7. SCIENCE
Sample Question Paper
Class-X
2010-2011
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
2010-2011
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	1(1)	–	3(1)	5(1)	5(5)	14 ⎫
	b) Periodic classification						⎬ 21(11)
	of elements	–	4(2)	3(1)	–	–	7 ⎭
2.	World of Living						
	a) Reproduction	–	4(2)	3(1)	5(1)	6(6)	18 ⎫
	b) Heridity and	–	–	9(3)	–	–	9 ⎬ 27(13)
	evolution						⎭
3.	Natural Phenomenon						
	a) Reflection and	–	2(1)	6(2)	5(1)	5(5)	18 ⎫
	refraction of light						⎬ 26(13)
	b) Human eye and the	1(1)	4(2)	3(1)	–	–	8 ⎭
	colourful world						
4.	Natural Resources						
	a) Fossil Fuels	–	2(1)	–	–	–	2 ⎫
	b) Management of						
	natural resources,	–	2(1)	–	–	–	2 ⎬ 6(4)
	The regional environment						
	c) Our environment	2(2)	–	–	–	–	2 ⎭
		4(4)	18(9)	27(9)	15(3)	16(16)	80 (41)

Sample Question Paper
SCIENCE (Theory)
Class-X
Summative Assessment - II
2010-2011

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. There 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 electronic 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 where as, where as planets do not twinkle.

6. An object is placed perpendicular to the principle 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. Calculate the position of the image formed. Mention the nature of the image formed.

7.   i)   What is meant by 'power of accomodation of the eye'?

       ii)   How does the 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)   What is the position of hydrogen is 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 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 in formed at a distance of 50cm 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 A B is incident on a glass slab, as shown. Mention the values of angle of incidence and angle of refraction for this ray of light.
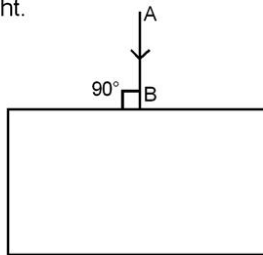
       ii)   Light enters from air into a glass plate having refraction index 1.5, Calculate the speed of light in glass. (speed of light in air = 3×10^8 m/s)

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.

   a) Tendency to lose electrons

   b) Atomic Size

   c) Valency

19. a. What are fossils? 1

   b. List and describe two ways to decide how long ago the organisms were alive. 1

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 statment by giving atleast two reasons.

22. List and describe any three methods of birth control.

23. Name the type of mirror (s) that should be used to obtain

   i) a magnified and virtual image 1

   ii) a diminished and virtual image of an object. 1

   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 in each of the following cases to show the position and nature of the image formed when the object is placed:

(i) between optical centre and principal focus (F) of a convex lens.

(ii) between F and 2F of a convex lens.

(iii) as 2F of a convex lens.

(b) How will the nature and position of image formed change in case (i) and (ii) in part (a) of this question if the lens is replaced by a concave lens?

24. a) Compete the following equations:

   i) $CH_4 + O_2$
   (excess) $\longrightarrow$

   ii) $CH_3COOH + C_2H_5OH$ $\xrightarrow{\text{Acid}}$

iii) CH_3CH_2OH $\xrightarrow[\text{443K}]{\text{Conc.}H_2So_4}$

b) Write the IUPAC name of the next homologue of CH_3OH, $CH_2 = CH_2$

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. $H_2 SO_4$.

(c) Describe a chemical test to distinguish between ethanol and ethanoic acid.

25. (a) Name one organ each in female and male reproductive system which plays a role of endocrine gland along with production of germ cells. Name one hormone secreted by each 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 know as?

(b) Draw a diagram of its longitudinal section 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:
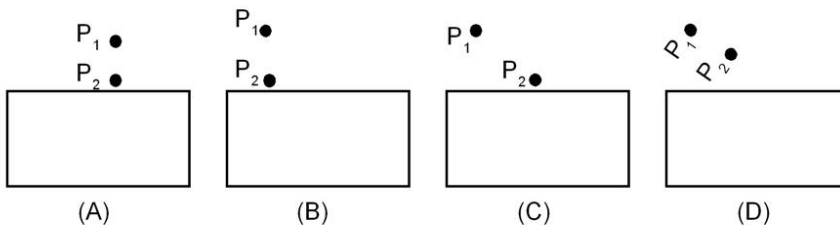

