

SCIENCE AND TECHNOLOGY

Time allowed : 3 hours

Maximum Marks : 75

GENERAL INSTRUCTIONS :

1. The question paper comprises of **two** sections, A and B. You are to attempt both the sections.
2. The candidates are advised to attempt all the questions of Section A separately and Section B separately.
3. All questions are compulsory
4. There is no overall choice. However, internal choice has been provided in some questions. You are to attempt only one option in such questions.
5. Marks allocated to every question are indicated against it.
6. Question numbers **1-5** in Section A and **21-23** in Section B are very short answer questions. These are to be answered in **one word** or **one sentence**.
7. Question numbers **6-10** in Section A and **24-25** in Section B are short answer questions. These are to be answered in **30-40** words each.
8. Question numbers **11-17** in Section A and **26-29** in Section B are also short answer questions. These are to be answered in **40-50** words each.
9. Question numbers **18-20** in Section A and **30** in Section B are long answer questions. These are to be answered in **70** words each.

QUESTION PAPER CODE 31/1/1

SECTION - A

1. Give an example of photochemical reactions. 1
2. Name a metal which offers higher resistance to the passage of electricity than copper. 1
3. State a reaction in which SO_2 acts as an oxidising agent. 1
4. Where will the image be formed by concave mirror when an object is placed between the pole and the focus point of the mirror ? 1
5. Which has a higher resistance : a 50 W lamp bulb or a 25 W lamp bulb and how many times ? 1

6. How is plaster of Paris chemically different from gypsum ? How may they be interconverted ? Write one use of plaster of Paris. 2
7. Allotropy is a property shown by which class of substances, elements, compounds or mixtures ? Give one example of allotropy. 2
8. Draw diagrams to distinguish between 'equatorial orbit' and 'polar orbit' of artificial satellites of earth. 2
9. With respect to air the refractive indices of water and benzene are 1.33 and 1.50 respectively. Calculate the refractive index of benzene with respect to water. 2
10. What is the cause of release of unusually large energies in nuclear fission reactions ? How is the energy per fission calculated ? 2

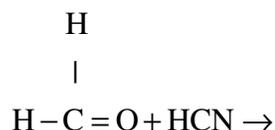
Or

What is a thermal neutron ? Draw a schematic diagram depicting fission of a U-235 nucleus on absorption of a thermal neutron.

11. (a) State the relation between hydrogen ion concentration of an aqueous solution and its pH.
 (b) The pH of an aqueous solution decreases from 3 to 2. Calculate how many times the hydrogen ion concentration of the solution will change. 3
12. Explain the following regarding the manufacture of ammonia by Haber's process, the reaction being :

$$\text{N}_2(\text{g}) + 3\text{H}_2(\text{g}) \rightleftharpoons 2\text{NH}_3(\text{g}) + \text{heat}$$
 (i) This reaction is carried out at a high temperature even though it is an exothermic reaction.
 (ii) To make ammonia, the mixture of N_2 and H_2 gases is passed over heated iron. 3
13. (i) Distinguish between an addition polymer and a condensation polymer.
 (ii) Choose one condensation polymer and one addition polymer from amongst the following :
 nylon, teflon, neoprene, polyester
 (iii) Write a chemical equation for the reaction involved in the formation of a polyamide. 3

14. (a) Write the chemical equation representing the reaction for the preparation of methanal from methanol.
- (b) What happens when methanal is mixed with :
- (i) Ammoniacal silver nitrate solution and the mixture is warmed.
- (ii) Fehling's reagent and the mixture is warmed.
- (iii) Complete the reaction equation :



3

Or

Write the formulae for the given compounds and name the functional groups present in each of them :

- (i) Ethanoic acid (ii) Propanone (iii) Nitromethane
15. A torch bulb is rated 2.5 V and 750 mA. Calculate (i) its power, (ii) its resistance and (iii) the energy consumed if this bulb is lighted for 4 hours. 3
16. Name three form in which energy from oceans is made available for use. What are OTEC power plants ? How do they operate ? 3
17. Describe briefly the Big Bang Theory of the origin of universe. 3
18. (a) Write chemical equations for the reactions involved in obtaining pure alumina from the mineral bauxite which has impurities of iron oxide and silica.
- (b) Draw a labelled diagram of the electrolytic tank cell used for the extraction of aluminium from alumina. 5

