

SCIENCE & TECHNOLOGY

SAMPLE PAPER-I

Marking Scheme/Hints to Solutions

Note : Any other relevant answer, not given here in but given by the candidates, be suitably awarded.

Q.No.	Value points / key points	Marks allotted to each key point/Value point	Total Marks
Section-A			
1.	(a) Malaria and Dengue	1	1
2.	(d) Beaker A and Beaker D	1	1
3.	(d) Rise of mercury in glass tube of thermometer	1	1
4.	(d) gravel	1	1
5.	(c) Glass has low ignition temperature	1	1
6.	(b) Optical density of C is more than B	1	1
7.	(a) is refracted towards the normal	1	1
8.	(c) Concave in the upper part and convex in the lower part	1	1
9.	(d) D	1	1
10.	(b) Unlike natural fibers they absorb sweat	1	1
11.	(b) Rayon	1	1
12.	(c) External fertilisation and external development	1	1

13.	(c) (ii), (i), (iv), (iii)	1	1									
14.	(a) XX	1	1									
15.	(a) Due to increased activity of sweat and sebaceous glands.	1	1									
16.	(c) P-Vinegar; Q-Vegetable oil	1	1									
17.	(d) A is false but R is true	1	1									
18.	(c) A is true but R is false	1	1									
19.	(a) Both A and R are true and R is the correct explanation of Assertion.	1	1									
20.	(d) A is false but R is true	1	1									
Section-B												
21.	(a) A- non metal	½	2									
	(b) alloy of non-metal is steel	½										
	• steel-iron + carbon	1										
OR												
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33%;">Property</th> <th style="width: 33%;">Metal</th> <th style="width: 33%;">Non-metal</th> </tr> </thead> <tbody> <tr> <td>Sonorosity</td> <td>Metals are sonorous.</td> <td>Non-metals are non sonorous.</td> </tr> <tr> <td>Melting point</td> <td>Metals have generally high melting point.</td> <td>Non-metals generally have low melting point.</td> </tr> </tbody> </table>		Property	Metal	Non-metal	Sonorosity	Metals are sonorous.	Non-metals are non sonorous.	Melting point	Metals have generally high melting point.	Non-metals generally have low melting point.	1+1	
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22.	(a) to cut off the supply of air so that fire gets extinguished. (b) because a burning material can ignite the petrol vapours / can result in major fire due to ignition of petrol vapours.	1 1	2
23.	(a) It is because the sound travels faster through solids than gases. (b) The speed of sound is much less than the speed of light in air / The speed of light is millions times more than the speed of sound in air.	1 1	2
24.	(a) Thread B (b) They dry quickly. They are easy to clean. They do not shrink on washing. They are less expensive than natural fibres. (any one)	1 1	2
25.	In humans the young one, at birth, is miniature version of the adult form. In metamorphosis process, the body parts of the adult are different from those at the time of birth hence term metamorphosis is not used while describing human development.	1 1	2
26.	The disease is diabetes. Cause : Insulin a hormone released by pancreas, lowers the blood glucose level. If it is not secreted in sufficient quantities, the person is said to suffer from the disease called diabetes.	1 1	2

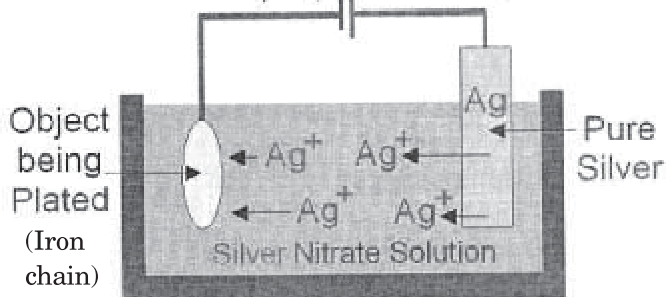
Section-C			
27.	(a) Sulphurous acid is formed	1	3
	(b) Put blue litmus paper in the formed product and the change in colour from blue to red indicates that the formed produce is acidic in nature / by testing the solution (formed product) with blue litmus.	1	
	(c) $\text{SO}_2 + \text{H}_2\text{O} \rightarrow \text{H}_2\text{SO}_3$	1	
28.	(a) purity (b) 24 parts		
	(c) noble metals (d) chemically	$\frac{1}{2} \times 6$	
	(e) soft (f) silver/copper		3
29.	(a) Friend : <ul style="list-style-type: none">• Grip : Friction between the player's hand and the racket handle is essential for a good grip.• Footwork : Friction between the player's shoes and the court surface provides grip with ground.• Shuttle Control : Friction between the shuttlecock and the strings of the racket.	1+1+1	3
	(b) Troublemaker : <ul style="list-style-type: none">• Air Resistance : When the shuttlecock moves through the air, air resistance creates drag, slowing down the shuttlecock. This can affect the speed of shots.• Floor friction : Excessive friction between the player's shoes and the court surface can lead to injuries. <p>(any three points)</p>		