(A)   (B)

117
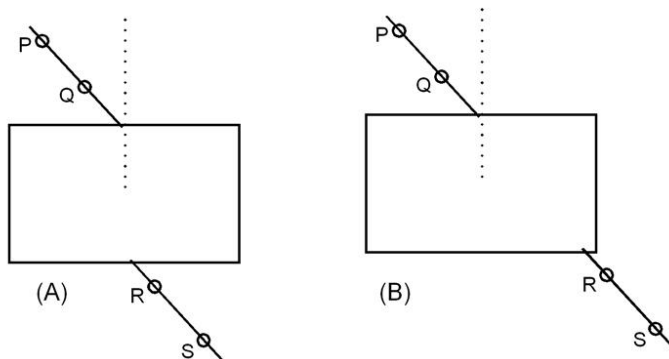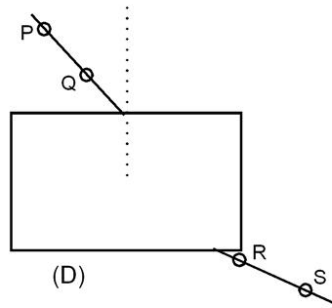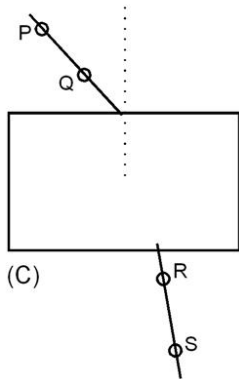
The student who made the correct observation is:

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.

P_1 ●
P_2 ●

P_1 ●
P_2 ●

P_1 ●
P_2 ●

P_1 ●
P_2 ●

(A)   (B)   (C)   (D)

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:

A

B

C

D
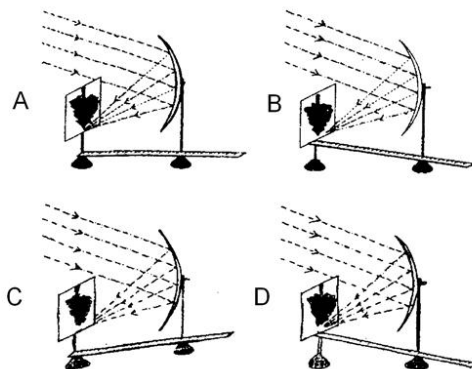
The correct focal length will be obtained by student

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 your 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.
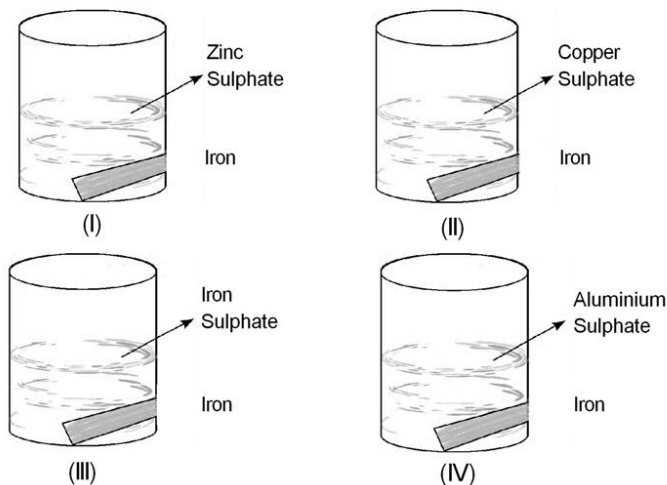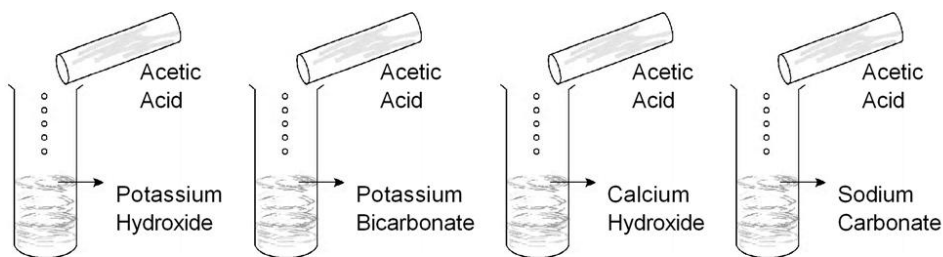

