

7. SCIENCE
Sample Question Paper
Class-X
2011-2012
Summative Assessment - II
Design of the Question paper

TIME : 3 Hrs

MM : 80

| S. No. | Content | Marks Theory | Marks MCQ | Total |
|--------|--|--------------|-----------|-------|
| 1. | Chemical Substances- Nature & Behaviour | 16 | 5 | 21 |
| 2. | World of Living | 21 | 6 | 27 |
| 3. | Natural Phenomenon | 21 | 5 | 26 |
| 4. | Natural Resources | 6 | - | 6 |
| | | 64 | 16 | 80 |

Weightage to form of questions

| S. No. | Form of Question | Marks for each Question | No. of Questions | Total Marks |
|--------|------------------|-------------------------|------------------|-------------|
| 1. | V S A | 1 | 4 | 4 |
| 2. | SA-I | 2 | 9 | 18 |
| 3. | SA-II | 3 | 9 | 27 |
| 4. | LA | 5 | 3 | 15 |
| | MCQ | 1 | 16 | 16 |
| | Total | | 41 | 80 |

Sample Question Paper
SCIENCE
Class-X
Summative Assessment - II
2011-2012
Blue Print

| S. No. | Form of Questions | VSA | SA-I | SA-II | LA | MCQ | Total |
|--------------|--|----------------|-------------------|--------------|-------------|-------------|-------------------------------|
| UNITS | | | | | | | |
| 1. | Chemical Substances- Nature and Behaviour a) Carbon compounds b) Periodic classification of elements | 1(1) – | – 4(2) | 3(1) 3(1) | 5(1) – | 5(5) – | 14 7 } ²¹⁽¹¹⁾ |
| 2. | World of Living a) Reproduction b) Heridity and evolution | – – | 4(2) – | 3(1) 9(3) | 5(1) – | 6(6) – | 18 9 } ²⁷⁽¹³⁾ |
| 3. | Natural Phenomenon a) Reflection and refraction of light b) Human eye and the colourful world | – 1(1) | 2(1) 4(2) | 6(2) 3(1) | 5(1) – | 5(5) – | 18 8 } ²⁶⁽¹³⁾ |
| 4. | Natural Resources a) Fossil fuels b) Management of natural resources, The regional environment c) Our environment | – – 2(2) | 2(1) 2(1) – | – – – | – – – | – – – | 2 2 2 } ⁶⁽⁴⁾ |
| | | 4(4) | 18(9) | 27(9) | 15(3) | 16(16) | 80 (41) |

Sample Question Paper
SCIENCE (Theory)
Class-X
Summative Assessment - II
2011-2012

Time : 3 hours

Maximum Marks : 80

General Instructions:

- i) The question paper comprises of two sections, A and B. You are to attempt both the sections.
- ii) All questions are compulsory.
- iii) There is no over all choice. However, internal choice has been provided in all the three question of five marks category. Only one option in such question in to be attempted.
- iv) All questions of section A and all questions of section B are to be attempted separately.
- v) Question numbers 1 to 4 in section A are one mark questions. These are to be answered in one word or one sentence.
- vi) Question numbers 5 to 13 are two mark questions, to be answered in about 30 words each.
- vii) Question numbers 14 to 22 are three mark questions, to be answered in about 50 words each.
- viii) Question numbers 23 to 25 are five mark questions, to be answered in about 70 words each.
- ix) Question numbers 26 to 41 in section B are multiple choice questions based on practical skills. Each question is a one mark question. You are to select one most appropriate response out of the four provided to you.

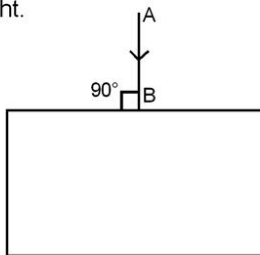
Section (A)

1. List the three phenomenon of light responsible for formation of rainbow in the sky.
2. Draw the electron-dot structure of ethane molecule (C_2H_6).
3. List any two common methods by which solid wastes of urban areas are disposed off.
4. Identify which one of the following would have a hazardous impact if they persist in the environment for a long time:
Newspaper, vegetable peels, pesticides, waste from cattle shed.
5. Why do we see stars twinkling whereas, planets do not twinkle?
6. An object is placed perpendicular to the principal axis of a convex lens of focal length 10 cm. The distance of the object from the optical centre of the lens is 15 cm. Find the position and nature of the image formed.

