

CLASS : 10th (Secondary) 1955/1905

Series : Sec. M/2017

SET : A, B, C & D

Total No. of Printed Pages : **40**

MARKING INSTRUCTIONS AND MODEL ANSWERS

SCIENCE

(Academic/Open)

(Only for Fresh Candidates)

उप-परीक्षक मूल्यांकन निर्देशों का ध्यानपूर्वक अवलोकन करके उत्तर-पुस्तिकाओं का मूल्यांकन करें। यदि परीक्षार्थी ने प्रश्न पूर्ण व सही हल किया है तो उसके पूर्ण अंक दें।

General Instructions :

- (i) *Examiners are advised to go through the general as well as specific instructions before taking up evaluation of the answer-books.*
- (ii) *Instructions given in the marking scheme are to be followed strictly so that there may be uniformity in evaluation.*
- (iii) *Mistakes in the answers are to be underlined or encircled.*
- (iv) *Examiners need not hesitate in awarding full marks to the examinee if the answer/s is/are absolutely correct.*

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- (v) *Examiners are requested to ensure that every answer is seriously and honestly gone through before it is awarded mark/s. It will ensure the authenticity as their evaluation and enhance the reputation of the Institution.*
- (vi) *A question having parts is to be evaluated and awarded partwise.*
- (vii) *If an examinee writes an acceptable answer which is not given in the marking scheme, he or she may be awarded marks only after consultation with the head-examiner.*
- (viii) *If an examinee attempts an extra question, that answer deserving higher award should be retained and the other scored out.*
- (ix) *Word limit wherever prescribed, if violated upto 10%. On both sides, may be ignored. If the violation exceeds 10%, 1 mark may be deducted.*
- (x) *Head-examiners will approve the standard of marking of the examiners under them only after ensuring the non-violation of the instructions given in the marking scheme.*

(xi) *Head-examiners and examiners are once again requested and advised to ensure the authenticity of their evaluation by going through the answers seriously, sincerely and honestly. The advice, if not heeded to, will bring a bad name to them and the Institution.*

महत्त्वपूर्ण निर्देश :

- (i) अंक-योजना का उद्देश्य मूल्यांकन को अधिकाधिक वस्तुनिष्ठ बनाना है। अंक-योजना में दिए गए उत्तर-बिन्दु अंतिम नहीं हैं। ये सुझावात्मक एवं सांकेतिक हैं। यदि परीक्षार्थी ने इनसे भिन्न, किन्तु उपयुक्त उत्तर दिए हैं तो उसे उपयुक्त अंक दिए जाएँ।
- (ii) शुद्ध, सार्थक एवं सटीक उत्तरों को यथायोग्य अधिमान दिए जाएँ।
- (iii) परीक्षार्थी द्वारा अपेक्षा के अनुरूप सही उत्तर लिखने पर उसे पूर्ण अंक दिए जाएँ।
- (iv) वर्तनीगत अशुद्धियों एवं विषयांतर की स्थिति में अधिक अंक देकर प्रोत्साहित न करें।
- (v) भाषा-क्षमता एवं अभिव्यक्ति-कौशल पर ध्यान दिया जाए।

(vi) मुख्य-परीक्षकों/उप-परीक्षकों को उत्तर पुस्तिकाओं का मूल्यांकन करने के लिए केवल Marking Instructions/Guidelines दी जा रही है, यदि मूल्यांकन निर्देश में किसी प्रकार की त्रुटि हो, प्रश्न का उत्तर स्पष्ट न हो, मूल्यांकन निर्देश में दिए गए उत्तर से अलग कोई और भी उत्तर सही हो तो परीक्षक, मुख्य-परीक्षक से विचार-विमर्श करके उस प्रश्न का मूल्यांकन अपने विवेक अनुसार करें।

SET – A

SECTION – A

[Marks : 20

(Physics)