30.	(i) Persistence of vision. The ability of the human eye to continue to see the images of an object for a very short duration (1/16th of a sec.) even after the removal of object. (ii) Cinematography, motion picture projection.		2 1	3							
31.	<table border="1"> <tr> <td data-bbox="173 391 547 518">(a) Binary fission in Amoeba</td> <td data-bbox="547 391 946 518">(b) Multiple fission in plasmodium</td> </tr> <tr> <td data-bbox="173 518 547 746">In this process, a parent cell divides into two daughter cells.</td> <td data-bbox="547 518 946 746">It is the repeated division of a parent cell into a number of small individuals.</td> </tr> </table>	(a) Binary fission in Amoeba	(b) Multiple fission in plasmodium	In this process, a parent cell divides into two daughter cells.	It is the repeated division of a parent cell into a number of small individuals.	<table border="1"> <tr> <td data-bbox="547 391 946 518">(b) Multiple fission in plasmodium</td> <td data-bbox="946 391 1114 518">$\frac{1}{2} + \frac{1}{2}$</td> </tr> <tr> <td data-bbox="547 518 946 746">It is the repeated division of a parent cell into a number of small individuals.</td> <td data-bbox="946 518 1114 746">1+1</td> </tr> </table>	(b) Multiple fission in plasmodium	$\frac{1}{2} + \frac{1}{2}$	It is the repeated division of a parent cell into a number of small individuals.	1+1	3
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Alternative answer for visually challenged students in lieu of Q. 31											
Binary fission : In this process, a parent cell divides into two daughter cells and each cell, thus formed, grows to form an individual.											
Example : Amoeba											
Budding : The formation of a new individual, from a small protuberance called bud arising on the parent body is called budding.											
Example : yeast											
OR											
(i) legs and lungs develop											
(ii) intestine shorten											
(iii) tail is absorbed by the body											

32.	<p>(a) (i) Phase Q – childhood, Phase R – adolescence</p> <p>(ii) 11 years</p> <p>(b) Heredity environmental factors such as diet and exercise. (any one)</p> <p>Alternative answer for visually challenged students in lieu of Q. 32</p> <p>(a) Human beings have 46 chromosomes in the nuclei of their cells. Of these, 44 are known as autosomes and the last pair is termed as sex chromosomes.</p> <p>(b) (i) The gametes (ovum and sperm) have half the number of chromosomes as that of cell occurring elsewhere in the body. The egg will always have 22+ X chromosomes while a sperm will have either 22+X or 22+Y chromosomes.</p> <p>(ii) During fertilisation if an egg fuses with a 22+Y sperm the resulting zygote will develop into male child.</p> <p>If an egg fuses with a 22+X sperm, the resulting zygote will develop into a female child.</p>	1 1 1 1 2	3
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33. (i) Electroplating. Advantage to minimise the cost. 1 3

(ii) Cathode (-ve) Anode (+ve)



2

Alternative answer for visually challenged students in lieu of Q. 33

Cathode – Iron

$\frac{1}{2}$

Anode – Silver

$\frac{1}{2}$

Electrolyte – Silver Nitrate

1

Section-D

34. (a) Renewable resources and non-renewable resources on the basis of availability. 1+1

Natural sources and synthetic sources on the basis of its occurrence.

(b) Renewable : Energy resource that can replenish itself naturally over a short period of time.

Non-renewable : Energy resource which get used up and cannot be replenished in a short period of time.

1+1

(c) Renewable resources – Wind, Sun and hydropower.