a) I & II   b) II   c) III   d) III & IV

32. Aqueous solution of copper sulphate and Iron sulphate were taken in test tubes I and II by four students A,B,C & 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	C_uSO_4	Turned green	Silver grey coating
	Zn	F_eSO_4	Turned blue	no change
B	Fe	C_uSO_4	no change	Black Residue
	Zn	F_eSO_4	colour faded	Grey Coating
C	Fe	C_uSO_4	Turns green	Reddish brown ppt
	Zn	F_eSO_4	Turns color less	Black residue
D	Fe	C_uSO_4	no change	Grey residue
	Zn	F_eSO_4	no change	Black residue

The correct observations were made by

a) A only   b) A & B   c) C only   d) B & D

33. Dilute acetic acid was added to the four test tubes contaning the following chemicals:

i   KOH

ii $Na HCO_3$

iii K_2CO_3

iv NaCl

Brisk effervescence was observed in tes tubes:

a) I & II   b) II & III   c) I & 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 & II   b) II & III   c) II & IV   d) I & IV

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

| I | II | III | IV |
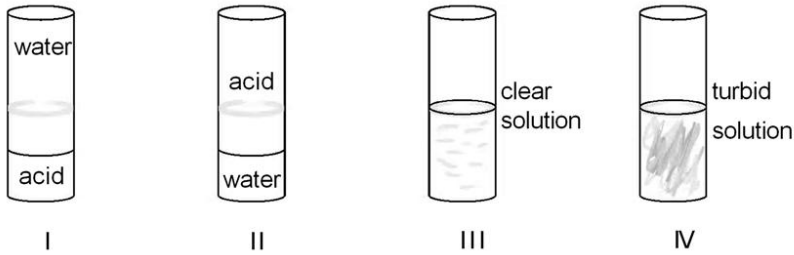
The resulting mixture after standing would appear as shown in test tube

    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.

    I   II   III   IV
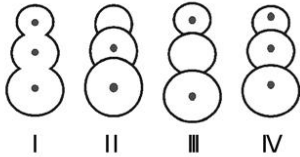
The correct diagram is

a) I   b) II   c) III   d) I and I V

37. Which of the following figures does not show budding.

    A   B   C   D
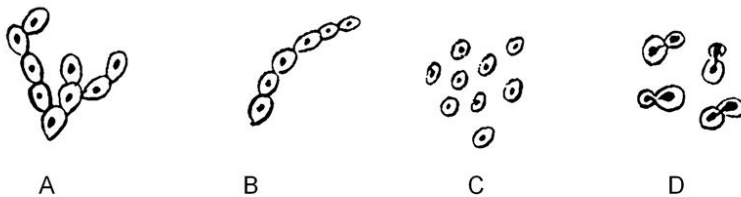
a) B

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 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 then 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.
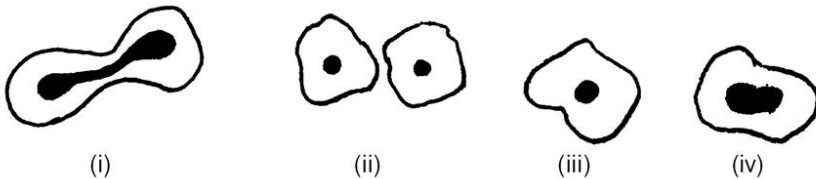
(i)   (ii)   (iii)   (iv)

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 $\frac{(x-y)}{y} \times 100$ is a way to calculate percentage of:

a) water absorbed by raisins in hypertonic solution

b) water absorbed by raisins in hypotonic solution

c) water lost by raisins in hypotonic solution

d) water lost by raisins in hypertonic solution

Marking Scheme
SCIENCE (Theory)
Class-X
2010-2011 (SA - II)

Time : 3 hours   **Maximum Marks : 80**

1.   Refraction, Dispersion, internal reflection   1

2.

