Mid-Term Examination
GENERAL SCIENCE
MT-2024-10(B)

Time : 3 hrs. **M. Marks : 80**

General Instructions

i. This question paper consists of 39 questions in five sections.
ii. All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.
iii. Section A consists of 20 objective type questions carrying 1 mark each.
iv. Section B consists of 6 Very Short questions carrying 02 marks each. Answers to these questions should be in the range of 30 to 50 words.
v. Section C consists of 7 Short Answer type questions carrying 03 marks each. Answers to these questions should be in the range of 50 to 80 words.
vi. Section D consists of 3 Long Answer type questions carrying 05 marks each. Answer to these questions should be in the range of 80 to 120 words.
vii. Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.

SECTION - A

1. Fresh milk has a pH of 6. Name the chemical substance which is added to delay its curdling. (1)

(a) Sodium carbonate (b) Calcium carbonate
(c) Sodium chloride (d) Baking soda

2. Metal oxides generally react with acids, but few oxides of metal also react with bases. Such metallic oxides are :- (1)

I MgO
II ZnO
III Al_2O_3
IV CaO

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

3. A student, while burning a magnesium ribbon in air, collected the product in a wet watch glass. The new product obtained is :- (1)

(a) magnesium oxide
(b) magnesium carbonate
(c) magnesium hydroxide
(d) magnesium chloride

4. From the following select a decomposition reaction in which source of energy is light. (1)

(a) $2\ FeSO_4 \rightarrow Fe_2O_3 + SO_2 + SO_3$

(b) $2\ H_2O \rightarrow 2H_2 + O_2$

(c) $2\ AgBr \rightarrow 2Ag + Br_2$

(d) $CaCO_3 \rightarrow CaO + CO_2$

5. Generally metals react with acids to give salt and hydrogen gas. Which of the following acid does not give hydrogen gas on reacting with metals? (1)

(a) H_2SO_4 (b) HCl

(c) HNO_3 (d) All of these

6. When fats and oils are oxidized (1)

(a) they become rancid

(b) their smell changes

(c) their taste changes

(d) All of these

7. An element 'X' on exposure to moist air turns reddish brown and a new compound 'Y' is formed. The substance 'X' and 'Y' are (1)

(a) $X - Fe, Y - Fe_2O_3$ (b) $X - Ag, Y - Ag_2S$

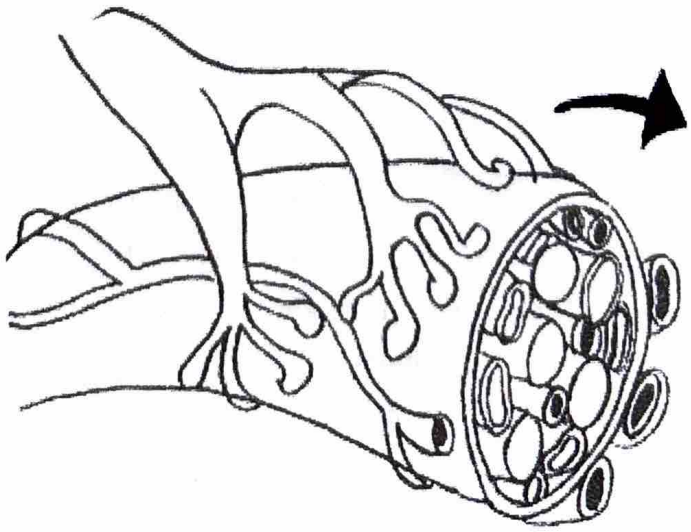
(c) $X - Cu, Y - CuO$ (d) $X - Al, X - Al_2O_3$

8. Which of the following is a voluntary action? (1)

(a) Salivation (b) Digestion

(c) Chewing. (d) Change in size of pupil

9. Observe the figure given below and select the correct option/event that does not occur at the given junction. (1)



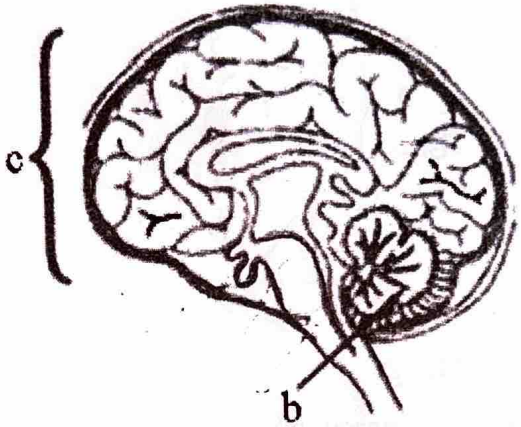
(a) information from our environment is detected by the specialised tips of nerve cells

