THE VILLAGE
INTERNATIONAL SCHOOL
"We Nurture Dreams"

MODEL EXAMINATION 2

2024-2025

SCIENCE (086)

Class: X **Time: 3 hours**

Max. Marks: 80

General Instructions:

1. All questions would be compulsory. However, an internal choice of approximately 33% would be provided. 50% marks are to be allotted to competency-based questions.
2. Section A would have 16 simple/complex MCQs and 04 Assertion-Reasoning type questions carrying 1 mark each.
3. Section B would have 6 Short Answer (SA) type questions carrying 02 marks each.
4. Section C would have 7 Short Answer (SA) type questions carrying 03 marks each.
5. Section D would have 3 Long Answer (LA) type questions carrying 05 marks each.
6. Section E would have 3 source based/case based/passage based/integrated units of assessment (04 marks each) with sub-parts of the values of 1/2/3 marks.

SECTION – A

Questions 1 to 16 are multiple choice questions. Only one of the choices is correct. Select and write the correct choice as well as the answer to these questions.

1. $Zn + 2CH_3COOH \longrightarrow (CH_3COO)_2 Zn + H_2$

The above reaction is a

a) Decomposition reaction
b) Displacement reaction
c) Double displacement reaction
d) Combination reaction

2. The metals which are found in both free state as well as combined state are

a) Gold & Platinum
b) Platinum & Silver
c) Copper & Silver
d) Gold and Silver

3. Sodium carbonate is a basic salt because it is a salt of a

a. Strong acid and strong base
b. Weak acid and weak base
c. Strong acid and weak base
d. Weak acid and strong base

4. 'Plaster of Paris' is

a) $CaSO_4 . 2H_2O$
b) $CaSO_4 . ½H_2O$
c) $CaSO_4 . H_2O$
d) $CaSO_4 . 10H_2O$

5. Which compounds are formed when zinc reacts with silver nitrate?

a) $Zn(NO_3)_2 + Ag$

b) $ZnNO_3$+ Ag
c) $AgNO_3$ + Zn $(NO_3)_2$
d) Ag + Zn $(NO_3)_3$

6. A student writes two incomplete chemical reactions.

X - $P_4(s) + 5O_2$ ⟶
Y -2Mg(s) + O_2 (g) ⟶

Which option completes the reaction to form a balanced chemical equation?

a) X – P_5O_4(s), Y – MgO (s)
b) X – 4PO_{10}(s), Y–4MgO (s)
c) X – P_4O_{10}(s), Y – 2MgO(s)
d) X – 5P_4O_2(s), Y- Mg_2O_2(s)

7. Which of the following statement is true about exothermic reactions?

a) They absorb heat
b) They release heat
c) They occur at low temperatures
d) They require energy input

8. Which of the following statement is true about human heart?
(i) Right atrium receives oxygenated blood from lungs through pulmonary artery.
(ii) Left atrium transfers oxygenated blood to left ventricle which sends it to various parts of the body.
(iii) Right atrium receives deoxygenated blood through vena cava from upper and lower body.
(iv) Left atrium transfers oxygenated blood to aorta which sends it to different parts of the body.

a) Only i
b) i and iv
c) ii and iii
d) ii and iv

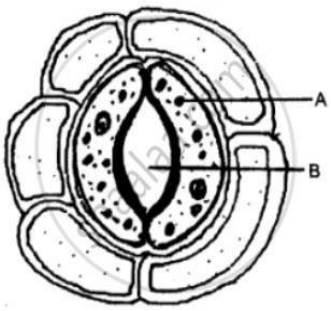
9. In human beings, when the process of digestion is completed, (i) proteins, (ii) carbohydrates, and (iii) fats are converted into

a) (i) Amino acids, (ii) glucose, (iii) fatty acids respectively
b) (i) Amino acids, (ii) glucose, (iii) fatty acids and glycerol respectively
c) (i) Glucose, (ii) fatty acids and glycerol, (iii) amino acids respectively
d) (i) Sugars, (ii) amino acids, (iii) fatty acids and glycerol respectively

10. As compared to terrestrial organisms, the rate of breathing in aquatic organisms is

a) Faster because they need more oxygen for their survival.
b) Faster because the amount of dissolved oxygen in water is fairly low.
c) Slower because the amount of dissolved oxygen in water is fairly low.
d) Slower because the capacity of water of dissolving atmospheric air is limited.

11. Which one of the following conditions is true for the state of stomata of a green leaf shown in the given diagram?



(GUARD CELL)

(STOMATAL PORE

a) Large amount of water flows into the guard cells.
b) Gaseous exchange is occurring in large amount.
c) Large amount of water flows out from the guard cells.
d) Large amount of sugar collects in the guard cells.