                                                                             1

3.   Buried in landfills, composting, recycling,   ½ , ½
     incineration (any two)

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   ½ , ½

     Whereas, planets being much closer to the earth are seen as extented sources of light. Thus
     the total variation in the amount of light entering our eyes from all point sized sources
     averages out to zero.   ½ , ½

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

$$\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$$ ½

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

$$= \frac{1}{+10cm} + \frac{1}{(-15)cm} = \frac{1}{10cm} - \frac{1}{15cm} = \frac{3-2}{30cm} = \frac{1}{30cm}$$ ½

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

$\therefore \; v = + 30$ cm

Image in formed at a distance of 30 cm on the other side of the optical centre of the lens.
Nature of image-   ½

Positive sign of v indicates that the image formed is real and inverted   ½

123

7. i) Power of accomodation of the eye is the ability of the eye lens to adjust its focal length to see near by 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 bio-mass burried millions of years ago.   1

   b) Carbon and Hydrogen   1

9 (i) Hydrogen is monovalent and electropositve in property, therefore it is placed with Gr.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 valance 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 outer most shell complete.   1

11 Dams may :

   displace large number of villagers / swallow public money without generating proportionate income or benifit / lead to loss of biodiversity / cause large scale deforestation. (any two) 1,1

12 a) Prostate glands and Seminal vesicles.   ½ , ½

   b) Semen provides nutrition for the sperms. Semen also makes the transport easier for the sperms through its fluid medium.   ½ , ½

13 Bear flower and fruits erlier/ Genetically similar/ plants without seeds can also reproduce

   (any two) $\frac{1}{2}, \frac{1}{2}$

   Banana, Rose   ½, ½

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–   ½

   S. I unit is dioptre   ½

   ii) v   = + 50 cm, size of image = size of object   ½

       = object is placed at 2F in front of the lens and image is formed 2F on the other side of the lens

   ∴ 2 F = 50 cm object is placed 50cm from the optical centre of the lens   ½

$$\therefore \text{Focal length of the lens } f = +\frac{50}{2} = +25 \text{ cm} \qquad \text{½}$$

$$P = \frac{1}{f} = \frac{1}{25\!\big/\!100} = \frac{100}{25} = +4D \qquad 1$$

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

Ray diagram-

Myopic Eye   1

Correction   1

16 i) $L° = O°$ $L^r = O°$ ½ , ½
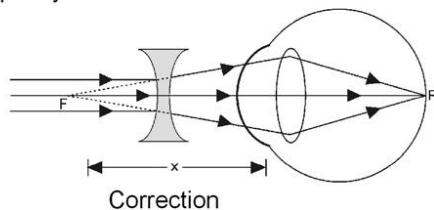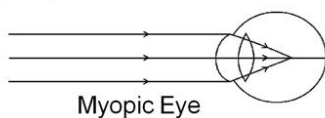
ii) Refractive index of glass n_g = $\dfrac{\text{speed of light in air}}{\text{speed of light in glass}}$

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

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

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

17 a)   Breaking of an ester molecule by Acid or Alkali to give alcohol and sodium salt of Carboxylic Acid is known an Saponification.

$CH_3COOC_2H_5$ + NaOH $CH_3COONa + C_2H_5OH$ 1

Ester   Alkali   Na-Acetate   Alcohal

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.


Formation of MICELLE
oil droplet
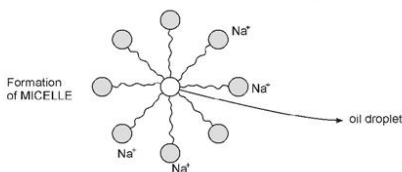
18 a) As we move from Left to Right along the period, tendency to lose electrons by the elements decreases. As the effective nuclear charge acting on the valence shell electrons increases across the period, the tendency to lose electrons will decrease.   1

   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.   1

   c) Valency of elements increases from 1 to 4 and decreases to zero as we move from Left to Right along the period.