Or

- (a) What is corrosion of metals ? Name one metal which does not corrode and one which corrodes on being kept in atmosphere.
- (b) How will you show that the rusting of iron needs oxygen and moisture at the same time.
19. (a) Explain the following terms used in relation to defects in vision and corrections provided for them—
- (i) Myopia (ii) Astigmatism (iii) Bifocal lenses (iv) Far sightedness.
- (b) Describe with a ray diagram how a person with myopia can be helped by spectacles. 5

Or

- (a) What is a 'simple microscope' ? Draw diagrams to show the image formed by a simple microscope with the eye focussed—
(i) on near point (ii) at infinity.
- (b) What is the maximum magnification obtainable by a simple microscope ?
20. (a) What are 'magnetic field lines' ? How is the direction of a magnetic field at a point determined ?
- (b) Draw two field lines around a bar magnet along its length on its two sides and mark the field directions on them by arrow marks.
- (c) List any three properties of magnetic field lines. 5

SECTION -B

21. Write the expanded form of the abbreviation AIDS. 1
22. Why is one arm in sub-metacentric chromosome longer than the other ? 1
23. What is 'Green House Effect' ? 1
24. What is 'eutrophication' ? Write its two harmful effects. 2
25. List any four practices which help in protecting our environment. 2

Or

Describe any four modes of disposal of waste.

26. What is 'translocation' ? Why is it essential for plants ? Where in plants are the following synthesized : 3
(i) Sugars (ii) Hormones

Or

What is 'clotting of blood' ? Write a flow chart showing major events taking place in clotting of blood.

27. Draw a diagram of human brain and label on it the following of its parts : 3
(i) Cerebrum (ii) Meninges (iii) Medulla Oblongata (iv) Cerebellum
28. Differentiate between 'self pollination' and 'cross pollination'. Describe 'double fertilisation' in plants. 3
29. What is 'organic evolution' ? How do embryological studies provide evidence for evolution ? 3
30. Explain the process of 'photosynthesis' in plants. List four factors which influence this process and describe how each of them affects the rate of the photosynthesis process. 5

QUESTION PAPER CODE 31/1

SECTION - A

1. Biological reactions in our body depend on the presence of biocatalysts. What name is given to these catalysts ? How is their activity influenced by changes in temperature ? 1
2. Name two metals both of which are very ductile as well as very malleable. 1
3. Write the chemical equation to represent the reaction taking place when copper oxide is heated in a stream of hydrogen. 1
4. What are the values of (i) the angle of incidence, and (ii) the angle of reflection for normal incidence on a plane mirror surface ? 1
5. A wire of resistance 10 ohm is bent in the form of a closed circle. What is the effective resistance between the two points at the ends of any diameter of the circle ? 1
6. What happens when crystals of washing soda are left open in dry air ? What is this change named as ? Name two industries based on use of washing soda. 2
7. "Sulphuric acid is a dibasic acid." Write two reaction equations to justify this statement and name the reaction products in the two cases. 2
8. Explain the principle involved in the launching of artificial satellites. 2
9. Light enters from air into a glass plate which has a refractive index of 1.50. Calculate the speed of light in glass. The speed of light in air is $3.0 \times 10^8 \text{ ms}^{-1}$. 2
10. Distinguish between 'prompt', 'delayed' and 'spontaneous' fissions of nuclei. 2