12. Which one of the following is not a function of artificial kidney?
a) To remove nitrogenous wastes from the blood
b) To remove excess fluids from the blood.
c) To reabsorb essential nutrients from the blood.
d) To filter and purify the blood.

13. A real image is formed by the light rays after reflection or refraction when they
(i) actually meet or intersect with each other
(ii) actually converge at a point
(iii) appear to meet when they are produced in the backward direction.
(iv) appear to diverge from a point

Which of the above statements are correct?
a) .(i) and (iv)
b) (ii) and (iv)
c) (i) and (ii)
d) (ii) and (iii)

14. If curvature of eye lens causes decrease in its focal length, then the refractive defect vision will be
a) myopia
b) hypermetropia
c) presbyopia
d) cataract

15. Consider the following statements about ozone:
(i) Ozone is a poisonous gas.
(ii) Ozone shields the earth's surface from the infrared radiation from the sun.
(iii) Ozone is a product of UV radiations acting on oxygen molecule.
(iv) At the lower level of the earth's atmosphere, ozone performs most essential function.

The correct statements are:
a) (i) and (ii)
b) (i) and (iii)
c) (ii) and (iii)
d) (ii) and (iv)

16. Some wastes are given below:

i. Garden waste
ii. Ball point pen refills
iii. Empty medicine bottles made of glass
iv. Peels of fruits and vegetables
v. Old cotton shirt

The non-biodegradable wastes among these are:

a) (i) and (ii)
b) (ii) and (iii)
c) (i), (iv) and (v)
d) (ii), (v) and (iii)

Question Nos. 17 to 20 consist of two statements – Assertion (A) and Reason (R). Answer these questions by selecting the appropriate option given below:

a) Both A and R are true, and R is the correct explanation of A.
b) Both A and R are true, and R is not the correct explanation of A.
c) A is true but R is false.
d) A is false but R is true

17. **Assertion (A):** Different metals have different reactivities with water and dilute acids.
Reason (R): Reactivity of a metal depends on its position in the reactivity series.

18. **Assertion (A):** The sex of a child is determined by the mother.
Reason (R): Humans have two types of sex chromosomes: XX and XY.

19. **Assertion (A):** It is not possible to see a virtual image by eye.
Reason (R): The rays that seem to emanate from a virtual image do not in fact emanate from the image.

20. **Assertion (A):** The waste we generate daily may be biodegradable or non-biodegradable.
Reason (R): The waste generated, if not disposed properly may cause serious environmental problems.

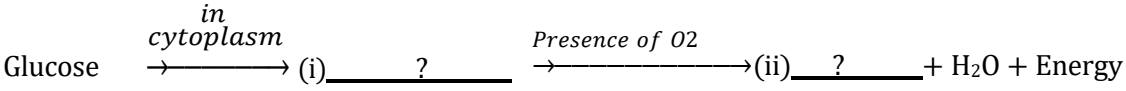
SECTION B

Question Nos. 21 to 26 are very short answer questions

21. When a solution of Potassium iodide is added to a solution of lead nitrate in a test tube, a reaction takes place.

(i) What type of reaction is this?
(ii) Write a balanced chemical equation to represent the above reaction.

22. Complete the following pathway showing the breakdown of glucose.



(6-carbon molecules)	(3-carbon molecules + energy	in mitochondria

23. A. Photosynthesis takes place in the leaves and the food prepared by it reaches other parts of the plants. Name the process involved and explain it.