7.
 - i) What is meant by power of accommodation of eye?
 - ii) How does focal length of the eye lens change when we shift looking from a distant object to a nearby object?
8.
 - a) Why are coal and petroleum called fossil fuels?
 - b) Name the two elements which are present both in CNG and petroleum.
9.
 - (i) State the position of hydrogen in the modern periodic table.
 - (ii) Where are isotopes of the same element having different atomic masses placed in the periodic table?
10. Account for the following:
 - (i) Elements in a group of the periodic table have similar chemical properties.
 - (ii) Elements of group 18 are called zerovalent.
11. "Construction of dams ensures electricity generation for a large number of villages". State two reasons for opposition to construction of dams inspite of this advantage.
12.
 - a) Which glands contribute fluid to the semen?
 - b) State two advantages semen offers to the sperms.
13. List two advantages of vegetative propagation in plants. In which two of the following plants is vegetative propagation practised?

Banana, Rice, Tomato, Rose

14.
 - i) Define power of a lens and write its S.I. unit.
 - ii) The image of an object formed by a convex lens is of the same size as the object. If the image is formed at a distance of 50 cm from the lens, at what distance from the lens is the object placed? Find the focal length and power of the lens used.
15. A person cannot see objects farther than 10 m from the eye clearly. Name the defect of vision he is suffering from. How can it be corrected? Draw ray diagrams for (i) the defective eye, (ii) its correction.
16.
 - i) A ray of light AB is incident on a glass slab, as shown. Mention the values of angle of incidence and angle of refraction for this ray of light.



- ii) Light enters from air into a glass plate having refractive index 1.5. Calculate the speed of light in glass. (speed of light in air = 3×10^8 m/s)

17. What is saponification? Explain the cleansing action of soap.
18. How would the following properties of the element vary along the period from left to right in the modern periodic table. Give reasons in each case.
- Tendency to lose electrons
 - Atomic size
 - Valency
19. a. What are fossils?
b. A child finds a fossil of a leaf. List and describe two ways to decide how long ago the leaf was part of a living tree.
20. "The sex of the new born child depends on its father and not on its mother." Justify the statement and support your answer with a neat illustration.
21. What are acquired traits? "Acquired traits are not capable of directing evolution". Justify this statement by giving at least two reasons.
22. List and describe in brief any three methods of birth control.
23. Name the type of mirror (s) that should be used to obtain
- a magnified and virtual image of an object.
 - a diminished and virtual image of an object.

Draw labelled ray diagrams to show the formation of the required image in each of the above two cases. Which of these mirrors could also form a magnified and real image of the object? State the position of object for which this could happen.

OR

- (a) Draw a ray diagram for each of the following cases to show the position and nature of the image formed when the object is placed:
- between optical centre and principal focus (F) of a convex lens.
 - between F and 2F of a convex lens.
 - at 2F of a convex lens.
- (b) How will the nature and position of image formed change in cases (i) and (ii) of part (a) of this question if the convex lens is replaced by a concave lens?
24. a) Complete the following equations:
- $\text{CH}_4 + \text{O}_2 \longrightarrow$
(Excess)
 - $\text{CH}_3\text{COOH} + \text{C}_2\text{H}_5\text{OH} \xrightarrow{\text{Acid}}$



b) Write the IUPAC name of the next homologue of (i) CH_3OH , (ii) $\text{CH}_2 = \text{CH}_2$

