A–5–Y

Roll No.

Total No. of Questions : 40] [Total No. of Printed Pages : 16

10th ARM(SZ)JKUT2024

1005–Y

SCIENCE

Time : 3 Hours] **[Maximum Marks : 80**

Section–A

1 each

Note :– Q. Nos. **1** to **18** are very short answer type questions of 1 mark each.

1. **If you are not able to read small letters in a dictionary, which of the following lenses would you prefer to use ?**

(A) A convex lens of focal length 50 cm

(B) A concave lens of focal length 50 cm

(C) A convex lens of focal length 5 cm

(D) A concave lens of focal length 5 cm

2. Which of the following statements is correct regarding the propagation of light of different colours of white light in air ?

(A) Red light moves fastest

(B) Blue light moves faster than green light

(C) Yellow light moves with the mean speed as that of the red and the violet light

(D) All the colours of the white light move with the same speed

3. The focal length of a concave lens is 100 cm. Calculate its power in dioptres :

(A) 1 D

(B) 0.5 D

(C) 2 D

(D) 0.2 D

4. Three resistors having resistances of 2 Ω, 4 Ω and 8 Ω are connected in parallel. Their equivalent resistance will be :

(A) 10 Ω

(B) 14 Ω

(C) 8/7 Ω

(D) Between 2 Ω and 8 Ω

5. To find out the direction of the deflection of the compass needle due to magnetic field of a current carrying conductor, we use :

(A) Ampere's swimming rule

(B) Fleming's right hand rule

(C) Fleming's left hand rule

(D) Maxwell's right hand rule

6. Which of the following phenomena occur, when a small amount of acid is added to water ?

(i) Ionisation

(ii) Neutralisation

(iii) Dilution

(iv) Salt formation

(A) (i) and (ii)

(B) (i) and (iii)

(C) (ii) and (iii)

(D) (ii) and (iv)

7. $4Na(s) + O_2(g) \rightarrow 2Na_2O(s)$

In the above reaction :

(A) Sodium gets reduced

(B) Sodium oxide gets reduced

(C) Sodium oxide gets oxidised

(D) Sodium gets oxidised

8. Which among the following compounds has 10 covalent bonds ?

(A) Ethane

(B) Propane

(C) Butane

(D) Pentane

9. Which of the following pairs will give displacement reactions ?

(A) NaCl solution and copper metal

(B) $MgCl_2$ solution and aluminium metal

(C) $FeSO_4$ solution and silver metal

(D) $AgNO_3$ solution and copper metal

10. The image formed by a concave mirror is observed to be virtual, erect and magnified. Where should be the position of the object ?

(A) Between the principal focus and the centre of curvature

(B) At the centre of curvature

(C) At infinity

(D) Between pole and principal focus

11. Aluminium is used for making cooking utensils. Which of the following properties of aluminium are responsible for the same ?

(i) Good thermal conductivity

(ii) Good electrical conductivity

(iii) Ductility

(iv) High melting point

(A) (i) and (ii)

(B) (i) and (iii)

(C) (ii) and (iii)

(D) (i) and (iv)

12. Which of the following is the correct sequence regarding sexual reproduction in a flowering plant ?

(A) Pollination, fertilization, seedling, embryo

(B) Seedling, embryo, fertilization, pollination

(C) Pollination, fertilization, embryo, seedling

(D) Embryo, seedling, pollination, fertilization

13. After fertilization which of the following parts develops into seed ?

(A) Ovary

(B) Ovule

(C) Pollen grain

(D) Stigma

14. In natural ecosystem, decomposers include :

(A) All microscopic organisms

(B) Bacteria and fungi

(C) Only bacteria

(D) Only fungi

15. Involuntary actions in the body are controlled by :

(A) Medulla in forebrain

(B) Medulla in midbrain

(C) Medulla in hindbrain

(D) Medulla in spinal cord

Note :– From Q. Nos. **16** to **18**, two statements (Assertion–A and Reason–R) are given. Select the correct answer to these questions from the codes A, B, C and D as given below :

Codes :

16 (A) A and R are true and R is the correct explanation of A.

(B) Both A and R are true but R is not the correct explanation of A.

(C) A is true but R is false. 17

(D) A is false but R is true.

16. **Assertion (A) :** When the direction of current in a current carrying straight conductor is upwards. the direction of magnetic field lines is clockwise.

Reason (R) : To find the direction of magnetic field lines, we use Maxwell's Right hand rule.