1

Non-renewable – Coal, Petroleum and natural gas. (any one example from each)

5

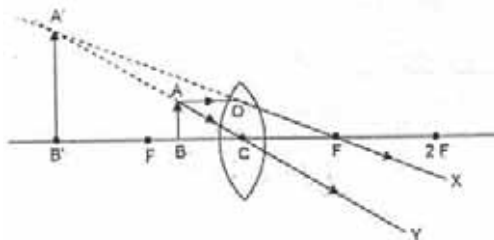
OR

- | | | |
|--|--|---------|
| | (a) (i) Peat – 30% of carbon | 1/2+1/2 |
| | (ii) Lignite – 38% of carbon | 1/2+1/2 |
| | (iii) Bituminous – 65% of carbon | 1/2+1/2 |
| | (iv) Anthracite – 90% of carbon | 1/2+1/2 |
| | (b) <i>petra</i> – meaning ‘rock’ and
<i>oleum</i> – meaning ‘oil’. | 1/2+1/2 |

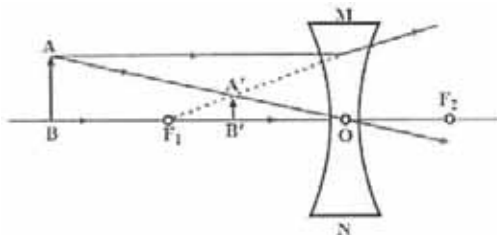
- | | | |
|-----|---|---|
| 35. | (a) Dispersion of light | 1 |
| | (b) We can see a rainbow if the sun comes out or shines immediately after the rainfall. | 1 |
| | (c) The drops of water suspended in the air after the rainfall, disperse the sunlight in much the same way as a glass prism in Newton’s experiment. | 2 |
| | (d) Spectrum / VIBGYOR | 1 |

OR

- | | | |
|-----|---|-------|
| (a) | Student X – Convex lens
Student Y – Concave lens | 1 |
| (b) | Image will be virtual in both the cases. | 1 |
| (c) | Student X | 1 1/2 |



- | | | |
|-----------|--|-------|
| Student Y | | 1 1/2 |
|-----------|--|-------|



(1 mark for diagram and labelling and 1/2 mark for arrows)

36.

(a)

Cells of onion peel	Cells of cheek
(i) Cells are arranged in rows	(i) Cells in clusters
(ii) Nucleus is peripheral in position.	(ii) Nucleus is in centre.
(iii) Cell wall is present.	(iii) Cell wall is absent.

1

1

1

(any other relevant)

(b)

Levels	Cell	(i) Tissue _____	An organ	(ii) Organ system _____	An organism
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1/2+1/2

5

Relation between all the levels is – cells combine to form tissue, Tissues combine to form an organ, organs combine to form an organ system, organ systems combine to form an organism.

1

OR

(a) (i) nuclear membrane

(ii) nucleoplasm

1/2+1/2

(iii) cytoplasm

1/2

(iv) chromatin

1/2

(b)

Amoeba	Earthworm
It is unicellular Invisible to naked eye due to its very small size	It is multicellular can be seen with naked eye

1

1

	(c) Nerve cell has to transmit nerve impulses to organs located in different parts of the body, hence it possess a long fibre like structure.	1	
37.	(a) From Hole A. Because liquid pressure increases with an increase in the depth of the hole. Or liquid pressure increases with the height of water column above it.	1×4	4
	(b) Liquid pressure, at any point inside the liquid, depends upon the height of liquid column above that point. Liquid pressure also depends on the density of the liquid.		
	(c) No. Since oil has lower density than water, it will exert less pressure. Consequently, oil will flow out of hole A closer to the cylinder compared to water.		
	(d) If both holes are made at the same horizontal level, the liquid pressure at each hole would be the same, the water will go the same distance horizontally from the container from both holes.		
	(e) As now the height of the liquid column will decrease so liquid pressure will also decrease at the bottom of cylinder. (any four)		
38.	(a) $X > Z > Y$	1×4	4
	(b) Because fuel X has highest calorific value so it has greatest efficiency.		

- (c) Fuel Y, because a fuel with low calorific value burns inefficiently.
- (d) Fuel Y can result in-
Release of carbon particles.
Green house effect.
Global warming
(any other relevant answer)
- (e) 3 kg
(any four)

Answer to alternative question for visually impaired students in lieu of Q. No. 38

- (a) Fuel C
- (b) $C < A < B$
- (c) Total heat produced
= calorific value*amount of fuel
- (d) Characteristics of gaseous fuels :
- Gaseous fuels have a high calorific value.
 - These fuels leave no ash and produce no smoke.
 - These fuels have low ignition temperatures.
 - These fuels can be easily transported and stored easily. (any one)
- (e) Solid fuel – Coal, wood (any one)
Liquid fuel – kerosene, petrol (any one)

1×4

39.	(a) Food poisoning	1	
	(b) Dehydration, vomiting (any other relevant symptom)	1	
	(c) water and ORS will keep Kiran hydrated. (any other relevant point)	1	
	(d) food preservation is important in our daily life to stop or slow down, spoilage of food by microorganisms.	1	
	(e) Pasteurisation (attempt any four)	1	4