OR

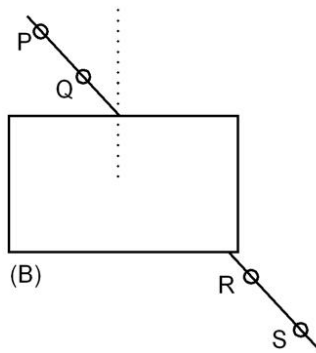
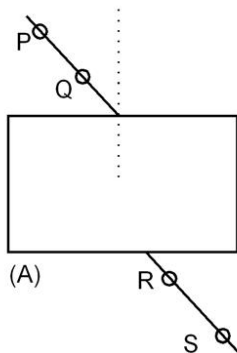
- (a) Define homologous series of organic compounds. Mention any two characteristics of homologous series.
- (b) Name the compound formed on heating ethanol at 443K with excess of conc. H_2SO_4 .
- (c) Describe a chemical test to distinguish between ethanol and ethanoic acid.
25. (a) Name one organ each in human female and male reproductive system which plays a role of endocrine gland along with production of germ cells. Name one hormone secreted by each of them.
- (b) State two advantages to the development of the embryo in the mother's womb.
- (c) Where does fertilization occur in case of human female and name the place where fertilized egg gets implanted.

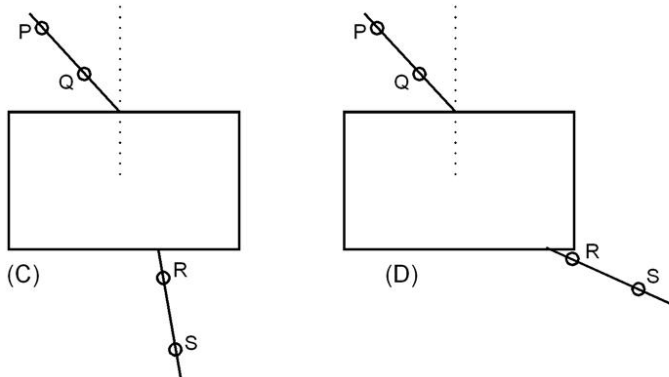
OR

- (a) Give an example of a bisexual flower. What is its female reproductive part known as?
- (b) Draw a longitudinal section of female reproductive part of a flower showing the process of germination of pollen on stigma and label the following on it:
- (i) male germ cell (ii) female germ cell
- (iii) ovary (iv) pollen tube
- (c) Pollination may occur without fertilization but fertilization will not take place without pollination. Give reason.

Section (B)

26. Four students A,B,C and D traced the path of a ray of light passing through a glass slab placed in air. Their observations about incident and emergent ray were recorded as given below:

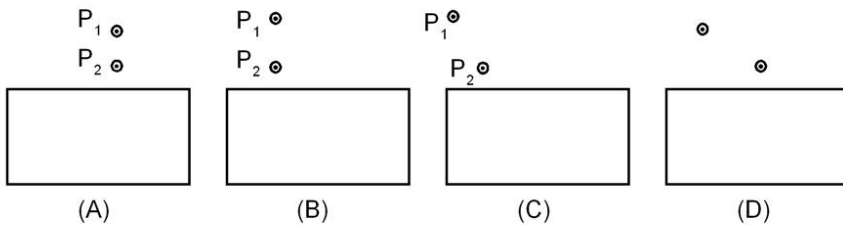




The student who made the correct observation is:

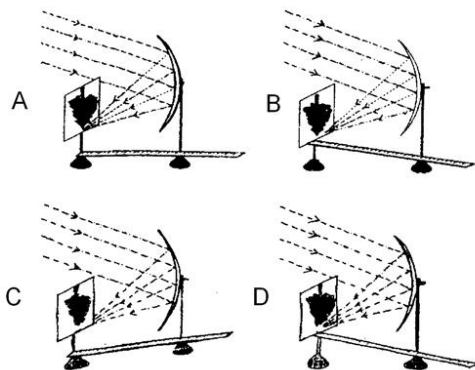
- a) A b) B c) C d) D

27. While tracing the path of a ray of light passing from air through a rectangular glass slab, the setup, in which the best result will be obtained is.



