

Roll No.....

Total No. of Questions : 40]

[Total No. of Printed Pages : 15

10thARFJD(S/Z) JKUT-2026

1305-B

SCIENCE

Time : 3 Hours]

[Maximum Marks : 80

SECTION-A

Note:- Q.No.'s 1 to 18 are very short answer type questions of 1 mark each.

1. When a fine beam of sunlight enters a smoke-filled room through a small hole, the path of the light beam becomes visible. It is caused due to:

(a) Atmospheric refraction (b) Dispersion of light
(c) Refraction of light (d) Tyndall effect
2. Which of the following has a relatively greater Refractive Index:

(a) Rock salt (b) Diamond
(c) Air (d) Ice

10thARFJD(S/Z) JKUT-26-1305-B

Turn Over

3. If the magnification produced by a spherical mirror is -2 , what does it tell about the image?

- ☒ (a) Image is real, inverted and twice the size of the object
- (b) Image is virtual, erect and half the size of the object
- (c) Image is real, upright and twice the size of the object
- (d) Image is virtual, inverted and twice the size of the object

4. The Boiling point of Sodium Chloride is:

- (a) 1074 K
- (b) 981 K
- ☒ (c) 1686 K
- (d) 1600 K

5. A positively-charged particle (alpha particle) projected towards west is deflected towards north by a magnetic field. The direction of magnetic field is:

- (a) towards south
- (b) towards east
- ☒ (c) downward
- (d) upward

6. Ammonium hydroxide is often used as a cleaner for windows and floors. What property of ammonium hydroxide makes it suitable for this use?
- (a) It is a strong acid that dissolves grease
 - ☒ (b) It is a strong base that can neutralize acids and dissolve dirt
 - (c) It leaves a sticky residue
 - (d) It corrodes metal quickly
7. The type of current which changes direction after equal intervals of time is called:
- ☒ (a) Alternating current (AC)
 - (b) Direct current (DC)
 - (c) Steady current
 - (d) Electrochemical current

8. When ethanoic acid reacts with sodium hydroxide, the main product produced is:

(a) Methanol

~~(b)~~ Ethanol

(c) Sodium carbonate

~~(d)~~ Sodium acetate

9. The reaction of calcium oxide with water to form calcium hydroxide is an example of:

~~(a)~~ Combination reaction

(b) Decomposition reaction

(c) Displacement reaction

(d) Double displacement reaction

10. An object is placed 15 cm in front of a concave mirror with a focal length of 10 cm. Where is the image located?
- (a) 5 cm behind the mirror
 - (b) 16 cm in front of the mirror
 - (c) 15 cm in front of the mirror
 - ☒ (d) None of the above
11. During electrolytic refining of copper, the insoluble impurities settle down:
- (a) at the bottom of the cathode
 - (b) at the bottom of the anode
 - (c) between anode and cathode
 - (d) anywhere in the solution

12. Bacteria commonly reproduce through binary fission. Which of the following statements is true about this process?
- (a) It involves two parent cells
 - (b) It creates genetically identical offsprings
 - (c) It requires complex cell division
 - (d) It generates offsprings with genetic variation.
13. Testosterone is a hormone in males primarily responsible for:
- (a) Regulating blood sugar level
 - (b) Fighting infections
 - (c) Helps in digestion
 - (d) Developing secondary sexual characters
14. In an ecosystem, energy transfer between trophic levels is inefficient. Approximately what percentage of energy is passed on from one level to the next?
- (a) 90%
 - (b) 50%
 - (c) 30%
 - (d) 10%

15. A gardener wants to make a plant branch out more by stimulating lateral bud growth. Which hormone would be most effective for this purpose?

- (a) Auxin
- (b) Gibberellin
- (c) Cytokinin
- (d) Abscissic acid

Note:- From Q No's 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 :

- (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.
- (d) A is false but R is true.

16. Assertion (A) : Electrical appliances with higher power ratings consume more energy when used for the same duration.

Reason (R) : Energy consumed by an appliance is proportional to the square of its voltage.

17. Assertion (A) : The stigma has no role during pollination.

Reason (R) : The stigma is sticky, which helps in capturing pollen grains.