OR

B. State one role of each of the following in human digestive system:

(i) Hydrochloric acid

(ii) Villi

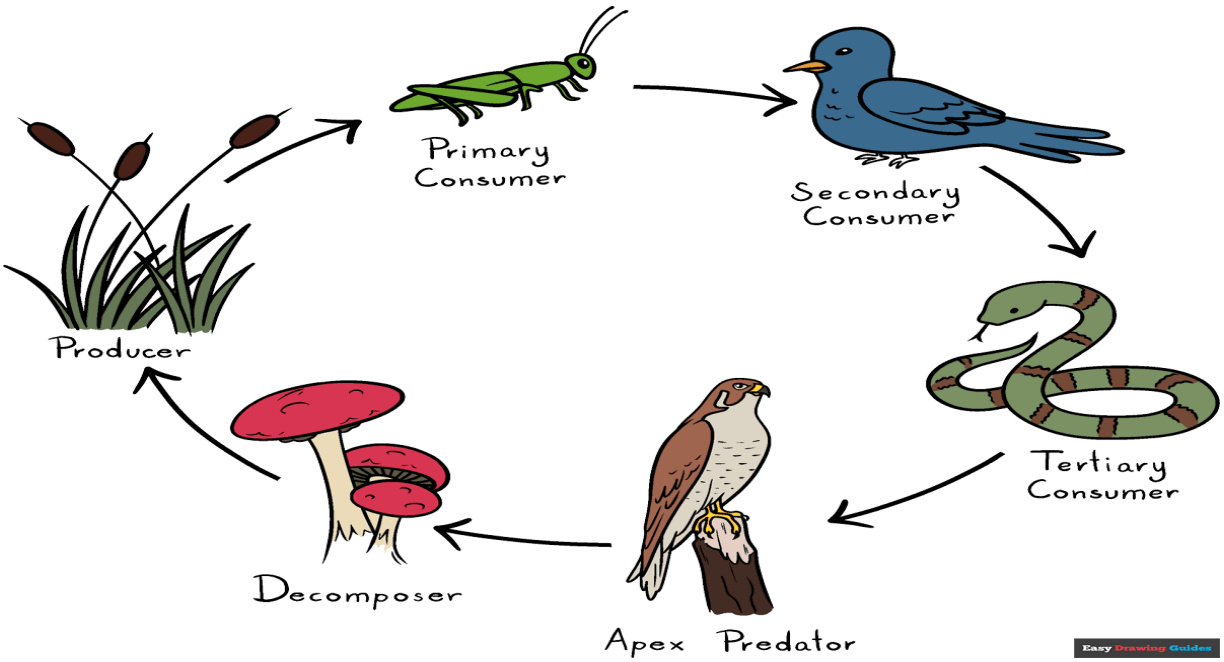
(iii) Anal Sphincter

(iv) Lipase.

24. Identify the mirror's nature and mention 2 image characteristics formed when the magnification is +6.

25. Why should a switch always be connected to the live wire?

26. What will be the amount of energy available to the organisms of the 2nd trophic level of given food chain, if the energy available at the first trophic level is 10,000 joules?



SECTION C

Question Nos. 27 to 33 are short answer questions

27. Suggest a method of reduction for the following metals during their metallurgical processes:

(i) Metal A which is one of the last, second or third position in the reactivity.

(ii) Metal B which gives vigorous reaction even with water and air.

(iii) Metal C which is kept in the middle of the reactivity series.

28. Write equations for

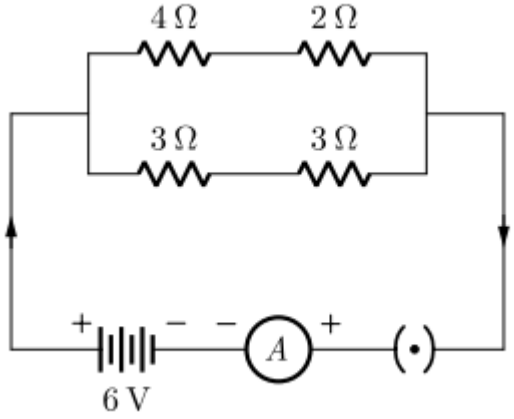
(i) Dissociation of HCl in water

(ii) Formation of hydronium ion
(iii) When NaOH is dissolved in water

29. List the events that take place during the process of photosynthesis in the proper sequence.

30. A cross was made between green-stemmed tomato plants denoted by (GG) and purple-stemmed tomato plants denoted as (gg) to obtain F_1 progeny.
(i) What colour of the stem would you expect in the F_1 progeny and why?
(ii) Give the percentage of purple-stemmed plants if F_1 plants are allowed to self-pollinate to produce F_2 progeny.
(iii) Write the ratio between GG and gg plants in the F_2 progeny.

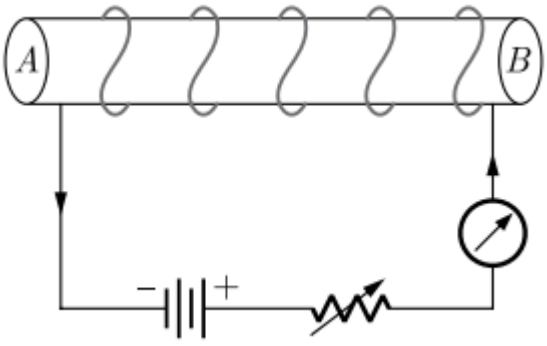
31. In the given circuit, find:



(i) Total resistance of the network of resistors
(ii) Current through ammeter A

32. Give reasons for the following.
(i) Tungsten is used almost exclusively for filament of electric lamp.
(ii) Copper and aluminum wires are used for transmission of electric current.