- | | |
|---|---|
| 1. (b) Real and inverted | 1 |
| 2. (c) Scattering | 1 |
| 3. (b) $\frac{I^2}{R}$ | 1 |
| 4. (b) Solar energy | 1 |
| 5. The sources which would have more efficiency, easily accessible, easy to store and transport and economical are the good source of energy. | 2 |

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6. Pot. diff. $V = 80 \text{ V}$

Current $I = 5\text{A}$

$$\therefore R = \frac{V}{I} = \frac{80}{5} = 16 \Omega$$

When pot. diff. is increased to 160 V , then
current is given by current $\frac{V}{R} = \frac{160}{16} = 10\text{A}$ 2

7. Construction of large dams cause :

- (i) Economic problems because they swallow up huge amounts of public money without generation of proportionate benefits.
- (ii) Environmental problems because they contribute enormously to deforestation and the loss of biological diversity. 2

8. Ray diagram = 1 mark

Explanation of position,
nature and relative image

1 + 1 + 1 + 1

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(Explain the path of rays through focus, centre of curvature & pole.)

9. Diagram	1
Principle	1
Working	3
Function of split ring	1

OR

(a) Right hand thumb rule	2
(b) Diagram	1
Explanation	3

SECTION – B

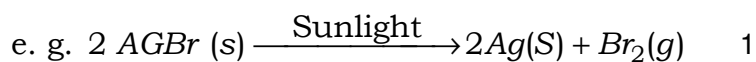
Marks : 19

(Chemistry)

10. (a)	1
11. (d)	1
12. (b)	1

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13. The reactions in which energy is absorbed are called endothermic reactions. 1



14. On heating gypsum at 373 k, it loses water molecules and becomes calcium sulphate hemihydrates also called POP. 1

Reaction :



15. Dohereiner arranged the elements in a group of three called 'Triads' and showed that when the three elements in a triad were written in order of increasing atomic masses the mass of middle element was roughly average of atomic masses of other two elements. $1\frac{1}{2}$

e. g,

Cl 35.5

Br 79.9

I 126.9

$\frac{1}{2}$

16. (a) The reactivity series is a list of metals arranged in order of their decreasing reactivities. 1

e. g. $K, Na, Ca \rightarrow Zn, Fe, Ph \rightarrow Cu, Hg, Ag$

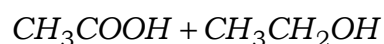
Most reactive – Medium reactive → Least relative 1

- (b) Bronze – Copper + tin (Cu of Sn) 1

Brass – Copper + zinc (Cu of Zn) 1

17. (i) **Esterification Reaction** : Esters are most commonly formed by reaction of an acid of an alcohol. 1

Ethanoic acid reacts with ethanol in the presence of acid catalyst to give an ester.

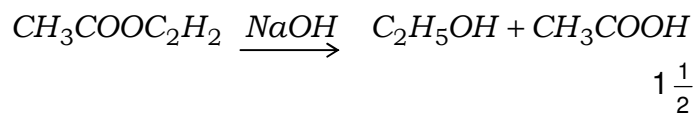


- (ii) **Saponification** : Esters react in the presence of an acid or a base to give back the alcohol and carboxylic acid. This reaction is

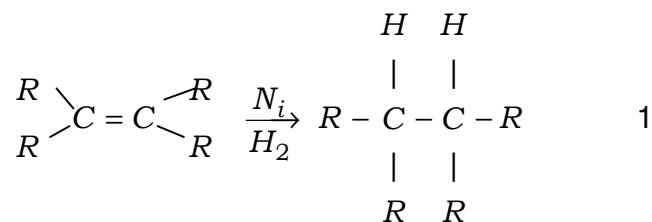
(9)

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known as saponification Reaction because it is used in the preparation of a soap. 1



(iii) **Hydrogenation** : Unsaturated hydrocarbons add hydrogen in the presence of catalysts such as palladium or Nickel to give saturated hydrocarbons. 1



OR

Naming a carbon compound can be done by the following method :

- (i) Identify the number of carbon atoms in the compound. A compound having three carbon atoms would have the name propane.

