unit of focal length is metre.

44. The focal length of a concave lens is 2 m. Calculate the power of the lens.

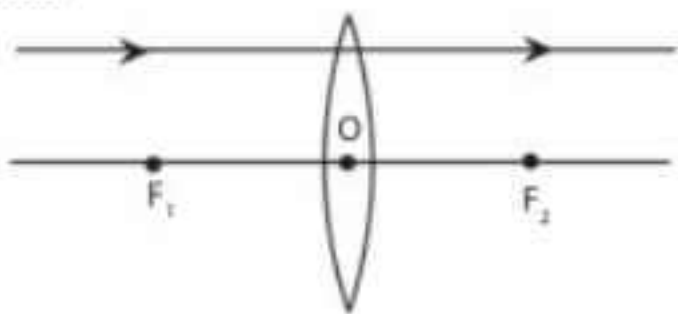
Ans:

Focal length of concave lens $f = -2 \text{ m}$

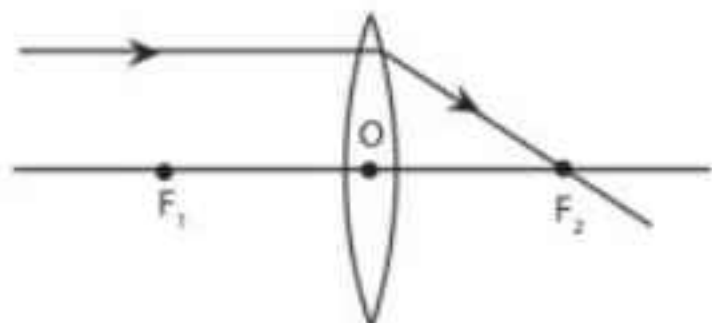
$$\text{Power of the lens, } p = \frac{1}{f} = \frac{1}{-2} = -0.5\text{D}$$

$p = -0.5$ Dioptre

45. Identify the mistakes and draw the correct ray diagram.



Ans:



Part III 4 × 5 = 20

Note : (i) Answer any four questions by choosing one question from each part.

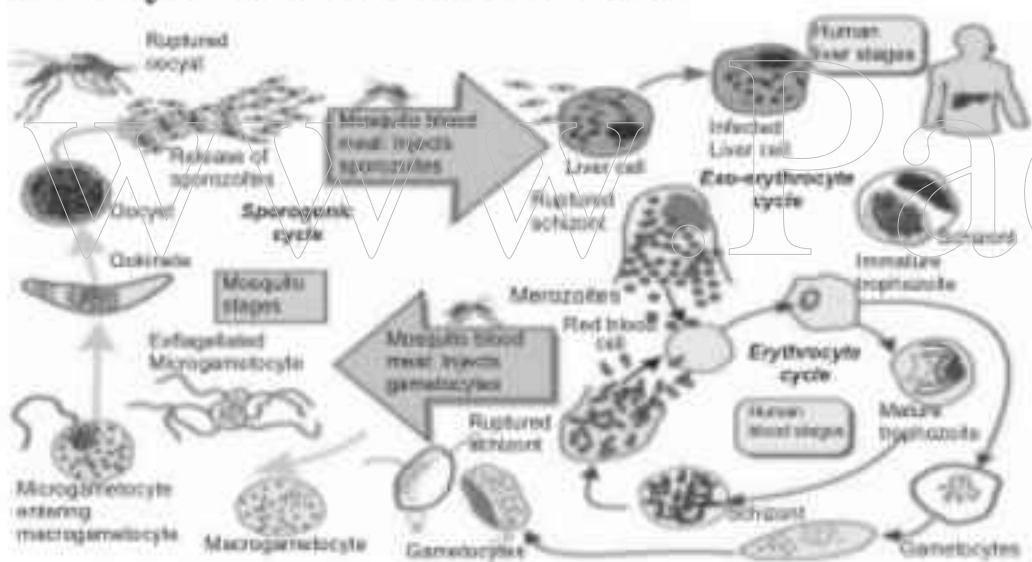
- (ii) Each question carries five marks.
- (iii) Draw diagrams wherever necessary.