(b) a nerve impulse reaches the muscle fibre

(c) delivery of nerve impulse from nerve cell to effector organ

(d) axonal end sets off release of chemicals

10. Observe the figure given below and select one option that correctly differentiates part (c) from (b) ? (1)



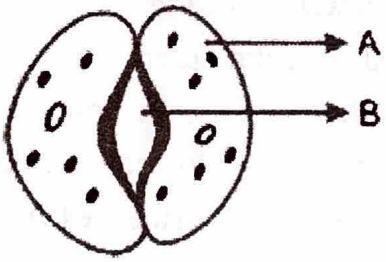
(a) b- it controls the movement of involuntary muscles, c- controls blood pressure

(b) c- it is the main thinking part of the brain, b- maintains the balance of the body

(c) b- has specialised areas for hearing, c- is a part of hind brain

(d) c- controls heart beat, b- is a part of mid brain

11. The parts shown as A and B in the given diagram are (1)



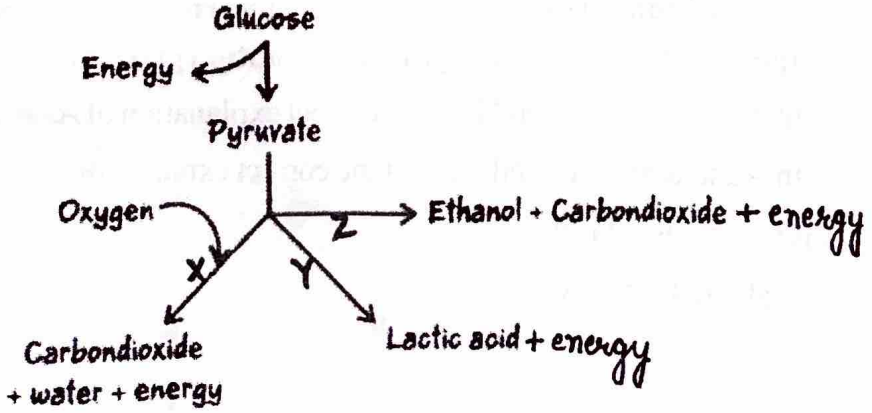
(a) A is epidermal cell, B is stomatal pore

(b) A is guard cell, B is stomatal pore

(c) A is epidermal cell, B is guard cell

(d) A is guard cells, B is epidermal cell

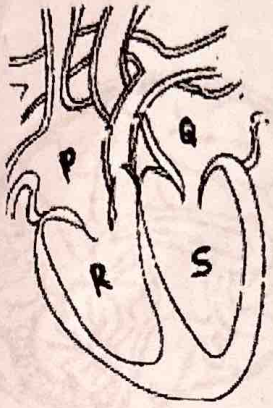
12. Which of the following occurs during oxygen shortage in muscle cells? (1)



(a) only X (b) only Y

(c) only Z (d) Y and Z

13. The figure shows a sectional view of human heart with labels P, Q, R, S. Select the option which gives the correct function or characteristic. (1)



(a) P – receives blood from lungs

(b) Q – has thick walls as compared to S

(c) R – first chamber to receive blood from body parts

(d) S – pumps blood to various organs in body

14. The sky appears dark to an astronaut flying at very high altitudes because (1)

(a) scattering of light is not enough at such heights

(b) the size of molecules is smaller than the wavelength of visible light.

(c) the light gets scattered towards the earth

(d) blue light gets absorbed in the atmosphere.

15. The focal length of a concave lens used to correct myopia is (1)

(a) less than the distance of far point from the eye to be corrected

(b) equal to the distance of far point from the eye to be corrected

(c) equal to 25cm.

(d) equal to 125 cm.

16. Which of the following properties of light do not change when a ray of light undergoes refraction (1)

(a) wavelength (b) frequency

(c) speed (d) both frequency and speed

Question No. 17 to 20 consist of two statements – Assertion (A) and Reason (R). Answer these questions 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) : In electrolysis of water, the volume of hydrogen liberated is twice the volume of oxygen formed. (1)

Reason (R) : Water (H_2O) has hydrogen and oxygen in the ratio of 1:2 by volume.