33. A student named Riya is conducting an experiment using a coil wound around a long, hollow cardboard tube connected to a battery to demonstrate the concept of electromagnetism. Copy the diagram.



(i) Show the polarity acquired by each face of the solenoid.
(ii) Draw the magnetic field lines of force inside the coil and also show their direction.
(iii) Mention two methods to increase the strength of the magnetic field inside the coil.

SECTION D

Question Nos. 34 to 36 are long answer questions.

34. A. Complete the following reactions:

(i) $C_2H_5OH + CH_3COOH \xrightarrow{Conc.H2SO4} \_\_\_\_\_ + H_2O$

(ii) $CH_4 + Cl_2 \xrightarrow{Sunlight} \_\_\_\_\_ + HCl$

(iii) $CH_3\text{-}CH_2\text{-}OH \xrightarrow[H_2SO_4]{Hot\ Conc} \_\_\_\_\_ + H_2O$

B. State two properties of carbon which lead to huge number of carbon compounds we see around us.

OR

Answer the following questions

A. Describe a chemical test to distinguish between ethanol and ethanoic acid.

B. Give reason for the following:

(i) Ethanol is used in the preparation of tincture iodine.

(ii) Ethanoic acid is used in the preservation of pickles.

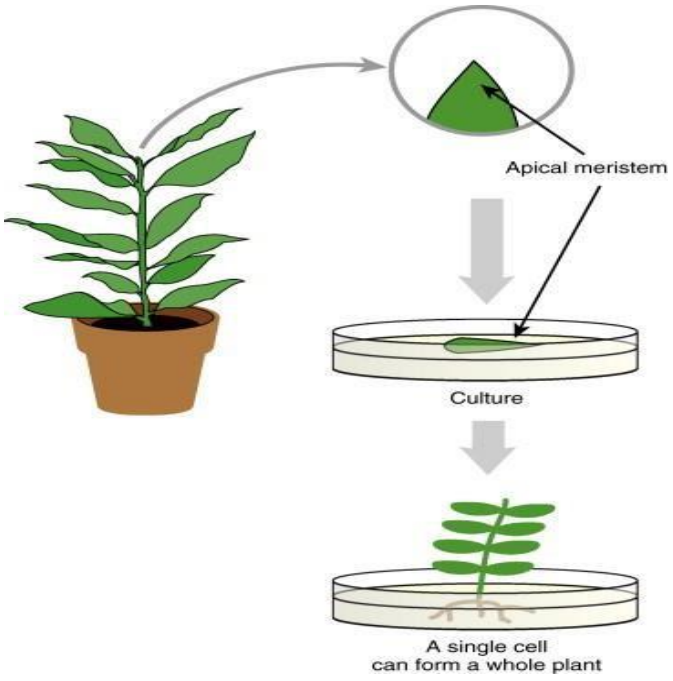
35. A. The image above shows that a scientist removed some cells from the growing point of a plant and placed it in a suitable medium leading to the formation of a shapeless lump of mass X. X is then transferred to another medium which stimulates it to develop roots. When X, which developed, roots is placed in yet another medium, it develops shoots to from tiny plantlets. These plantlets can then be transplanted in pots or soil where they can grow to form mature plants.

(i) What is the shapeless lump of mass X known as?

(ii) What name is given to this method of producing new plants?

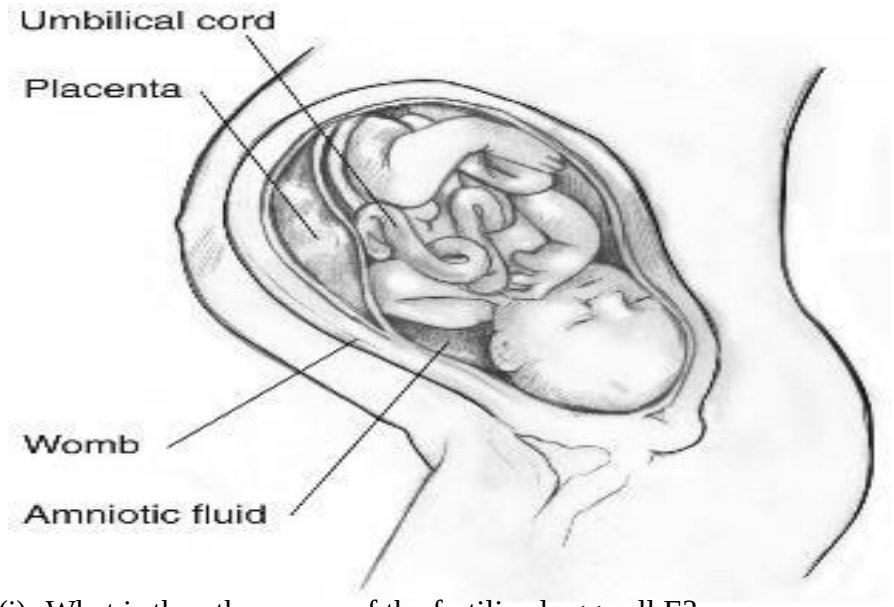
(iii) What is the general name of chemicals used to stimulate the growth of plant cells and development of roots and shoots?