Gp 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
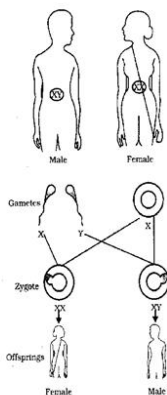
20   1 + 1

A child who inherits an X chromosome from his father would be a girl (XX) while the child who inherits a Y chromosme from the father would be a boy (XY).   ½ + ½

21 a) Traits developed during the lifetime of an inividual are called acquired traits. Acquired character 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) Contrceptives such as intrauterine devices, eg, copper -T.   1

23. i) Concave mirror   ½

    ii) Convex mirror   ½

        Ray diagrams

          1½
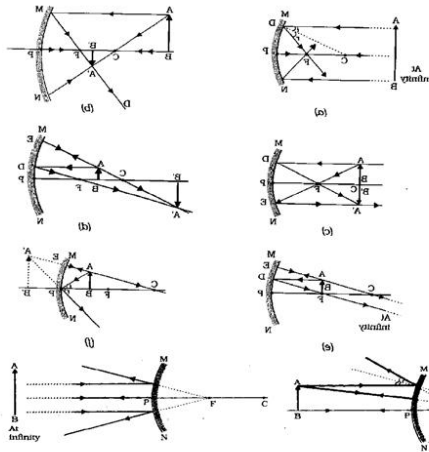
          1½
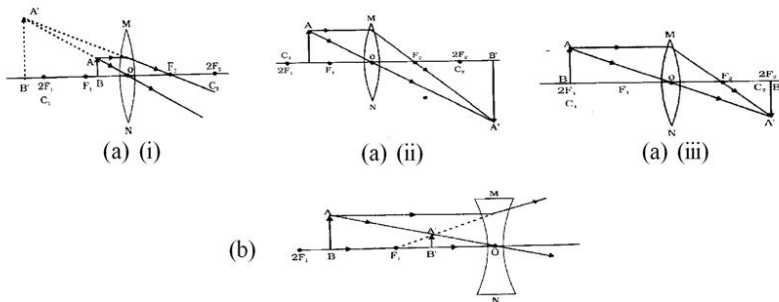
        Concave mirror can also form a magnified and real image.   ½

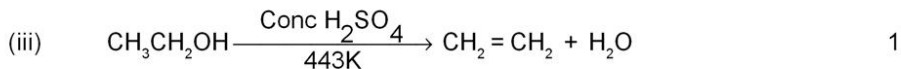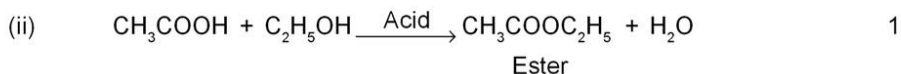   Position of object for it - between focus and centre of curvature of the mirror   ½
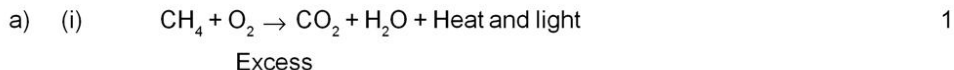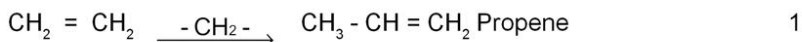
OR

(a) (i)   (a) (ii)   (a) (iii)   3

(b)   2

24. Complete the equations:-

a) (i) $CH_4 + O_2 \rightarrow CO_2 + H_2O +$ Heat and light   1

    Excess

  (ii) $CH_3COOH + C_2H_5OH \xrightarrow{Acid} CH_3COOC_2H_5 + H_2O$ 1

         Ester

  (iii) $CH_3CH_2OH \xrightarrow[443K]{Conc\ H_2SO_4} CH_2 = CH_2 + H_2O$ 1

b) (iv) PAC name of next homologue of

    $CH_3OH \xrightarrow{-CH_2-} C_2H_5OH$ Ethanol   1

    $CH_2 = CH_2 \xrightarrow{-CH_2-} CH_3 - CH = CH_2$ Propene   1

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. Till the members have similar chemical properties.   1

2. There is a gradation in physical properties.   1

(b) Ethene

(c) Add solid $Na\ HCO_3$: An effervescence occurs with the evolution of CO_2 in case of ethanoic while ethanol does not show any action.   1

25 a) Ovary, Testes

Oestrogen and testosterone respectively   ½ x 4

b) i) The empryo gets nonrishment and oxygen from the mother's blood through placenta.   1

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

c) Oviduct/ fallopian tube lining of the uterus   ½ + ½

OR

a. Hibiscus or any bisexual flower   ½

b. Carpel / pistil   ½

c. Fig 8.8 pg 135 (four lables)   1, ½ x 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. (b)
38. (c)	39. (c)	40. (b)	41. (b)