18. Assertion (A) : The emergent ray is parallel to the direction of the incident ray on passing through a rectangular glass slab . (1)

Reason (R) : The extent of bending of a ray of light at the opposite parallel faces (air glass interface and glass air interface) of the rectangular glass slab is equal and opposite.

19. Assertion (A) : In lungs, the blood brings carbon dioxide from the rest of the body for release into the alveoli. (1)

Reason (R) : Carbon dioxide is mostly transported in the dissolved form in our blood.

20. Assertion (A) : Lymph is similar to the plasma of blood but contains less proteins. (1)

Reason (R) : Lymph drains into larger lymph vessels that finally open into lymph capillaries.

SECTION - B

21. A stick held obliquely and partly immersed in water appears to be bent at the water air surface. Explain why does it appear to be bent. (2)

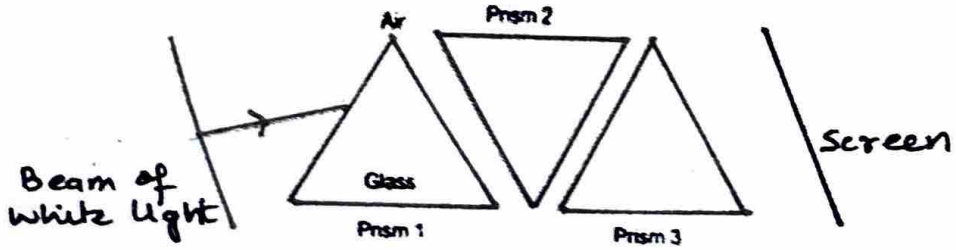
22. (a) What is the relation between colour of scattered light and size of the scattering particle. (2)

(b) The apparent position of an object when seen through the hot air fluctuates or wavers. State the basic cause of this observation.

23. Write an activity to find the rough focal length of a convex lens. (2)

OR

23. Complete the path of white light when it passes through three identical prisms placed as shown :



24. a) What constitutes the central and peripheral nervous systems? (2)

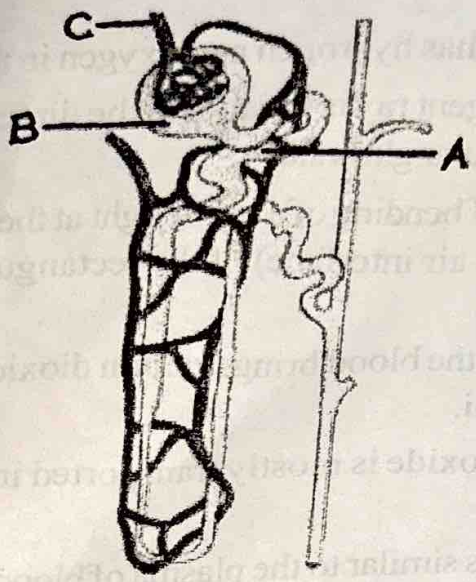
b) State one function of the peripheral nervous system?

OR

24. a) Name the part of the brain responsible for the following function

(i) Picking up a pencil (ii) Hunger (iii) Vomiting (iv) Sight

25. Observe the figure given below and answer the following questions (2)



i) Name the part 'B' and given one function of part 'B'.

ii) The structure in the figure shown above is located in organ 'X'. Give the location of 'X' in human body along with its two functions.

26. In one of the industrial processes used to manufacture sodium hydroxide, a gas 'X' is formed as a byproduct. The gas 'X' reacts with lime water to give a compound 'Y' used as a bleaching agent in the chemical industry. Identify 'X' and 'Y'. Give the chemical equation of the reactions involved. (2)

SECTION - C

27. Give the chemical formula of Plaster of Paris. How is it prepared? Give the common and chemical name of the compound formed when Plaster of Paris is mixed with water. (3)

28. Give reasons for the following : (3)

(i) Metals like sodium and potassium are stored under oil.

(ii) Magnesium starts floating on the surface when treated with water.

(iii) Tarnished copper vessels are cleaned with lemon or tamarind juice.

29. Draw a neat labelled diagram of human respiratory system. Name and label the following parts in diagram only: (3)

(a) voice box.

(b) skeletal structures surrounding chest cavity.