OR

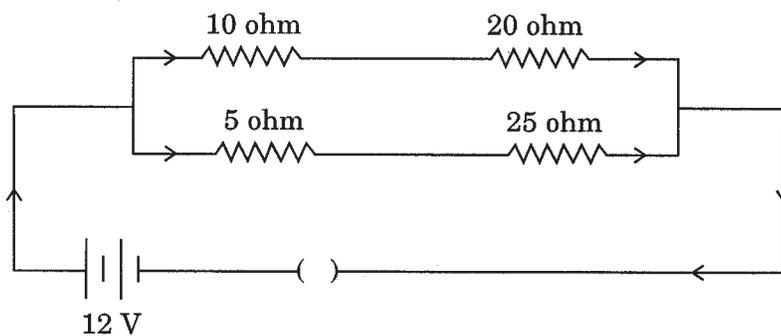
- Define a 'nuclear fusion reaction'. Describe the conditions for the occurrence of a nuclear fusion reaction.
11. When does a reversible chemical reaction reach a state of equilibrium ? Write the expression for the equilibrium constant (K) for the equilibrium reaction,
$$\text{H}_2(\text{g}) + \text{I}_2(\text{g}) \rightleftharpoons 2 \text{HI}(\text{g})$$
How will the numerical value of equilibrium constant (K) change if the equation of the equilibrium reaction is written as $2 \text{HI}(\text{g}) \rightleftharpoons \text{H}_2(\text{g}) + \text{I}_2(\text{g})$? 3
 12. Describe the 'steam reforming process' of manufacture of hydrogen from natural gas with the help of necessary chemical equations. 3

13. Give the name and formula of the monomer of natural rubber. Why is natural rubber vulcanised ? Write two uses of vulcanised rubber. 3
14. (a) Write the chemical equation representing the preparation reaction of ethanol from ethene.
- (b) Name the product obtained when ethanol is oxidised by either chromic anhydride or alkaline potassium permanganate.
- (c) Give an example of an esterification reaction. 3

OR

Differentiate between a soap and a detergent on the basis of their chemical constitutions. For cleansing action when is a detergent preferred to a soap ?

15. If a 12 V battery is connected to the arrangement of resistances given below, calculate
- (i) the total effective resistance of the arrangement and
- (ii) the total current flowing in the circuit. 3



16. What is meant by the 'calorific value' of a fuel ? How is it determined ? Arrange the following fuels in a decreasing order of their calorific values : 3
- Kerosene, Coal, LPG
17. Write three major activities of the Indian Space Research Organisation (ISRO). 3
18. Name an important oxide ore of iron. Describe the extraction of iron from this ore under the following heads : 5
- (i) Concentration of crushed ore
- (ii) Reduction of the concentrated ore
- (iii) Diagram of the furnace used
- (iv) Chemical equations for the reactions involved

OR

- (a) What is an 'activity series' of metals ? Arrange the metals Zn, Mg, Al, Cu and Fe in a decreasing order of reactivity.
- (b) What would you observe when you put
- (i) some zinc pieces into blue copper sulphate solution ?
 - (ii) some copper pieces into green ferrous sulphate solution ?
- (c) Name a metal which combines with hydrogen gas. Name the compound formed.
19. What is long-sightedness ? List two causes for development of long-sightedness. Describe with a ray diagram, how this defect may be corrected by using spectacles. 5

OR

- What is an astronomical telescope ? Draw a labelled ray diagram showing the formation of image of a distant object by an astronomical telescope. State the magnification produced by a telescope in normal adjustment. How can the magnification power of a telescope be increased ?
20. State 'Fleming's right-hand rule'. With a labelled diagram, described the working of an AC electric generator. 5

SECTION - B

21. Write the full form of IUCD. 1
22. What is the function of genes in an organism ? 1
23. Why is it necessary to conserve our environment ? 1
24. Define the term 'pollution'. Describe UASB method of checking water pollution. 2
25. How are the following caused and what is the effect of each of them on our environment ? 2
- (i) Depletion of ozone layer
 - (ii) Acid rain

OR

- What is meant by soil erosion ? Describe two practices by which soil erosion can be prevented.
26. Name the constituents of blood. Why are white blood corpuscles called 'soldiers of the body' ? 3

OR

Draw a diagram of human heart and label the following on it :

- (i) Aorta
- (ii) Pulmonary trunk
- (iii) Superior vena cava
- (iv) Coronary arteries