18. Assertion (A) : Recycling materials like paper, glass and metals help conserve the environment.

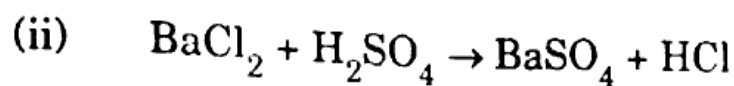
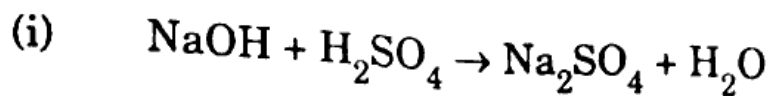
Reason (R): Recycling increases the need for raw materials and increases pollution.

SECTION-B

Note :- There will be Ten Questions in this Section (Q.No's 19 to 28) each of 2 marks.

19. Draw the structure of the first two members of the homologous series of carboxylic acids.

✓20. Balance the following chemical equations:



✓21. Draw the magnetic field pattern around a current carrying circular loop of wire.

✓22. A fan is connected to a 230 V mains supply. If the current drawn is 0.38 A, calculate the power consumed by the fan.

✓23. Make a diagram to show how myopia is corrected.

✓24. A person in a desert region notices that the sun appears to rise before the actual time of sunrise and sets after the actual time of sunset. What causes this apparent early sunrise and late sunset?

✓ 25. Give an example of a metal which

- (i) is a liquid at room temperature
- (ii) can be easily cut with a knife
- (iii) is the best conductor of heat
- (iv) is a poor conductor of heat

✓ 26. A milkman adds a very small amount of baking soda to fresh milk. Why does he shift the pH of the fresh milk from 6 to slightly alkaline?

✓ 27. Four solutions A, B, C and D when tested with universal indicator showed pH as 5, 2, 13 and 7, respectively. Which solution is:

- (i) Strongly alkaline
- (ii) Weakly acidic
- (iii) Neutral
- (iv) Strongly acidic

✓ 28. A person feels an increased heartbeat and nervousness before giving a public speech. Which hormone is responsible for this physical change in the body?

SECTION-C

Note :- In this section from Q.No's 29 to 37, there will be Nine Questions with internal choice, each of 3 marks.

✓ 29. Why are coils of electric toasters and electric irons made of an alloy rather than a pure metal?

OR

100 J of heat is produced each second in a 4Ω resistance. Find the potential difference across the resistor.

✓ 30. State the rule to determine the direction of a force experienced by a current carrying straight conductor placed in a magnetic field which is perpendicular to it.

OR

What is the function of an Earth wire? Why is it necessary to earth metallic appliances?

✓ 31. Why do copper objects develop a greenish layer when exposed to moist air for a long time? Write a balanced chemical equation for the reaction.

[12]

OR

Why is baking soda used in baking? Write the chemical equation for its decomposition.

- ✓ 32. What are amphoteric oxides? Give two examples of amphoteric oxides.

OR

Differentiate between roasting and calcination with examples.

33. Draw a labeled diagram of human excretory system.

OR

Make a diagram of human alimentary canal and label it.

- ✓ 34. How do auxins promote the growth of a tendril around a support? <https://www.jkboseonline.com>

OR

How are involuntary actions and reflex actions different from each other?

✓ 35.

DNA copying is an essential part of the process of reproduction. Why?

OR

What are the advantages of sexual reproduction over asexual reproduction?

✓ 36.

A pure tall pea plant (TT) is crossed with a pure short pea plant (tt). What will be the phenotypic and genotypic ratios of the F_2 generation? Show the cross.

OR

How is the sex of a child determined in humans?

37. A factory dumps untreated waste into a nearby river, affecting aquatic life and the local population. Suggest measures to prevent such pollution.



OR

An NGO launches a campaign to reduce the use of chemical fertilizers and promote organic farming. How can farmers be encouraged to adopt organic farming?

SECTION-D

Note :- In this section from Q.No's 38 to 40, there are Three Long answer type questions with internal choice each of 5 marks.

✓ 38. Draw a ray diagram to show the image formation by a convex lens when:

- (i) The object is placed at F_1 .
- (ii) The object is placed between F_1 and $2 F_1$.
- (iii) The object is placed at $2 F_1$.

What will be the position, nature and size of the image in each case?

Or

An object 5.0 cm in length is placed at a distance of 20 cm in front of a convex mirror of radius of curvature 30 cm. Find the position of the image, its nature and size.

✓ 39. What are hydrocarbons? With the help of suitable examples, explain alkanes, alkenes and alkynes.

OR

What are Soaps? Explain the mechanism of the cleansing action of Soaps.

40. What is heterotrophic nutrition? Describe the different types of heterotrophic nutrition with examples.

OR

Explain the role of xylem and phloem in transportation. How does transpiration help in the upward movement of water?