(c) balloon like structures for gaseous exchange.

(d) curved muscle that flattens when we breathe in.

(e) passage that has fine here for filteration of inhaled air.

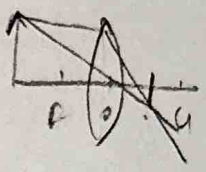
(f) common passage for air and food.

30. Tabulate three differences between Transport of materials in plants by xylem and Transport of materials in plants by phloem on the basis of (3)

i) Components of conducting tissues involved in transport of materials.

ii) Process involved in transportation.

ii) Direction of transport.



31. i) Draw a neat diagram for schematic representation of transport and exchange of oxygen and carbon dioxide. Name and label the following parts in the diagram. (3)

a) Blood vessels which carry blood away from heart to various body organs.

b) Blood vessels that carry blood to lungs.

c) Blood vessel that carries de-oxygenated blood from body organs to heart.

d) Blood vessels that carry oxygenated blood from lungs to heart.

ii) Define double circulation of blood in humans beings. Why is it necessary?

OR

31. i) Draw a neat diagram for schematic sectional view of the human heart. Name and label the following parts in the diagram

a) Blood vessels which carry blood away from heart to various body organs.

b) Blood vessels that carry blood to lungs.

c) Blood vessel that carries de-oxygenated blood from body organs to heart.

d) Blood vessels that carry oxygenated blood from lungs to heart.

ii) Name the fluid connective tissue in human body and its fluid medium.

32. (a) A convex lens of focal length 20 cm can produce a magnified virtual as well as real image. Where shall the object be placed in each case for obtaining these images? (3)

(b) If an object is placed at 10 cm from a convex mirror of radius of curvature 60 cm, then find the position of image.

33. (a) List two causes of hypermetropia. (3)

(b) Draw ray diagrams showing

(i) a hypermetropic eye and

(ii) its correction using suitable optical device.

SECTION - D

34. (a) Complete the following chemical equations : (5)

(i) $Al_2O_3 + HCl \rightarrow$

(ii) $Fe(s) + H_2O(g) \rightarrow$

(b) Give an example of a metal or a non metal

(i) most malleable and ductile metal.

(ii) lustrous non metal.

(iii) non metal that can exists in different forms.

OR

(i) Show the formation of sodium oxide by transfer of electrons.

(ii) Name the ions present in the above compound.

(iii) Give two important characteristics of the above compound.

(iv) What would happen if an iron nail is dipped in a solution of copper sulphate for some time. ?

35. (a) Define Power of a lens. Give its SI unit. (5)

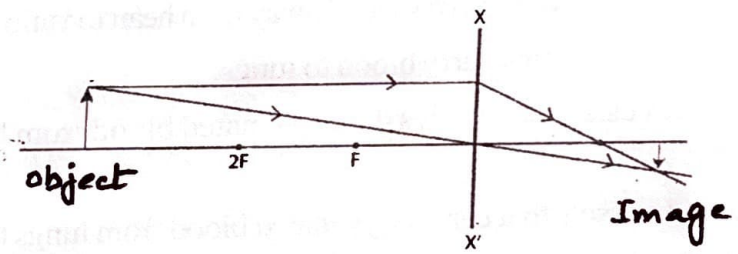
(b) Write the relationship among the object distance (u), image distance (v) and the focal length (f) of a

(i) Spherical lens

(ii) Spherical mirror

(c) Name the part of the lens through which a ray of light passes without undergoing any deviation.

(d) Identify the optical device used as XX'

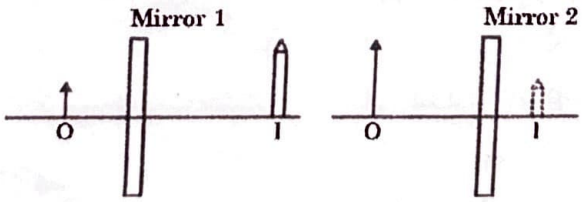


OR

35. (a) Define absolute refractive index. Give its mathematical expression.

(b) The refractive index of glass with respect to air is 3/2 and the refractive index of water with respect to air is 4/3. What will be the refractive index of glass with respect to water ?