27. Draw a diagram of the nervous system in an insect. Label the following parts on it: 3
- (i) Brain
 - (ii) Ganglion
 - (iii) Nerve cord
28. Explain the terms, 'fission' and 'regeneration' as used in relation to reproduction. 3
29. Explain the mechanism of sex determination in the zygote. 3
30. Define the terms, 'nutrition' and 'nutrients'. List two differences between 'Holozoic nutrition' and 'Saprophytic nutrition'. Give two examples of each of these two types of nutrition. 5

Marking Scheme—Science and Technology

General Instructions

1. The Marking Scheme provides general guidelines to reduce subjectivity in the marking. The answers given in the Marking Scheme are suggested answers. The content is thus indicative. If a student has given any other answer, which is different from the one given in the Marking Scheme, but conveys the meaning such answers should be given full weightage.
2. Evaluation is to be done as per instructions provided in the Marking Scheme. It should not be done according to one's own interpretation or any other consideration – Marking Scheme should be strictly adhered to and religiously followed.
3. If a question has parts, please award marks in the right hand side for each part. Marks awarded for different parts of the question should then be totalled up and written in the left hand margin.
4. If a question does not have any parts, marks be awarded in the left-hand margin.
5. If a candidate has attempted an extra question, answer of the question deserving more marks should be retained and the other answer be scored out.
6. Wherever only two/three of a 'given' number of examples/factors/points are expected only the first two/three or expected number should be read. The rest are irrelevant and should not be examined.
7. There should be no effort at 'moderation' of the marks by the evaluating teachers. The actual total marks obtained by the candidate may be of no concern of the evaluators.
8. $\frac{1}{2}$ mark may be deducted if a candidate either does not write units or writes wrong units in a numerical.
9. A full scale of mark -0 to 100 - has to be used. Please do not hesitate to award full marks if the answer deserves it.

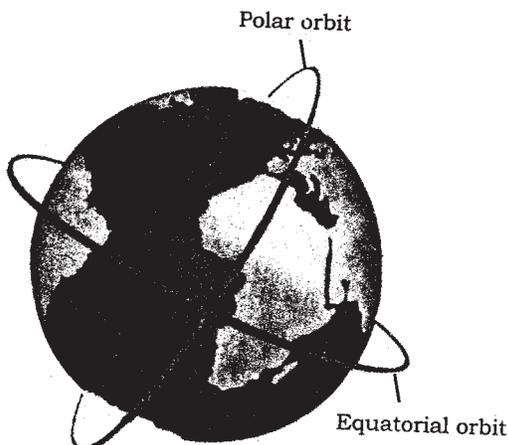
QUESTION PAPER CODE 31/1/1

EXPECTED ANSWERS/VALUE POINTS

SECTION - A

- | | | |
|----|--|---------------|
| 1. | Photosynthesis / Photography | 1 mark |
| 2. | Gold / Aluminium / Tungsten / Mercury | 1 mark |
| 3. | SO ₂ reacts with hydrogen sulphide (H ₂ S) to form sulphur /
SO ₂ + 2H ₂ S → 3S + 2H ₂ O | 1 mark |

4. Behind the mirror or a diagram showing location of image **1 mark**
5. 25W Lamp ; 2 times **1/2+1/2 mark**
Total : 1 mark
6. (i) Plaster of Paris : Calcium sulphate hemihydrate / $\text{CaSO}_4 \cdot \frac{1}{2} \text{H}_2\text{O}$ **1/2 mark**
Gypsum : Calcium sulphate dihydrate / $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ **1/2 mark**
- (ii) Gypsum on heating gives Plaster of Paris which on mixing with water gives gypsum. **1/2 mark**
- (iii) For setting fractured bones / dentistry / casts for statues / toys.(or any other) **1/2 mark**
Total : 2 marks
7. (i) Elements **1 mark**
- (ii) Any one of the following :—
Red and Yellow Phosphorus
Rhombic and monoclinic Sulphur :
Diamond and graphite Carbon **1 mark**
Total : 2 marks
8. Pg. 223 fig. 17.17 N.C.E.R.T **1, 1 marks**
Total : 2 marks