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1305-A

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SECTION-A

Note:- Q.No.'s 1 to 18 are very short answer type questions of 1 mark each.

1. A person has difficulty reading close objects but can see distant objects clearly. His near point is 50 cm. What focal length of the lens would be suitable to help him read at 25 cm?

(a) + 25 cm	(b) + 50 cm
(c) + 100 cm	(d) + 75 cm

2. In Which of the following medium, the speed of light is the fastest?

(a) Glass	(b) Water
(c) Air	(d) Vacuum

3. Which of the following describes the correct application of a concave lens?
 - (a) To correct hypermetropia
 - (b) To converge light rays for a spot-light
 - (c) To produce a virtual, erect image for a peephole in doors
 - (d) To magnify small objects

4. Which of the following converts electrical energy into mechanical energy?
 - (a) Electric Motor ✓
 - (b) Generator
 - (c) Electric Circuit
 - (d) Resistors

5. At the time of short circuit, the current in the circuit:
 - (a) Reduces substantially
 - (b) Does not change
 - (c) Increases heavily ✓
 - (d) Vary continuously

6. If a few drops of phenolphthalein are added to a solution and it turns pink, what does it indicate about the solution?
- (a) The solution is acidic
 - (b) The solution is basic
 - (c) The solution is neutral
 - (d) The solution is saturated
7. Which among the following has higher melting point?
- (a) NaCl
 - (b) CaCl_2
 - (c) CaO
 - (d) MgCl_2
8. What are the primary products of complete combustion of ethanol?
- (a) Water and carbon monoxide
 - (b) Water and carbon dioxide
 - (c) Methane and water
 - (d) Carbon and oxygen

9. Oiling or painting is a common method to prevent rusting of iron, because :
- (a) It increases the reactivity of iron
 - (b) It changes iron's chemical properties
 - (c) It forms a barrier between iron and moisture/oxygen
 - (d) It enhances the rate of oxidation
10. A convex lens has a focal length of 15 cm. Where should an object be placed to get an image of the same size as the object?
- (a) At 15 cm
 - (b) At 30 cm
 - (c) At 45 cm
 - (d) At 60 cm
11. Which of the following non-metals is a liquid?
- (a) Bromine
 - (b) Sulphur
 - (c) Carbon
 - (d) Phosphorus

12. In the human female reproductive system, the fertilization of the egg typically occurs in the:
- (a) Uterus (b) Ovaries
- (c) Fallopian tube (d) Cervix
13. Vegetative propagation in plants is primarily used for:
- (a) Producing Seeds
- (b) Sexual reproduction
- (c) Growing genetically identical offsprings
- (d) Pollination
14. Pesticides used in agriculture can harm top consumers in a food chain due to:
- (a) Biomagnification (b) Photosynthesis
- (c) Decomposition (d) Nitrogen fixation

15. While walking on a narrow ledge, Rohan finds it challenging to balance. Which part of his brain is mainly responsible for coordinating this balance?

- (a) Cerebrum
- (b) Hypothalamus
- (c) Medulla oblongata
- (d) Cerebellum

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16. Assertion (A) : In a series circuit, the voltage across each resistor is different if the resistors have different values.

Reason (R) : The same current flows through all resistors in a series circuit.

17. Assertion (A) : Amoeba reproduces through binary fission.

Reason (R) : Binary fission is a process where the organism splits into multiple daughter cells.

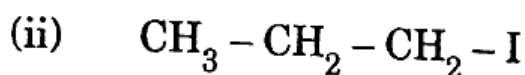
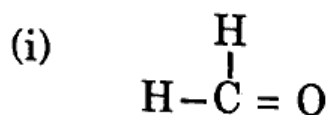
18. Assertion (A) : Pesticides can lead to biological magnification in a food chain.

Reason (R): Pesticides accumulate in the bodies of organisms and increase in concentration at higher trophic levels.

SECTION-B

Note :- There will be Ten Questions in this Section (Q.No's 19 to 28)
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19. Name the following compounds:



20. Why does the colour of copper sulphate solution change when iron nail is dipped in it?

21. Draw the magnetic field pattern around a current carrying circular loop of wire.

22. Calculate the amount of work done in moving a charge of 2C across two points having a potential difference of 12V?

23. Make a diagram to show how myopia is corrected.

24. A person in a desert region notices that the sun appears to rise before the actual time of sunrise and sets after the actual time of sunset. What causes this apparent early sunrise and late sunset?
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