- a) A b) B c) C d) D

28. Four students A, B, C and D carried out measurement of focal length of a concave mirror, as shown in the diagrams given below:



The correct focal length will be obtained by student

- a) A b) B c) C d) D

29. To find the focal length of a concave mirror, the four students, Ram, Shamim, Kamla and Ruksana obtained the image of the window grill on a wall. They measured the distances as given below between

- Ram - window grill and the wall only
- Shamim - window grill and the mirror only
- Kamla - mirror and wall only
- Ruksana - window grill and the wall and also between the mirror and the wall

Correct focal length will be obtained by the student

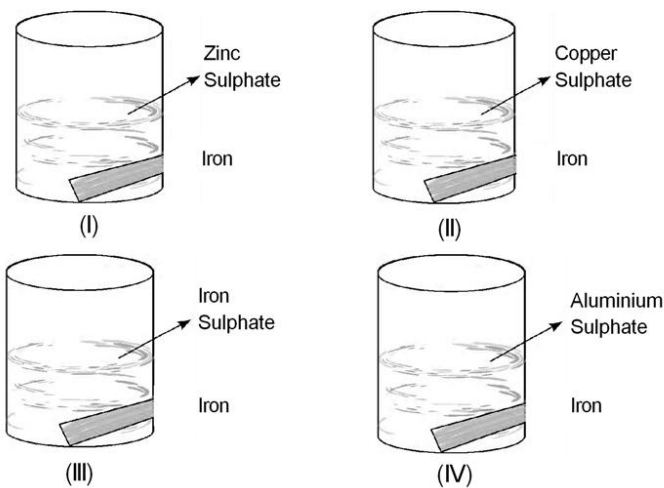
- a) Ram b) Shamim c) Kamla d) Ruksana

30. Which of the following set of materials represents the minimum material required for determining the focal length of a convex lens by obtaining the image of a distant object on a screen in a school laboratory.

- i) Set A - A candle, a match box, a convex lens, a lens holder, a screen with stand.
- ii) Set B - A lens holder, a convex lens, a concave lens, a measuring scale.
- iii) Set C - A Convex lens, a lens holder, a screen with a stand, a measuring scale.
- iv) Set D - A convex lens, a burning candle, a screen with stand, a lens holder.

- a) Set A b) Set B c) Set C d) Set D

31. An iron strip was left dipped in aqueous zinc sulphate, copper sulphate, iron sulphate and aluminium sulphate solutions, as shown below by Rahul in his school laboratory. He would observe the deposition of metal on iron in beakers :



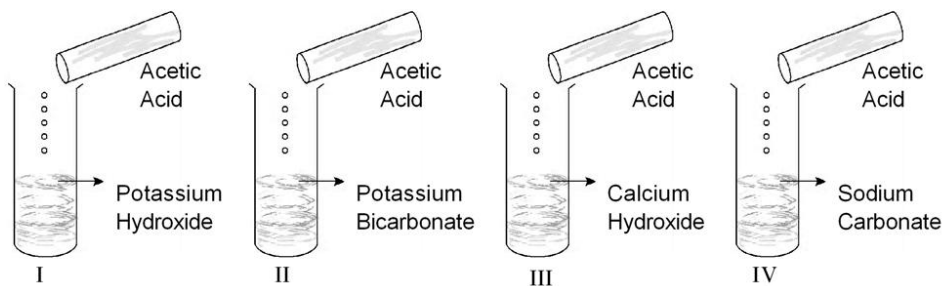
- a) I and II b) II c) III d) III and IV

32. Aqueous solution of copper sulphate and iron sulphate were taken in test tubes I and II by four students A, B, C and D. Metal pieces of iron and zinc were dropped in the two solutions and observations made after several hours and recorded in the form of a table as given below.

| Observation by | Metal | Solution | Colour Changes of Solutions | Deposits / Residue obtained |
|----------------|-------|-----------------|-----------------------------|-----------------------------|
| A | Fe | CuSO_4 | Turned green | Silver grey coating |
| | Zn | FeSO_4 | Turned blue | No change |
| B | Fe | CuSO_4 | No change | Black residue |
| | Zn | FeSO_4 | Colour faded | Grey coating |
| C | Fe | CuSO_4 | Turns green | Reddish brown coating |
| | Zn | FeSO_4 | Turns colourless | Black residue |
| D | Fe | CuSO_4 | No change | Grey residue |
| | Zn | FeSO_4 | No change | Black residue |