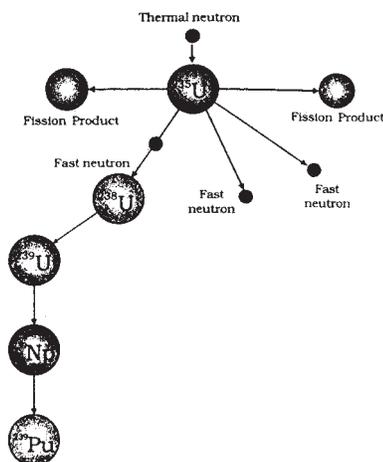
9. Refractive index of water with respect to air = 1.33
Refractive index of benzene with respect to air = 1.50
- Refractive index of benzene with respect to water = $\frac{{}^n \text{benzene} - \text{air}}{{}^n \text{water} - \text{air}}$ **1 mark**
- $= \frac{1.5}{1.33}$ **1/2 mark**
- $= 1.12$ **1/2 mark**
Total : 2 marks
10. During fission there is loss of mass which gets converted to energy. **1 mark**
Calculated as per eqⁿ $E = \Delta mc^2$ or $E = \Delta m \times 931 \text{ MeV}$ **1 mark**
Total : 2 marks

OR

(a) Low energy neutrons / slow moving neutrons / neutrons with energy 0.025 eV which cause nuclear fission. ½ mark

(b) Pg. 109 fig 8.4, N.C.E.R.T. or any other similar representation. 1½ marks

Total : 2 marks



11. (i) $\text{pH} = -\log_{10}[\text{H}^+]$ 1 mark

(ii) $[\text{H}^+]$ for pH 2 = $1 \times 10^{-2} \text{ mol L}^{-1}$ ½ mark

$[\text{H}^+]$ for pH 3 = $1 \times 10^{-3} \text{ mol L}^{-1}$ ½ mark

$[\text{H}^+]$ changes by $\frac{1 \times 10^{-2} \text{ mol L}^{-1}}{1 \times 10^{-3} \text{ mol L}^{-1}} = 10$ times 1 mark

Total : 3 marks

12. (i) Because at low temperature, the rate of formation of ammonia is very slow. Hence it is more profitable to carry out the reaction at a higher temperature, even though we may not get the maximum yield. 2 marks

(ii) Acts as a catalyst / to speed up the reaction 1 mark

Total : 3 marks

13. (i) Addition Polymers : They are formed by addition reactions of unsaturated monomers.

Condensation Polymers : They are formed through condensation reaction of the monomers with the elimination of small molecules such as water. 1 mark

- (ii) Addition Polymer : Teflon / Neoprene ½ mark
 Condensation Polymer : Polyester / Nylon ½ mark
- (iii) Hexamethylene diamine + Adipic acid → Polyamide + water 1 mark

Total : 3 marks

Or

Equation in Symbolic form

14. (a) $2C_2H_5OH + O_2 \rightarrow 2CH_3CHO + 2H_2O$ 1 mark

(conditions and balancing not to be emphasised)

- (b) (i) A shining silver mirror is formed ½ mark
 (ii) A red precipitate is formed. ½ mark

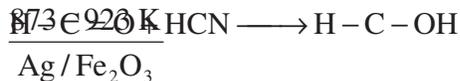


- (c) 1 mark
- $$\begin{array}{c} | \\ CN \end{array}$$

Total : 3 marks

OR

- (i) CH_3COOH , Carboxyl
 (ii) CH_3COCH_3 , Ketonic
 (iii) CH_3NO_2 , Nitro



½×6 mark

Total : 3 marks

15. $V = 2.5 V$ $I = 750mA = 0.75 A$ $t = 2 \text{ hrs.}$

- (i) $P = VI$ ½ mark
 $= 2.5V \times 0.75 A$
 $= 1.875 W$ ½ mark

- (ii) $R = \frac{V}{I}$ ½ mark
 $= \frac{2.5 V}{0.75 A}$
 $= 3.33 \Omega \text{ (ohm)}$ ½ mark