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- (ii) In case a functional group is present, it is indicated in the name of the compound with either a prefix or a suffix.
- (iii) If the name of the functional group is to be given as a suffix, the name of the carbon chain is modified by deleting the final 'e' and adding the appropriate suffix. e.g. a three carbon chain with a aldehyde group would be named in the following manner-Propane - 'e' = Propan + al = Propanal.
- (iv) If the carbon chain is unsaturated, then the final 'ane' in the name of the carbon chain is substituted by 'ene' or 'yne'. e.g. a four carbon chain with a triple bond would be called butyne and if it has a double bond it would be called butene.

$$1\frac{1}{2} \times 4 = 6$$

SECTION – C

[Marks : 21

(Life Science)

18. (d)

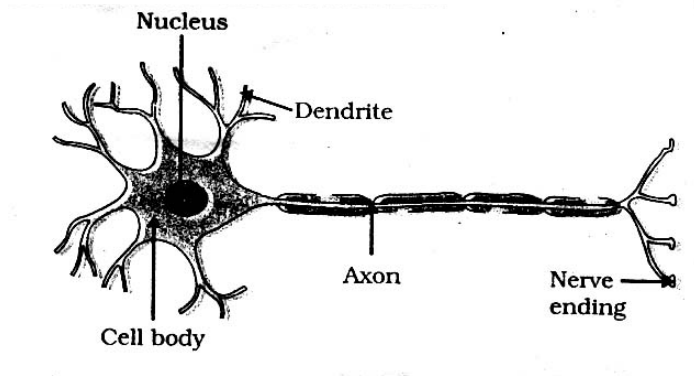
1

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- 19.** (c) 1
- 20.** Leishmania 1
- 21.** (b) Second 1
- 22.** All interacting organisms in an area together with non living constituents of the environment. 1
- 23.** (i) Gonorrhoea
- (ii) Syphilis
- (iii) Warts
- (iv) HIV-AIDS $\frac{1}{2} \times 4 = 2$
- 24.** Directional of tropic movements towards or away the stimulus of gravity. Upward and downward growth of shoots and roots, respectively, in response to the pull of earth or gravity. Plants roots shows downward movement while shoots grow away from earth. 2

23.

2



26. Cellular DNA is the information source of making proteins in the cell i. e, the gene for that protein. If the enzyme of a hormone works efficiently a lot of hormone will be made but if the gene for that enzyme has an alteration that makes the enzyme less efficient, the amount of hormone will be less & the plant will be short. Thus genes control characteristics. Each cell will have two copies of each chromosome one from male & one from female. When two germ cells combine, restore the normal no. of chromosome in the progeny ensuring stability of DNA of the species.

4

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27. See page No. **112** Science Text book for class **X**.

6

OR

See page No. **98** Text book for class **X**.

6

SET – B

SECTION – A
(Physics)

[Marks : 20

- | | |
|---|---|
| 1. (a) Refraction. | 1 |
| 2. (d) Pupil | 1 |
| 3. (b) 100 W | 1 |
| 4. (c) Nuclear energy | 1 |
| 5. (i) Wind energy farms can be established only at places which have wind blowing for greater part of the year. | |

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P. T. O.

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(ii) Wind speed should be greater than 15 km/h to maintain the required speed of turbine. 2

6. Resistivity of an alloy is generally higher than that of its constituent metals. Alloys do not oxidise easily at height temperatures. 2

7. Any **two** of following :

(i) Khadins and nadis in Rajasthan.

(ii) Bandharas and tals in Maharashtra.

(iii) Bundhis in Madhya Pradesh.

(iv) Ahars and Pynes in Bihar.

(v) Kulhs in Himachal Pradesh.