(iv) State any two advantages of this method of producing plants.



OR

B. When a fertilised egg E is formed in the oviduct of a human female, it divides repeatedly to form an embryo. The embryo gets implanted in the thick and soft lining of the uterus. After this, a disc-like special tissue T develops between the uterus wall and embryo through which all the requirements of the developing embryo (and foetus) are met from the mother's body. The embryo is connected to the tissue T through a string like structure S.



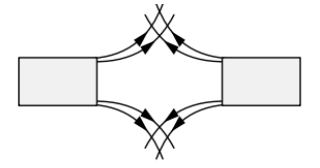
(i) What is the other name of the fertilized egg cell E?
(ii) What is the tissue T?
(iii) Name the string-like structure S.
(iv) Name two substances which pass from mother's blood to embryo through tissue T and, one type of substance which passes from embryo to mother's blood.

36. (i) State the rule to determine the direction of a

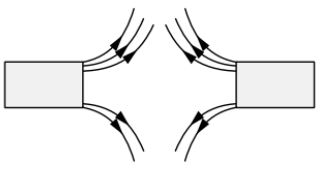
(a) magnetic field produced around a straight conductor-carrying current.

(b) force experienced by a current-carrying straight conductor placed in a magnetic field which is perpendicular to it, and

(ii) Magnetic field lines of two magnets are shown in fig. (a) and (b).



(a)



(b)

Select the figure that represent the correct pattern of field lines. Give reason for your answer.

SECTION E

Question Nos. 37 to 39 are case-based/data -based questions.

37. Hydrocarbons are the organic compounds of carbon and hydrogen, which are obtained from coal, petroleum and natural gas. Hydrocarbons and their derivatives may be saturated, unsaturated, cyclic and aromatic. Due to their large number, in order to correlate and have a systematic study of organic compounds, they have been further classified into a number of series or families known as homologous series.

(a) Out of ethane, ethanol and ethanoic acid, which has the lowest boiling point?
(b) What is the formula of cyclohexane?
(c) What is the general formula of ketone? Write the formula of ketone with four carbon atoms.

38. A.i. What type of plant movement is seen in the diagram of coiling of tendril given below?

ii. How does auxin promote the growth of a tendril around a support?

OR

B. The leaves of a touch me not plant begin to fold up and droop in response to a stimulus.

(i) Name the stimulus and write the cause for such a rapid movement.
(ii) Is there any growth involved in the movement? Define geotropism in plants.
(iii) What is meant by positive and negative geotropism? Give one example of each.

39. The relationship between the distance of object from the lens (u), distance of image from the lens (v) and the focal length (f) of the lens is called lens formula.
It is written as $\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$.

The size of the image formed by a lens depends on the position of the object from the lens. A lens of short focal length has more power whereas a lens of long focal length has less power. When the lens is convex, the power is positive and for concave lens, the power is negative. The magnification produced by a lens is the ratio of height of image to the height of object as the size of the image relative to the object is given by linear magnification (m). When, m is negative, image formed is real and when m is positive, image formed is virtual. If m < 1, size of image is smaller than the object. If m > 1, size of image is larger than the object.

(a) An object 4 cm in height is placed at a distance of 10 cm from a convex lens of focal length 20 cm. The position of image is
(i) -20 cm (ii) 20 cm (iii)-10 cm (iv)10 cm

(b) In the above question, the size of image is
(i) 16 cm (ii) 8 cm (iii) 4 cm (iv) 2 cm

(c) An object is placed 50 cm from a concave lens and produces a virtual image at a distance of 10 cm in front of the lens. The focal length is
(i) -25 cm (ii)-12.5 cm (iii) 12.5 cm (iv) 10 cm

(d) A convex lens forms an image of magnification -2 and height 6 cm. The height of the object is
(i) 6 cm (ii) 4 cm (iii) 3 cm (iv) 2 cm