- (iii) $E = P \times t$ ½ mark
 $= 1.875 W \times 4 h$
 $= 7.5 Wh$ ½ mark

Total : 3 marks

16. (a) Forms of energy -
 (i) Tidal energy
 (ii) Sea Wave energy
 (iii) Ocean thermal energy ½× 3 marks
- (b) The devices used to harness ocean thermal energy are called OTEC power plants ½ mark
- (c) Operation
 Warm surface water is used to boil a liquid (like ammonia or a CFC) 1 mark
 The Vapour of the liquid drives the turbine of generator

Total : 3 marks

17. Big Bang Theory

- (i) It is imagined that in the past (15×10^9 yrs ago) the Universe was concentrated lump of matter / was together at one place and occupied a small volume 1 mark
- (ii) Some event in the form of huge explosion took place. 1 mark
- (iii) This caused the movement of fragments (galaxies) away from each other. 1 mark

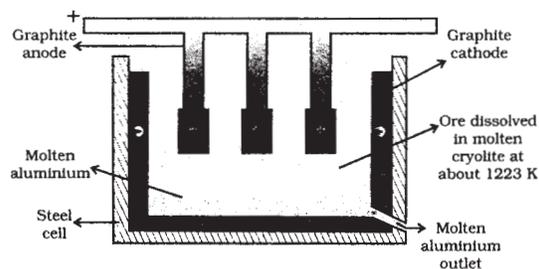
Total : 3 marks

18. (a) $\text{Al}_2\text{O}_3 + 2\text{NaOH} \rightarrow 2\text{NaAlO}_2 + \text{H}_2\text{O}$
 $\text{NaAlO}_2 + 2\text{H}_2\text{O} \rightarrow \text{Al}(\text{OH})_3 + \text{NaOH}$
 $2\text{Al}(\text{OH})_3 \xrightarrow{\text{heat}} \text{Al}_2\text{O}_3 + 3\text{H}_2\text{O} \rightarrow$
 (any two equations correct)

2×1 marks

Total : 2 marks

- (b) Fig. 14.5, Page 174, NCERT, Electrolytic Reduction of Alumina



Diagram

1 mark

Labelling :

- (i) Ore dissolved in molten cryolite
 (ii) Molten Aluminium
 (iii) Graphite anode
 (iv) Graphite cathode
 (v) Steel Cell
 (vi) Molten Aluminium outlet (any 4)

½×4 marks

Total : 5 marks

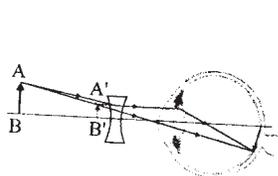
OR

- (a) When the surface of a metal is attacked by air, water or any other substance around it, it is said to corrode and the phenomenon is known as corrosion. 1
Metal which does not corrode : Gold / Silver or any other. 1/2
Metal which corrodes : Iron / Copper / Aluminium or any other. 1/2
- (b) Activity to show that rusting of iron needs oxygen and moisture at the same time:
In test tube A, both air and water are present, the iron nails become rusty.
In test tube B, there is no air in the water and iron nails do not rust.
In test tube C, the air is dry and the iron nails do not rust. Fig 14.7 Page 177 3

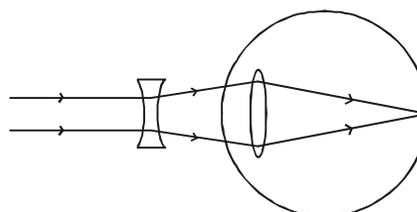
Total : 5 marks

19. (a) (i) Myopia - Defect in vision in which a person can see nearby objects clearly but can't see distant objects clearly 1/2
It can be corrected by a concave lens (of appropriate focal length) 1/2
- (ii) Astigmatism - Defect, when a person can't simultaneously focus on both horizontal and vertical lines 1/2
It can be corrected by using glasses with cylindrical lenses. 1/2
- (iii) Bifocal lenses - Combination of two lenses / diagram. for the same, for correcting the defect of presbyopia (when a person suffers from both myopia and hypermetropia) 1/2
1/2
- (iv) Farsightedness defect, when a person can't see nearby objects clearly but distant objects can be clearly seen. 1/2
corrected by using convex (converging) lens of appropriate focal length. 1/2