(vi) Surangams in Kerala etc. 2

8. Same as Ans : of Question **8** in **Set A**. only the position of object is changed. 1 + 1 + 1 + 1

9. Principle 1

Working 3

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Diagram	1
Function of Brushes	1

OR

(a) Fleming's LH rule	2
(b) Diagram	1
Explanation	3

SECTION – B

[Marks : 19

(Chemistry)

- | | |
|---|---|
| 10. (i) (b) | 1 |
| 11. (ii) (d) | 1 |
| 12. (iii) (c) | 1 |
| 13. The reactions in which a single product is formed from two or more reactants are known as combination reactions. | 1 |
| e. g. $\text{CaO(s)} + \text{H}_2\text{O(l)} \rightarrow \text{Ca (OH)}_2\text{(aq)}$ | 1 |

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P. T. O.

14. Common name of $CaOCl_2$ is bleaching powder 1



15. (i) This law is applicable only upto calcium. 1

- (ii) It was assumed by Newlands that only 56 elements existed in nature. 1

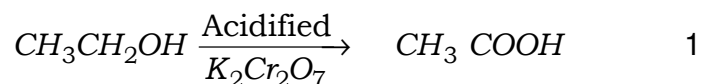
16. (a) The oxides which react with acid as well as bases to produce salt and water are known as amphoteric oxides e.g. Al_2O_3 and ZnO . 2

- (b) The impure metal is made the anode and a thin strip of pure metal is made the cathode. 1

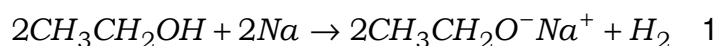
A solution of metal salt is used as an electrolyte. On passing the current through the electrolyte, the pure metal from anode dissolves into the electrolyte. An equivalent amount of pure metal from the electrolyte is deposited on the cathods.

Procedure 1

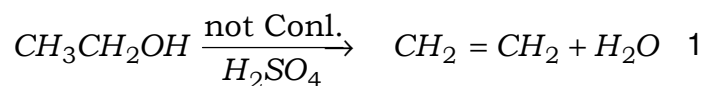
17. (i) **Reaction with acidified pot. dichromate :**
 Acidified pot dichromate oxidises ethanol to acetic acid. 1



- (ii) **Reaction with sodium :** Ethanol react with sodium to form sodium ethoxide with evolution of hydrogen gas. 1



- (iii) Heating ethanol at 443K with excess hot cone. sulphuric acid results in the dehydration of ethanol to give ethane. 1



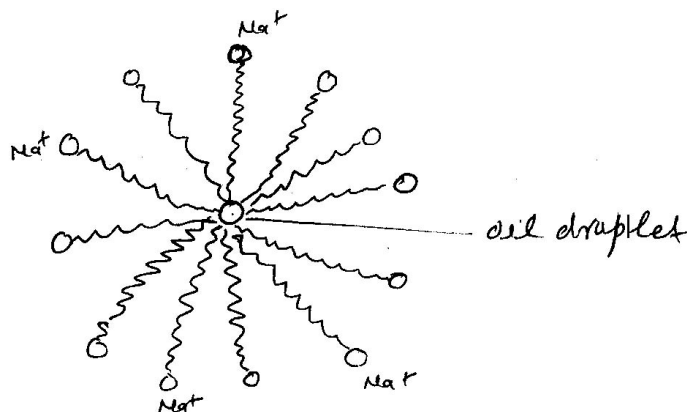
OR

The molecules of soap are sodium or potassium salts of long chain carboxylic acids. The ionic end of soap dissolves in water while the carbon chain dissolves in oil. The soap molecules thus form structures called micelles where one end of

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the molecule is towards the oil droplet while the ionic end faces outside. This forms an emulsion in water. The soap micelle thus helps in dissolving the dirt in water and we can wash our clothes clean.