Section - A

46. Describe the life - cycle of plasmodium in man.

Ans:

Life Cycle of Malarial Parasite:



(i) The sexual stage of Plasmodium takes place in female Anopheles mosquito whereas the asexual stage occurs in man.

(ii) When a female Anopheles mosquito bites an infected person, these parasites enter the mosquito and undergo further development in the body of the mosquito.

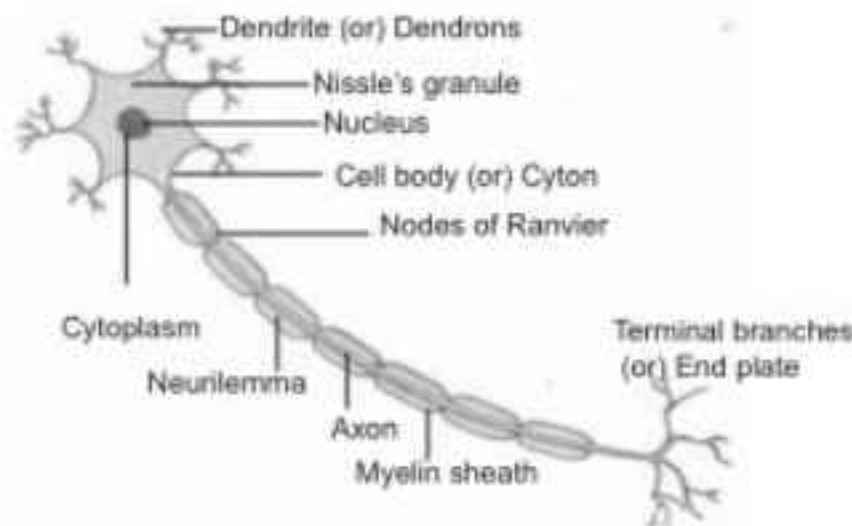
(iii) The parasites multiply within the body of the mosquito to form sporozoites that are stored in the salivary glands of the mosquito.

(iv) When these mosquitoes bite a healthy person, the sporozoites (the infectious stage) are introduced into his body. They multiply within the liver cells first and enter the Red Blood Cells (RBC) of man, resulting in the rupture of RBC.

(v) This results in the release of toxic substance called haemozoin which is responsible for the chill and high fever, recurring every three to four days.

47. Describe the structure of a neuron with the help of a neat labelled diagram.

Ans:



Nerve cells or neurons are the structural and functional units of the nervous system.

A nerve cell is a microscopic structure consisting of three major parts namely, cell body, dendrites and axon.

(i) **Cell body (or) cyton:** The cell structure is irregular in shape or polyhedral. It is also called cyton. Cell body contains cytoplasm with typical cell organelles and certain granular bodies called Nissle's granules. Nissle's granules are a group of ribosomes for protein synthesis.

(ii) **Dendrites or Dendrons :** These are short fibres which branch repeatedly and protrude out of the cell body. Dendrites transmit electrical impulses towards the cyton.

(iii) **Axon :** One of the fibres arising from the cell body is very long with a branched distal end and it is called Axon. The distal branch of the axon terminates in bulb-like structures called synaptic knob filled with chemicals called neuro transmitters. The cytoplasm of the axon is known as axoplasm. The axon which is covered by a myelin sheath is formed of many layers of Schwann cells. The outermost layer of Schwann cells is called Neurilemma. The gaps left by the myelin sheath are called Nodes of Ranvier. Neurilemma is discontinuous at Nodes of Ranvier. The myelin sheath ensures rapid transmission of electric impulses.

Section - B

48. Fruit is the product of fertilization. Represent the classification of fruits in a diagrammatic sketch.

Ans:

Yes, Some fruits develop without the act of fertilization. Such fruits are called Parthenocarpic fruits. e.g. seedless grapes, guava, etc.

Represent the classification of in a diagrammatic sketch.