The correct observations were made by

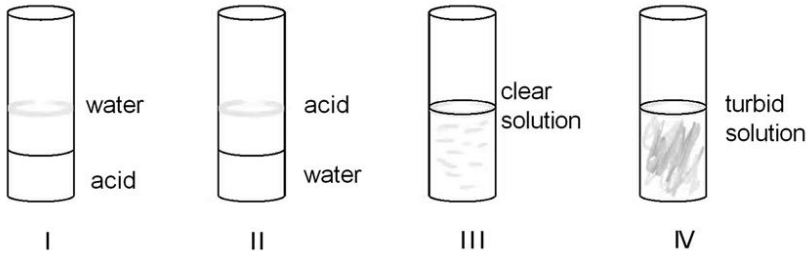
- a) A only b) A and B c) C only d) B and D
33. Dilute acetic acid was added to the four test tubes containing the following chemicals:
- KOH
 - NaHCO_3
 - K_2CO_3
 - NaCl
- Brisk effervescence was observed in test tubes:
- a) I and II b) II and III c) I and IV d) II & III
34. A student added acetic acid to test tubes I, II, III, IV



The lighted candle would be extinguished when placed near the mouth of the test tube

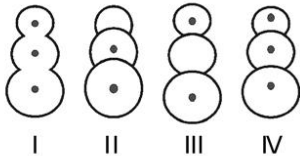
- a) I and II b) II and III c) II and IV d) I and IV

35. 10 mL each of acetic acid and water are mixed together and shaken in four different test tubes as given below:



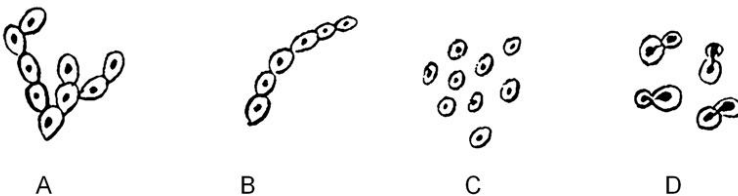
The resulting mixture after standing would appear as shown in test tube

- a) I b) II c) III d) IV
36. Following diagrams were drawn by four different students on having seen a prepared slide of budding in yeast.



The correct diagram is

- a) I b) II c) III d) I and IV
37. Which of the following figures does not show budding.



- a) B
b) C
c) A
d) D
38. A teacher soaked 10 raisins in 35 mL of distilled water in a beaker labelled A and similar activity she performed and labelled the other beaker B. She maintained the temperature of beaker A at 20°C and of beaker B at 40°C.

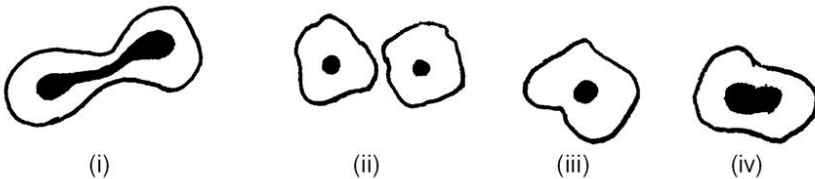
After an hour what will be the percentage of water absorbed by raisins in beaker A and by those in beaker B

- a) the same
- b) more in A and less in B
- c) more in B and less in A
- d) exactly twice as much in B as in A

39. A student soaked 10 g of raisins in 25mL of water in beaker A and 20 g of raisins in 50mL of water in beaker B and measured the quantity of water left in the beakers after an hour. What will he find?