Formation of micelles

6

SECTION – C

[Marks : 21

(Life Science)

18. (b)

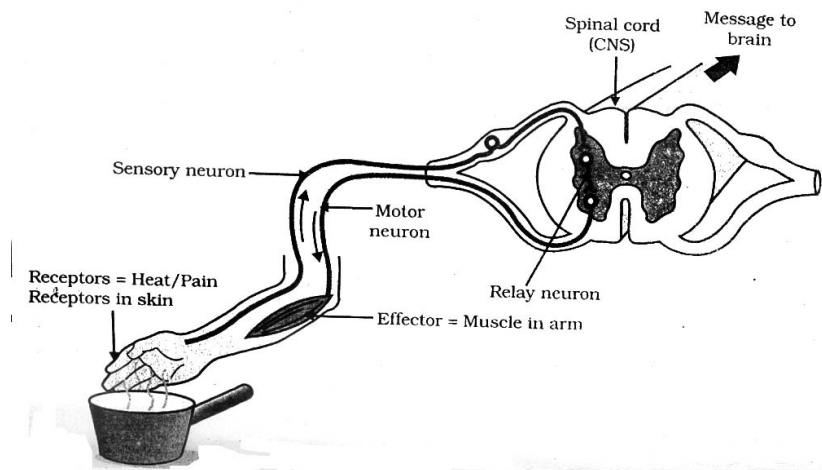
1

19. (d)

1

1955/1905/(Set : A, B, C & D)

- 20.** The seed contains future plant or embryo which develops into a seedling under appropriate conditions. 1
- 21.** (c) Third 1
- 22.** Substances which are broken down by biological processes. 1
- 23.** In Hydra, a bud develops as an outgrowth due to repeated cell division at one specific site. These buds develop into tiny individuals & when fully mature, detach from the parent body & become new independent individuals. 2
- 24.** (i) Various informations from environment are detected by specialized tips of some nerve cells called receptors present on sense organs. 1
- (ii) (a) Gustatory - Detect taste $\frac{1}{2}$
- (b) Olfactory - Detect smell. $\frac{1}{2}$

25. Diagram with labeling

Reflex arc

2

- 26.** When pea plants showing two different characteristics are bred with each other. Tall plant with round seeds & a short plant with wrinkled seeds, all are tall & have round seeds. Tallness & round seeds are dominant character but when F₁ progeny generates F₂ progeny by self pollination some F₂ progeny are tall plants with round seed & some with short plants with wrinkled seeds. However there would be some

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new mixtures i.e. tall with wrinkled seeds & short with round seeds. Thus there are inherited independently. 4

(Any other suitable example showing independent inheritance should be given credit)

27. See page No. **100** Science Text book for Class **X**. 6

OR

See page No. **104** Text book for Class **X**. 6

SET – C

SECTION – A [Marks : 20

(Physics)

1. (d) Scattering 1

2. (c) Iris 1

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P. T. O.

3. (c) Remain same 1
4. (a) Methane 1
5. When wood is burnt in a limited supply of oxygen; water and volatile materials present in it get removed and residue left is called charcoal. Charcoal burns without flames and is smokeless and higher heat generation efficiency. 2

6. Heat, $H = 150\text{J}$

$$R = 6 \Omega$$

$$t = 1 \text{ sec.}$$

$$V = ?$$

$$I = \sqrt{\frac{H}{Rt}} = \sqrt{\frac{150}{6 \times 1}} = 5\text{A}$$

$$\therefore \text{Pot. diff. } V = IR = 5\text{A} \times 6\Omega = 30 \text{ Volts.} \quad 2$$

7. Water in the ground does not evaporate rather it spreads to recharge wells and provides moisture

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for vegetation. It is almost protected from contamination by human and animal waste. 2

8. Ray Diagram

Explanation of position, size and nature of image

1 + 1 + 1 + 1

9. Explanation 4

Fleming left hand rule 1

Devices used are electric motor, electric generator, loud speakers, microphones etc. 1

OR

Same as Ans. of Ist part of Question **9** of **Set - A.** 6

SECTION – B

[Marks : 19

(Chemistry)

10. (a) 1

11. (c) 1

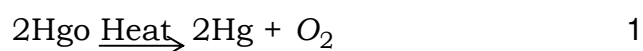
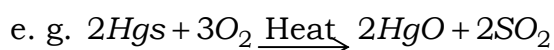
1955/1905/(Set : A, B, C & D)