(c) Study the following diagrams :

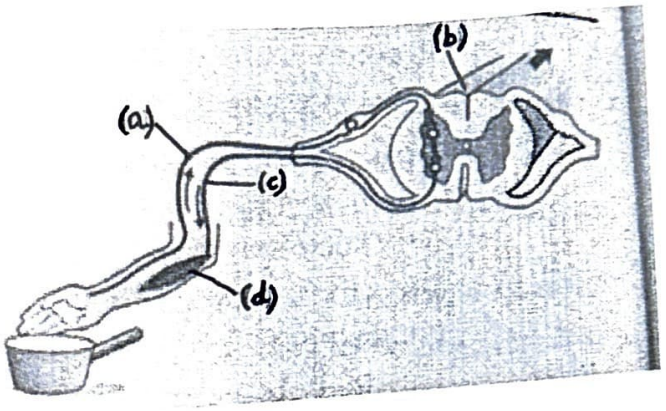


I = Image, O = Object

Identify Mirror 1 and Mirror 2 and state one use of each.

(c) A divergent lens has a focal length of 20 cm. At what distance should an object of height 4 cm be placed so that its image is formed 10 cm away from the lens.

38. The given figure depicts a pathway. Answer the questions on the basis of your understanding on the pathway.



a) Mention the name of the specific pathway shown and define it. (1)

b) Tabulate one difference between (a) and (c) on the basis of their function in the pathway. (1)

c) How does the part (d) respond on receiving the nerve impulse? (2)

OR

c) Nerves from all over the body meet in a bundle in part (b) on their way to the 'X'. Identify part (b) and 'X'. How are part (b) and 'X' protected?

39. Read the passage given below and answer the following questions ;

Copper sulphate crystals which seem to be dry contain water of crystallisation. When we heat the crystals, their water is removed and the salt turns white.

If you moisten the crystals again with water, you will find that blue colour of the crystals reappears.

(a) Give one example of anhydrous salt. (1)

(b) Define water of crystallisation? (1)

(c) How is washing soda prepared? Also give the chemical equation for the above process. (2)

OR

(c) (i) Name the sodium compound which is used for softening hard water.

(ii) Give the chemical formula of the compound which contains 7 molecules of water of crystallisation.

a) How is small intestine structurally designed to perform the function of absorption and transport of absorbed food to body cells? (5)

b) Give the specific location and name the secretions of gastric glands in human digestive system.

c) What is the basic difference between the process of respiration and photosynthesis on the basis of raw materials utilised?

OR

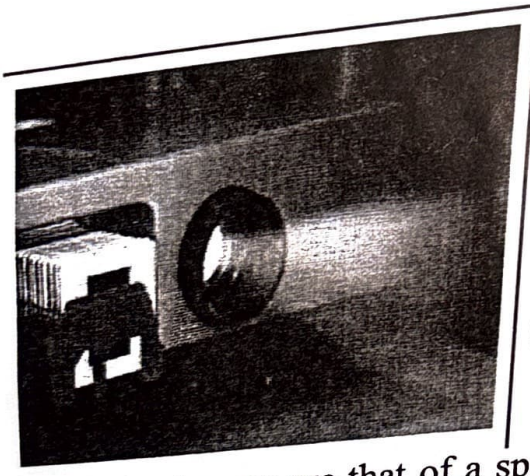
36. a) How is the absorbed food from small intestine utilised in human body?

b) Give the components of pancreatic juice and their specific function in the process of digestion. Also specify the medium in which they act.

c) What is the basic difference between the mode of obtaining nutrition by *Amoeba* and *Paramoecium?*

SECTION - E

37.



The above images are that of a specialized slide projector. Slides are small transparencies mounted in sturdy frames ideally suited to magnification and projection, since they have a very high resolution and a high image quality. There is a tray where the slides are to be put into a particular orientation so that the viewers can see the enlarged erect images of the transparent slides. This means that the slides will have to be inserted upside down in the projector tray. To show her students the images of insects that she investigated in the lab, Mrs. Iyer brought a slide projector. Her slide projector produced a 500 times enlarged and inverted image of a slide on a screen 10 m away.

(a) Based on the text and data given in the above paragraph, what kind of lens must the slide projector have? (1)

(b) If v is the symbol used for image distance and u for object distance then state with reason what will be the sign for v/u in the given case? (1)

(c) A slide projector has a lens with a focal length of 20 cm. The slide is placed 21 cm from the lens. How far away should the screen be placed from the slide projector's lens so that the slide is in focus? (2)

OR