(b)



or

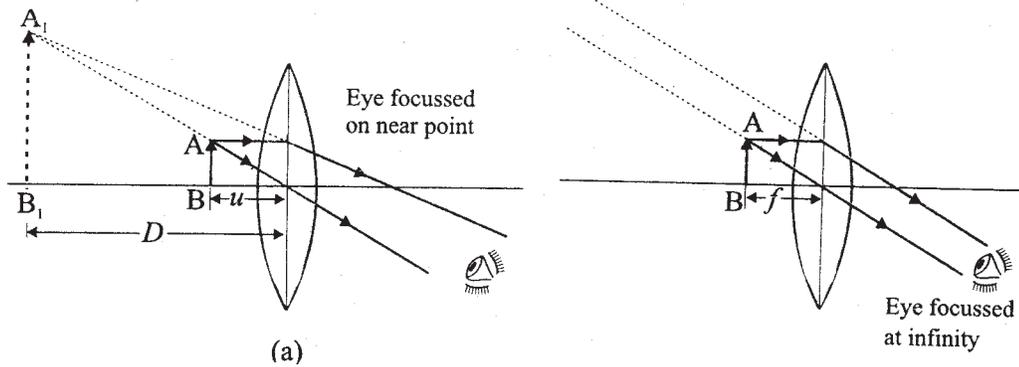


1 mark

Total : 5 marks

OR

- (a) Simple microscope - a converging lens of short focal length for getting a magnified image. 1 mark



- (b) Maximum magnification is about 10 or $\frac{D}{f}$ or $1 + \frac{D}{f}$ 1 mark

Total : 5 marks

20. (a) A magnetic field line is a path along which a free north pole tends to move 1 mark
 Direction - is determined by a magnetic compass. The direction in which the north pole of the compass points gives the direction of magnetic field line. ½ mark
- (b) Any two lines one above and one below :-

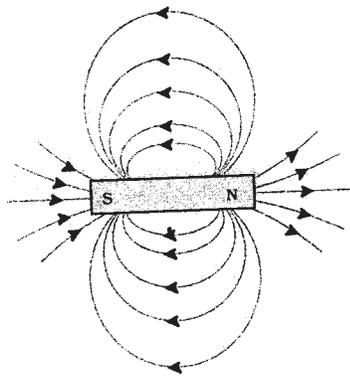


Diagram 1 mark

Direction 1 mark

- (c) Properties of magnetic field lines. ½×3 marks
- (i) direction of field lines is from North to South pole.
 - (ii) No two field lines intersect
 - (iii) Degree of closeness of the field lines indicates the strength of the magnetic field.

Total : 5 marks

(SECTION - B)

21. Acquired Immuno Deficiency Syndrome. 1 mark
22. The centromere is situated closer to one end 1 mark
23. The rise of temperature due to trapping of heat radiations by CO₂ / methane. 1 mark
24. Excessive loading of water reservoirs with nutrients and algal growth causing reduction in O₂ level of water is called eutrophication. 1 mark

Harmful effects

- (i) Reduction of dissolved oxygen in water.
- (ii) It kills aquatic organisms. 1/2+1/2 marks

Total : 2 marks

25. Practices which help in protecting environment.

- (i) Rotation of crop.
- (ii) Judicious use of fertilizers, intensive cropping, proper drainage and irrigation.
- (iii) Treatment of sewage so that it does not pollute the rivers and other water bodies.
- (iv) Composting organic solid waste for use as manure.
- (v) Aforestation.
- (vi) Establishment of National parks and conservation of forests.
- (vii) Harvesting of rain water (any four) 1/2×4 marks

Total : 2 marks

OR

Modes of disposal of waste

- (i) Most solid waste are buried in urban areas as land fills.
- (ii) Plastic, Metals & paper can be recycled.
- (iii) Waste can be used to make manure.
- (iv) Molten plastic waste mixed with asphalt can be used for making roads.
- (v) Can be burnt at high temperature (incineration).
- (vi) Effluent from distilleries and waste containing organic matter can be sent to biogas plant. (any four) 1/2×4 marks