P. T. O.

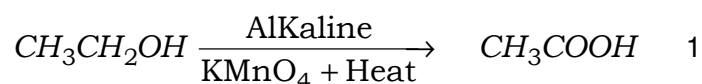
12. (b) 1
13. The reaction in which an element displace another element from its salt solution is called displacement reaction. 1
- e. g. $Zn(s) + Cu SO_4 (aq) \rightarrow Zn SO_4(aq) + cu (s)$ 1
9. When pH of rain water is less than 5.6, it is called acid rain. 1
- When acid rain flows into rivers, it lowers the pH of the river water. The survival of aquatic life in such rivers become difficult. 1
15. Helium (He), Neon (Ne), Argon (Ar), Krypton (Kr) and Xenon (Xe) are non reactive elements. So these are placed in separate group in the periodic table. 2
16. (a) Ionic compounds exist in solid state due to greater force of attraction between +ve and -ve ions. 1

They have high melting point because high amount of energy is required to break strong forces interionic attraction. 1

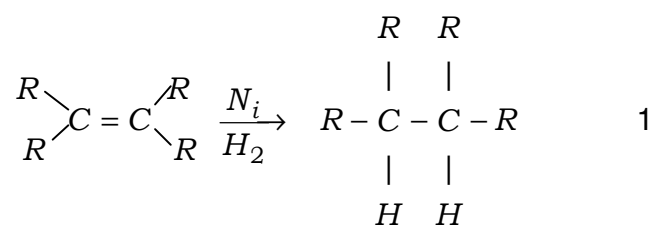
- (b) Metals low in reactivity series are very unreactive. The oxides of these metals can be reduced to metal by heating alone. 1



17. (i) **Oxidation reaction** : In these reaction oxygen is added in the reactant and a new compound is formed 1

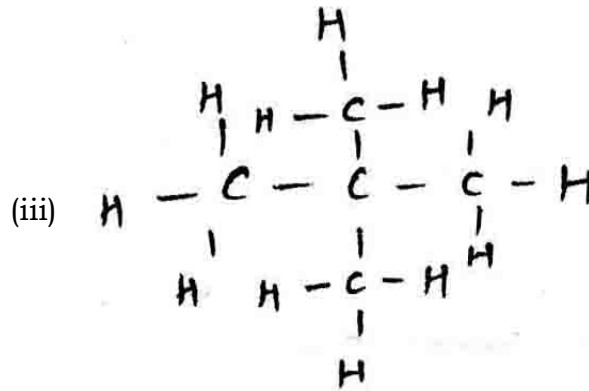


- (ii) **Addition reaction** : Unsaturated hydrocarbons add hydrogen in the presence of catalyst such as palladium or nickel to give saturated hydrocarbons. 1



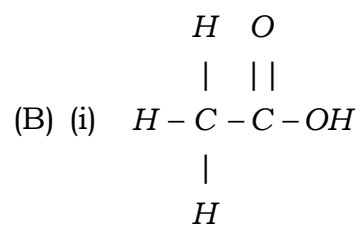
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Neo Pentane

1

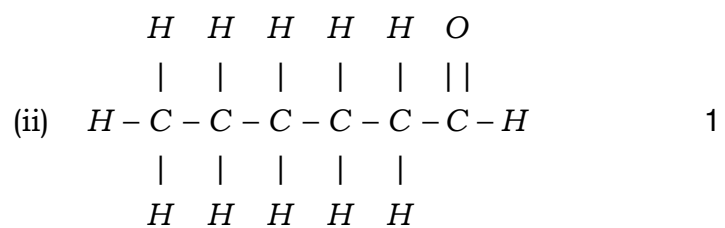


athanoic acid

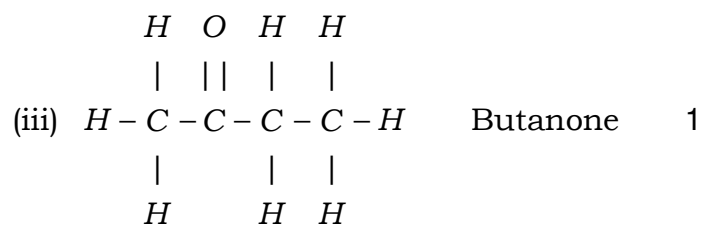
1

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Hexanal



SECTION – C

[Marks : 21

(Life Science)