- a) There will be no change in the quantity of water in beakers A and B
- b) Beaker B will have as much water as in beaker A
- c) Beaker B will have more water than beaker A
- d) Beaker A will have more water than beaker B

40. The following figure illustrates binary fission in Amoeba. Choose the option giving the correct sequence.



- a) (i), (iv), (iii), (ii)
- b) (iii), (iv), (i), (ii)
- c) (iv) (ii), (i), (iii)
- d) (iii) (iv) (ii) (i)

41. If x represents weight of soaked raisins and y represents weight of dry raisins then the formula to calculate percentage of water absorbed by raisins is :

- a) $\frac{(y-x)}{x} \times 100$
- b) $\frac{(x-y)}{y} \times 100$
- c) $\frac{(y-x)}{y} \times 10$
- d) $\frac{(x-y)}{y} \times 10$

Marking Scheme
SCIENCE (Theory)
Class-X
2011-2012 (SA - II)

Time : 3 hours

Maximum Marks : 80

1. Refraction, Dispersion, internal reflection 1
 2. Fig 4.6 Page 63, NCERT

1

3. Buried in landfills, composting, recycling, incineration (any two) $\frac{1}{2}$, $\frac{1}{2}$

4. Pesticides, 1

5. Stars, being very distant, approximate point sized sources of light. The apparent position of star fluctuates due to atmospheric refraction giving us the twinkling effect $\frac{1}{2}$, $\frac{1}{2}$

Whereas, planets being much closer to the earth are seen as extended sources of light. Thus the total variation in the amount of light entering our eyes from all point sized sources averages out to zero. $\frac{1}{2}$, $\frac{1}{2}$

6. $f = +10$ cm $u = -15$ cm $v = ?$

$$\frac{1}{f} = \frac{1}{v} - \frac{1}{u} \quad \frac{1}{2}$$

$$\therefore \frac{1}{v} = \frac{1}{f} + \frac{1}{u}$$

$$= \frac{1}{+10\text{cm}} + \frac{1}{(-15)\text{cm}} = \frac{1}{10\text{cm}} - \frac{1}{15\text{cm}} = \frac{3-2}{30\text{cm}} = \frac{1}{30\text{cm}} \quad \frac{1}{2}$$

$$= \frac{1}{30\text{cm}}$$

$$\therefore v = +30$$
 cm

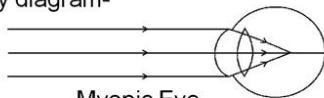
Image is formed at a distance of 30 cm on the other side of the optical centre of the lens.
 Nature of image- Positive sign of v indicates that the image formed is real and inverted $\frac{1}{2}$

7. i) Power of accommodation of the eye is the ability of the eye lens to adjust its focal length to see nearby and distant objects clearly. 1
 ii) Focal length of the eye lens is reduced. 1
- 8 a) Coal and petroleum are formed from the degradation of biomass buried millions of years ago. 1
 b) Carbon and Hydrogen 1
- 9 (i) Hydrogen is monovalent and electropositive in property, therefore it is placed with group I element whereas it forms hydride with Na, K,..... So it can be placed with halogen family also. 1
 (ii) In Modern Periodic Table elements are arranged in increasing order of atomic number and not atomic masses. Therefore the isotopes are placed in the same group. 1
- 10 (i) The chemical properties of an element are determined by its valence electrons. Since in a group all the elements have the same number of valence electrons, they exhibit similar chemical properties. 1
 (ii) Group 18 elements have their outermost shell complete. 1
- 11 Dams may : displace large number of villagers / swallow public money without generating proportionate income or benefit / lead to loss of biodiversity / cause large scale deforestation. (any two)1,1
- 12 a) Prostate glands and seminal vesicles. $\frac{1}{2}, \frac{1}{2}$
 b) Semen provides nutrition for the sperms. Semen also makes the transport easier for the sperms through its fluid medium. $\frac{1}{2}, \frac{1}{2}$
- 13 Bear flower and fruits earlier/ Genetically similar/ Plants without seeds can also be reproduced (any two) $\frac{1}{2}, \frac{1}{2}$
 Banana, Rose $\frac{1}{2}, \frac{1}{2}$
- 14 i) Power of a lens is defined as the reciprocal of its focal length / Degree of convergence or divergence of light achieved by a lens. $\frac{1}{2}$
 S. I. unit is dioptre $\frac{1}{2}$
 ii) $v = +50$ cm, size of image = size of object $\frac{1}{2}$
 \therefore = The object is placed at 2F in front of the lens and image is formed at 2F on the other side of the lens.
 $\therefore 2F = +50$ cm i.e., the object is placed at a distance of 50cm from the optical centre of the lens. $\frac{1}{2}$
 \therefore Focal length of the lens $f = +\frac{50}{2} = +25$ cm $\frac{1}{2}$