17. **Assertion (A) :** Vagina acts as copulation canal and fertilization canal.

Reason (R) : Both insemination and fusion of gametes occur in vagina.

18. **Assertion (A) :** Decomposers are micro-consumers.

Reason (R) : They bring mineralisation of decomposed matter.

Section–B

2 each

***Note* :–** There will be *ten* questions in this Section (Q. Nos. **19** to **28**) each of 2 marks.

19. Write the formula of cyclopentane and draw its electron dot structure.

20. Write the balanced chemical equation for the following chemical reactions :

(i) Barium chloride + Aluminium sulphate → Barium sulphate + Aluminium chloride

(ii) Zinc carbonate → Zinc oxide + Carbon dioxide

21. Draw the pattern of magnetic field lines around a current carrying solenoid.

22. Let the resistance of an electrical component remains constant while the potential difference across the two ends of the component decreases to half of its former value. What change will occur in the current through it ?

23. We cannot read a printed page by holding it very close to our eye. Why ?

24. What happens to the image distance in the eye when we increase the distance of an object from the eye ?

25. What would you observe when zinc is added to a solution of Iron (II) sulphate ? Write the chemical reaction that takes place.

26. How is the concentration of hydroxide ions affected when excess base is dissolved in a solution of sodium hydroxide ?

27. Under what soil conditions do you think a farmer would treat the soil of his fields with quick lime (calcium oxide) or slaked lime (calcium hydroxide) or chalk (calcium carbonate) ?

28. How does our body respond when adrenaline is secreted into the blood ?

Section–C

3 each

Note :– In this Section from Q. Nos. **29** to **37**, there will be *nine* questions with internal choice, each of 3 marks.

29. The potential difference between the terminals of an electric heater is 60 V when it draws a current of 4 A from the source. What current will the heater draw if the potential difference is increased to 120 V ?

Or

An electric iron of resistance 20 Ω takes a current of 5 A. Calculate the heat developed in 30 seconds.

30. Define Magnetic Field. List any *three* sources of magnetic field.

Or

What is an Electromagnet ? State any *two* points of difference between an electromagnet and a permanent magnet.

31. Differentiate between combination and decomposition reactions with the help of examples.

Or

What is a balanced chemical equation ? Why should chemical equations be balanced ?

32. Differentiate between minerals and ores with the help of examples.

Or

In an electrolytic refining of a metal M, what would you take as the anode, the cathode and the electrolyte ?

33. What would be the consequences of a deficiency of haemoglobin in our bodies ?

Or

Give the points of difference between autotrophic and heterotrophic nutrition.

34. Some diabetic patients are treated by giving insulin injections. Why ?

Or

Which animal or plant hormone is associated with the following ?

(i) Develop secondary sexual characters at puberty in boys.

(ii) Inhibits growth of plants

(iii) Goitre

35. Chances of fertilization are more if copulation has taken place during the middle of the menstrual cycle. Give reason.

Or

Give reasons for the following :

(i) Petals of flowers are variously coloured

(ii) Some plants are propagated only by vegetative methods.

36. Will geographical isolation be a major factor in the speciation of a self-pollinating plant species ? Why or why not ?

Or

Why are traits acquired during the life-time of an individual not inherited ?

37. How can you help in reducing the problem of waste disposal at local level ? Give any *two* methods.

Turn Over

Or

What are the problems caused by the non-biodegradable wastes that we generate ?

Section–D **5 each**

Note :– In this Section from Q. Nos. **38** to **40**, there will be *three* long answer type questions with internal choice, each of 5 marks.

38 Draw a ray diagram in each of the following cases to show the formation of image when the object is placed :

(i) Between centre of curvature and principal focus of a concave mirror

(ii) At the focus of a concave mirror

(iii) Between focus and pole of the concave mirror

Or

An object of size 7.0 cm is placed at 27 cm in front of a concave mirror of focal length 18 cm. At what distance from the mirror should a screen be placed, so that a sharp focused image can be obtained ? Find the size and the nature of the image.

30. Draw the structures for the following compounds :

(i) Bromopentane

(ii) Hexanal

(iii) Propene

(iv) 2, 3-dimethyl butane

(v) 2-Propanol

Or

Explain the following reactions with examples :

(i) Combustion reaction

(ii) Substitution reaction

40. Describe the structure and functioning of nephron.

Or

Describe transport of the following materials in plants :

(i) Water

(ii) Minerals

(iii) Food