18. (d) 1

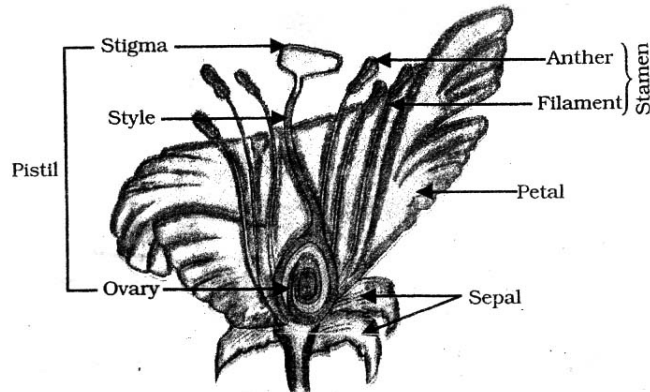
19. (b) 1

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20. (a) 1
16. (i) Layering
- (ii) Grafting 1
22. The communication between the central nervous system and other parts of the body by peripheral nervous system consisting of cranial & spinal nerves. 1
23. (i) **Medulla** controls involuntary actions i.e. blood pressure, salivation and vomiting. 1
- (ii) **Cerebellum** is responsible for precision of voluntary actions & maintaining the posture & balance of body. 1
24. (i) **Biotic components** : Living organisms such as plants animals & microorganisms. 1

- (ii) **Abiotic components** : Physical factors like temp, rainfall, wind, soil & minerals. 1

25. Diagram with labelling



2

26. Wild cabbage is cultivated as a food plant & generated different vegetables from it by artificial selection.

- (i) Some farmers have wanted to select for very short distances between leaves & have bred cabbage we eat.
- (ii) Some have wanted to select for arrested flowers & have bred broccoli.

(iii) For sterile flowers & have made cauliflower.

(iv) For swollen parts come up with kohlrabi &
with larger leaves with kale. $1 \times 4 = 4$

27. See page No. **110-111** Science Text book for
Class **X**. 6

OR

(i) See page No. **96** Science Text book for
Class **X**. 4

(ii) See page No. **97** Science Text book for
Class **X**. 2

SET – D

SECTION – A [Marks : 20

(Physics)

1. (c) Scattering 1
1955/1905/(Set : A, B, C & D) P. T. O.

2. (b) Cornea 1
3. (a) Remains same 1
4. (d) Solar energy 1
5. Biogas is an excellent fuel as it burns without smoke and leaves no residue. Its heating capacity is high also slurry left behind is used as good manure. 2
6. Power, $P = VI$
 $= 220 \times 4 = 880 \text{ W}$
 \therefore Energy consumed in 3 hours
 $P \times t = 880 \times 3 \times 3600$
 $= 9.504 \times 10^6 \text{ Joules}$ 2
7. Watershed management increases the production and income of watershed community. It resolves the problem of droughts

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and floods and increases the life of downstream
dam and reservoirs. 2

8. Ray diagram 1

Explanation of position, nature & size of image

1 + 1 + 1

9. Explanation 4

Right hand thumb rule 2

OR

Same as Ans of Part (i) of Question **9** of

SET – B. 6

SECTION – B

[Marks : 19

(Chemistry)

10. (b) 1

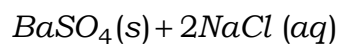
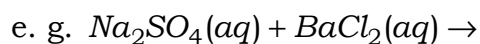
1955/1905/(Set : A, B, C & D)