$$P = \frac{1}{f} = \frac{1}{\frac{+25}{100}} = \frac{+100}{25} = +4D \quad 1$$

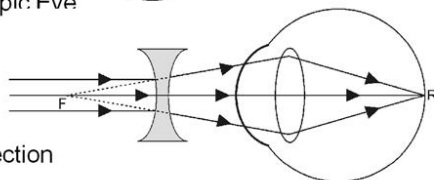
- 15 Defect of vision - myopia /nearsightedness/ shortsightedness. ½
 Correction - by the use of concave lens of suitable power ½

Ray diagram-



Myopic: Fve

1



Correction

1

- 16 i) Angle of incidence = 0°; Angle of refraction = 0° ½, ½

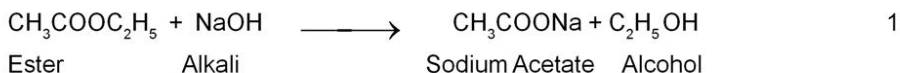
ii) Refractive index of glass $n_g = \frac{\text{speed of light in air}}{\text{speed of light in glass}}$ ½

$$\therefore \text{Speed of light in glass} = \frac{\text{speed of light in air}}{\text{refractive index of glass}}$$

$$= \frac{3 \times 10^8}{1.5} \quad ½$$

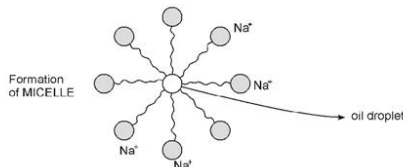
$$= 2 \times 10^8 \text{ m/s} \quad 1$$

- 17 a) Breaking of an ester molecule by acid or alkali to give alcohol and sodium salt of carboxylic acid is known as saponification.



- b) Cleansing action of soap

Soap is the sodium or potassium salt of organic acid. Most dirt is oily by nature, soap molecules form structures called MICELLES, where one end of the molecule is towards the oil droplet, the ionic end faces outside. This forms an emulsion in water, which helps in pulling out the dirt from the fabric and the soap micelle helps in dissolving the dirt in water.

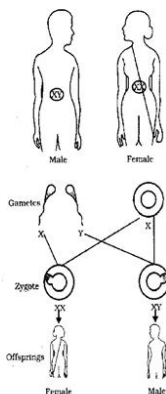


- 18 a) As we move from left to right along the period, tendency to lose electrons by the elements decreases. As the effective nuclear charge acting on the valence shell electrons increases across the period, the tendency to lose electrons will decrease. 1
- b) From left to right, as electrons are added in the same shell effective nuclear pull increases due to the increase in the number of protons in the nucleus, leading to more of contraction in the size of atom, therefore size of atom decreases from left to right in a period. 1
- c) Valency of elements increases from 1 to 4 and decreases to zero as we move from left to right along the period.

| | | | | | | | | |
|-----------|---|---|----|----|----|----|----|----|
| Group No. | 1 | 2 | 13 | 14 | 15 | 16 | 17 | 18 |
| Valency | 1 | 2 | 3 | 4 | 3 | 2 | 1 | 0 |

- 19 a) Fossils are preserved traces of living organisms. 1
- b) i) Fossils closer to the surface are more recent compared to those found in the deeper layers. 1
- ii) Another way is by detecting the ratio of different isotopes of the same element in the fossil material. 1

20

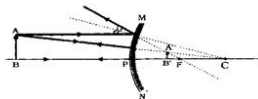
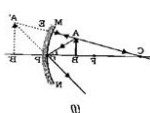


1 + 1

A child who inherits an X chromosome from his father would be a girl (XX) while the child who inherits a Y chromosome from the father would be a boy (XY). $\frac{1}{2} + \frac{1}{2}$

- 21 a) Traits developed during the lifetime of an individual are called acquired traits. Acquired characters are changes in characters which occur in non reproductive tissues. 1