Total : 2 marks

26. (i) Transport of food from leaves to other parts of the plant is called Translocation. 1 mark
- (ii) Translocation is necessary
- (a) Every part of the plant needs food for harnessing energy. 1/2 mark
- (b) For building and maintaining the organism. 1/2 mark
- (iii) Sugar is synthesised in leaf. 1/2 mark
- Hormones are synthesised at the tip of root & shoot. 1/2 mark

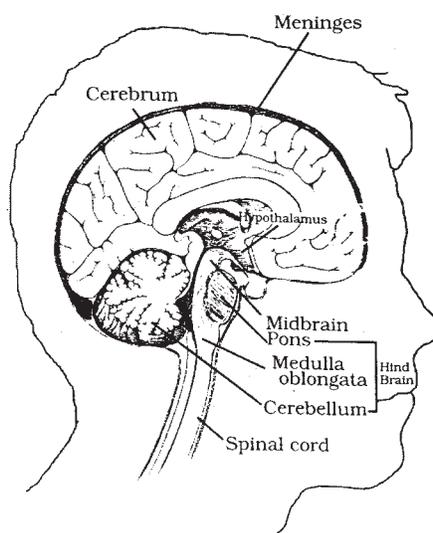
Total : 3 marks

OR

- (a) The mechanism by which body prevents loss of blood by forming clot is called blood clotting. 1 mark
- (b) (i) Injured tissue + blood platelets \longrightarrow release thromboplastin
- (ii) Prothrombin $\xrightarrow{\text{Thromboplastin}}$ Thrombin
- (iii) Fibrinogen $\xrightarrow{\text{Thrombin}}$ Fibrin
- (iv) Fibrin + Red blood corpuscles \longrightarrow blood clot. 2 marks

Total : 3 marks

27. Page No. 145, Fig. 11.4 NCERT



Digram 1 mark

Labelling $\frac{1}{2} \times 4$ marks

Total : 3 marks

28. **Self Pollination**

The transfer of pollen from the anther of a flower to the stigma of the same flower or another flower of the same plant

Cross Pollination

The transfer of pollen grains from the anther of one flower to the stigma of another flower of a different plant of the same species. 1 mark

Double Fertilization.

1. Pollen tube releases two male gametes.
2. Out of two, one male gamete fuses with egg to form zygote. This is called syngamy.
3. The other male gamete fuses with two polar nuclei. This is called triple fusion.
4. Inside embryo sac two fusions, syngamy and triple fusion takes place. This is called double fertilization. 2 marks

Total : 3 marks

29. (i) Organic evolution is the study about evolution of the living organisms or any other definition. 1 mark
- (ii) Embryological studies of early embryos of different vertebrates show striking similarities. This indicates common origin and ancestry of the different Vertebrates / Haeckel suggested biogenetic law which states that, ontogeny recapitulates
Phylogeny / During the embryonic development of any organism its complete evolutionary history is repeated. 2 marks

Total : 3 marks

30. Photosynthesis is a process in which plants use sunlight, chlorophyll, CO₂ and water to synthesise food

or

Photosynthesis occurs in two stages :—

1. Light reaction : During light reaction ATP & NADPH are generated. This step is light dependent.
2. Dark reaction : not dependent on light. During dark reaction CO₂ is reduced to carbohydrate. Source of energy is ATP & NADPH. 1 mark

Factors affecting photosynthesis :—

1. Light - Rate of photosynthesis increases at the lower intensities and decreases at its higher intensities. ½, ½ mark
2. Temperature :- Low & high temperature has inhibitory effect on the rate of Photosynthesis. ½, ½ mark
3. Water : The rate of photosynthesis will become slow under water deficient conditions. ½, ½ mark
4. Carbon dioxide : The rate of photosynthesis increases with an increase in CO₂ concentration upto a certain level Beyond that it may prove inhibitory. ½, ½ mark

Total : 5 marks

QUESTION PAPER CODE 31/1

EXPECTED ANSWERS/VALUE POINTS

SECTION - A

1. Enzymes / First increases, then decreases 1 mark
2. Gold and Silver or any other suitable metal ½+½ = 1 mark
3. $\text{CuO} + \text{H}_2 \longrightarrow \text{Cu} + \text{H}_2\text{O}$ 1 mark