P. T. O.

11. (d) 1

12. (c) 1

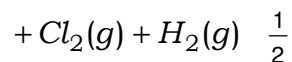
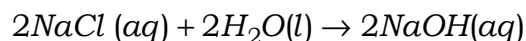
13. A reactions in which a precipitate is formed is called precipitation reaction. 1



Precipitate 1

14. When electricity is passed through an aqueous solution of sodium chloride, it decomposes to form sodium hydroxide. The process is called chlore-alkali process because of products formed chlor for chlorine and alkali for sodium hydroxide. $1\frac{1}{2}$

Reaction :



15. Metallic character decreases on moving left to right in a period. 1

Non metallic character increases in a period. 1

16. (a)

Element	K	L	M
Al	2	8	3
S	2	8	6

2

(b) Sodium is very reactive metal. It reacts with atmospheric moisture and catches fire. Hence it is stored in kerosene oil. 2

17. (a) (i) Molecular mass of two consecutive homologue differ by 14u. 1

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(ii) They differ by $-CH_2$ unit. 1

(iii) Chemical properties remains same. 1

(b) (i) $CH_3 - CH_2 - CHO$ - Propanal 1

(ii)
$$\begin{array}{c} O \\ || \\ CH_3 - C - CH_3 \end{array}$$
 - Propanone 1

(iii) $CH_3 - CH_2 - CH_2 - Br$ - Bromopropane 1

OR

(a) (i) **Sodium carbonate test** : When a pinch of sodium carbonate is added to alcohol of acid, acid will give effervescence where as alcohol do not.

2

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- (ii) Basic pol. per magnate test - Colour of pot permagnate disappear in alcohol but it remain unchanged in carhoxylic acid. 2

(b) Uses of ethanol :

- (i) It is used in medicines such as tincture of iodine, cough syrups of many tonics. 1
- (ii) It can be used as additive in petrol. It is also used as beverages. 1

SECTION – C

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(Life Science)

18. (d) 1

19. (a) 1

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P. T. O.

20. Because sperm formation requires lower temperature than normal body temperature. 1

21. (b) 1

22. United Nations Environment Programme. 1

23. Heart beats faster, resulting in supply of more O_2 to our muscles.

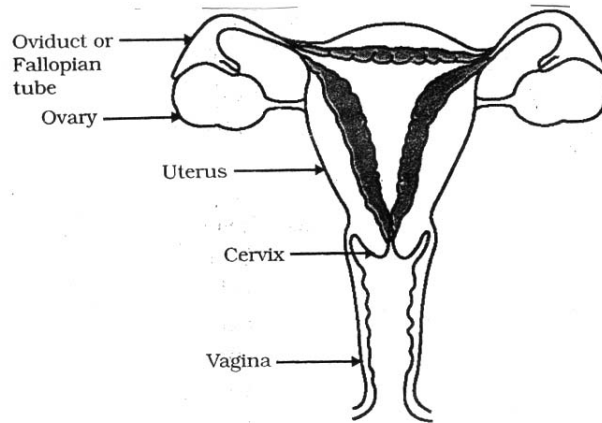
Breathing rate also increases. These responses together enable the animal body to be ready to deal with the situation & constitute a second way of control & coordination of body. 2

24. (i) Prostate and seminal vesicles.

(ii) (a) Add their secretions so that the sperms are in a fluid & make their transport easier. 1

(b) Provide nutrition. 1

25.



2

21. All humans are a single species. The earliest members of the human species, *Homo sapiens*, can be traced in Africa. A couple of hundred thousand years ago some of our ancestors left Africa. While others stay on, migrants slowly spread from Africa to west Asia, then to central Asia, Eurasia, South & East Asia & travelled down the islands of Indonesia. They did not go to a single line, went forward and backward, sometimes separating and coming back to mix with each other even moving in & out of Africa & were trying to live their lives the best they could.

4

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22. See page No. **98** Science Text book for Class **X.** 6

OR

See page No. **108** Text book for Class **X.** 6



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