- b) No change occurs in genes of the germ cells.
 ii) Since no change in genes and hence not inherited and no change is next generation / no evolution. 1
- 22 i) One category is the creation of a mechanical barrier so that the sperm does not reach the egg, eg, condoms. 1
 ii) Another category of contraceptives bring about change of hormonal balance so that eggs are not released and fertilization does not occur, eg, oral pills. 1
 iii) Contraceptives such as intrauterine devices, eg, copper -T. 1
23. i) Concave mirror 1/2
 ii) Convex mirror 1/2
 Ray diagrams

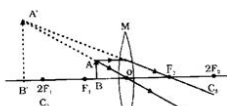


1 1/2

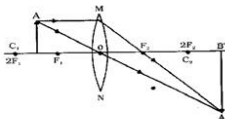
Concave mirror can also form a magnified and real image. 1 1/2

Position of object for it - between focus and centre of curvature of the mirror 1/2

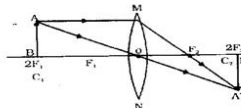
OR



(a) (i)

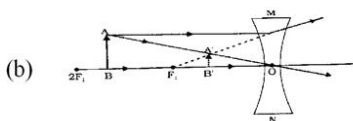


(a) (ii)



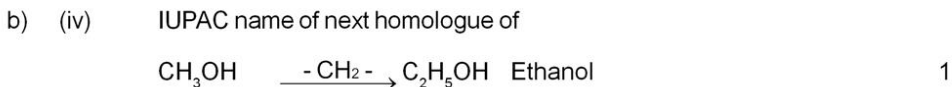
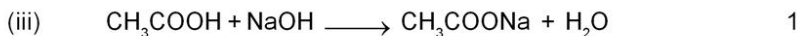
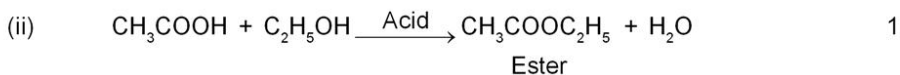
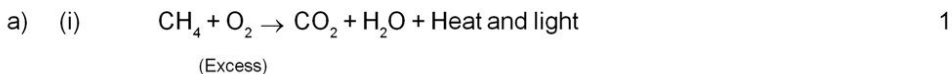
(a) (iii)

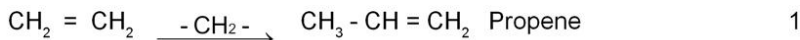
3



(b)

24. Complete the equations:- 2





OR

- a) Homologous series is a series of compounds in which the same functional group substitutes for hydrogen in a carbon chain. 1

Characteristics:

1. All the members have similar chemical properties. 1
2. There is a gradation in physical properties. 1

- (b) Ethene

- (c) Add solid NaHCO_3 : An effervescence occurs with the evolution of CO_2 in case of ethanoic acid while ethanol does not show any action. 1

- 25 a) Ovary, Testis

Oestrogen and testosterone respectively $\frac{1}{2} \times 4$

- b) i) The embryo gets nourishment and oxygen from the mother's blood through placenta. 1

ii) The embryo gets rid of its waste substances by transferring them into the mother's blood through the placenta.

- c) Oviduct/ fallopian tube lining of the uterus $\frac{1}{2} + \frac{1}{2}$

OR

a. Hibiscus or any bisexual flower $\frac{1}{2}$

b. Carpel / pistil $\frac{1}{2}$

c. Fig 8.8 pg 135 (four labels) 1, $\frac{1}{2} \times 4$

d. Fertilization refers to the fusion of the male germ cells produced by pollen with the female germ cells present in the ovule. So the pollen has to be transferred to stigma by pollination before Fertilization can take place. 1

SECTION (B)

- | | | | |
|---------|---------|---------|---------|
| 26. (a) | 27. (c) | 28. (a) | 29. (c) |
| 30. (c) | 31. (b) | 32. (c) | 33. (d) |
| 34. (c) | 35. (c) | 36. (d) | 37. (c) |
| 38. (c) | 39. (c) | 40. (b) | 41. (b) |