

**E-5-A**

Roll No. ....

Total No. of Questions : **36** ]

[ Total No. of Printed Pages : **16**

**XKDAR21**

**5505-A**

**SCIENCE**

**Time : 3 Hours ]**

**[ Maximum Marks : 80**

***General Instructions :***

- (a) The question paper has four Sections A, B, C and D. There are Thirty Six questions in the question paper and all questions are compulsory.
- (b) Section-A (Q. 1 to Q. 20) all questions and parts thereof are of 1 mark each. These questions contain multiple choice questions, very short answer questions and assertion-reason type questions. Answer to these should be given in one word or one sentence.
- (c) Section-B (Q. 21 to Q. 26) are short answer type questions, carrying 2 marks each.

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- (d) Section-C (Q. 27 to Q. 33) carrying 3 marks each.
- (e) Section-D (Q. 34 to 36) are long answer type questions, carrying 5 marks each.
- (f) There is no overall choice. However internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.
- (g) Wherever necessary, neat and properly labelled diagrams should be drawn.

### Section-A

- 1. The image formed by a concave mirror is virtual, erect and larger than the size of the object. What is the position of an object and where the image is formed ?
- 2. Define principal axis of a spherical mirror.
- 3. When light goes from one transparent medium to another, the direction of propagation of light changes. This phenomenon is called refraction of light. What is the cause of this phenomenon ?

*Or*

Convex lens is also called a converging lens. Why ?

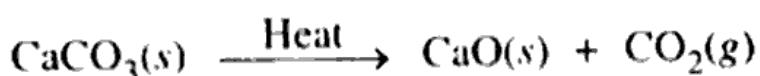
4. Formation of rainbow is an example of :

- (A) Atmospheric refraction
- (B) Scattering of light
- (C) Dispersion of light
- (D) Both (A) and (B)

(5.) Give the quantitative definition of electric current.

6. Write a balanced chemical equation for a reaction involving the displacement of hydrogen from sulphuric acid by zinc to form zinc sulphate and hydrogen gas.

7. When calcium carbonate is heated, it gives calcium oxide and carbon dioxide :



This reaction is an example of :

- (A) Combination reaction
- (B) Decomposition reaction
- (C) Displacement reaction
- (D) Double displacement reaction

8. Homologous series is a family of organic compounds having the same functional group and their adjacent members differ by a  $\text{CH}_2$  unit. Give the formulae of first three homologues of carboxylic acids.

*Or*

Soap molecules consist of two parts having different properties.

Name the part of the soap molecule that is hydrophilic.

9. During electrolytic refining of zinc, it gets :

- (A) Deposited on cathode
- (B) Deposited on anode
- (C) Deposited on both cathode and anode
- (D) Remains in the solution

10. Metals obtained by electrolytic reduction are :

- (A) Low in the activity series
- (B) In the middle of the activity series
- (C) Towards the top of the activity series
- (D) Both (A) and (B)

11. Name any two biodegradable pollutants.

12. Name the plant hormone that inhibits plant growth.

13. Name the substance which on treatment with chlorine yields bleaching powder.

From question numbers 14 to 16, two statements (Assertion-A and Reason-R) are given. Select the correct answer to these questions from codes a, b, c and d as given below :

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

14. Assertion (A) : If any food item containing oil or fat is left for a long time, it develops a bad taste and bad smell.

Reason (R) : Food item goes under decomposition to produce gases, that result the bad smell.

15. Assertion (A) : Without variations, evolution is impossible.

Reason (R) : Only useful variations are transmitted to the next generation.

16. Assertion (A) : Autotrops are also called as transducers.

Reason (R) : They change one form of energy into another.

17. Read the following and answer any *four* questions :

(1x4=4)

During kicking wire experiment when a current carrying conductor is placed in a magnetic field, it experiences a force. The force acting on a current carrying conductor is due to the interaction between magnetic field due to the current carrying conductor and external magnetic field in which the conductor is placed.

(i) The current carrying conductor in a magnetic field experiences force only :

- (A) When it is placed parallel to the magnetic field
- ✓(B) When it is placed in a direction perpendicular to the direction of magnetic field
- (C) When it is placed outside the magnetic field
- (D) None of these

(ii) The force acting on a conductor placed in a magnetic field is proportional to the :

- (A) Current flowing through the conductor
- (B) Length of the conductor inside the magnetic field
- (C) Magnitude of the magnetic field
- ✓(D) All of these

(iii) In kicking wire experiment, the current, the magnetic field and the direction of the force on the wire are :

- (A) Parallel to each other
- (B) Mutually at right angles to each other
- (C) Have no particular direction
- (D) None of these

(iv) The direction of force on the current carrying conductor in a magnetic field is given by : <https://www.jkboseonline.com>

- (A) Maxwell's right hand thumb rule
- (B) Fleming's right hand rule
- (C) Fleming's left hand rule
- (D) Ampere's swimming rule

(v) Which among the following works on the principle of kicking wire experiment ?

- (A) Electric motor
- (B) AC generator
- (C) DC generator
- (D) All of these

18. Read the following and answer any *four* questions : (1×4=4)

Atomic size is usually defined as the distance between the centre of the nucleus and the outermost shell which contains electrons. Atomic size shows gradual change when we move along the period or down the group in a periodic table.

(i) On moving from left to right in a period of the periodic table, atomic number of elements increases. With the increase in atomic number along the period, atomic size :

(A) Increases

✓(B) Decreases

(C) First increases then decreases

(D) Remains same

(ii) On moving down the group, atomic size :

✓(A) Increases

(B) Decreases

(C) Remains same

(D) None of these

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(iii) Which property/properties among the following show(s) regular variation on moving down the group or along a period ?

- (A) Atomic size
- (B) Valency
- (C) Metallic character
- (D) All of these

(iv) Which element among the following has the highest atomic radius ?

- (A) Na
- (B) Mg
- (C) K
- (D) Ca

(v) Which among the following gives the correct increasing order of the atomic radii of O, F and N ?

- (A) O, F, N
- (B) N, F, O
- (C) O, N, F
- (D) F, O, N

Turn Over

19. Read the following and answer any *four* questions : (1x4=4)

When an acid and a base react quantitatively with each other, they form salt. Salts have different properties than acids and bases.

(i) Reaction between an acid and a base to form a salt is called :

(A) Saponification

(B) Neutralization

(C) Sublimation

(D) None of these

(ii) The salt derived from a strong acid and a strong base forms a solution having a pH value :

(A) More than 7

(B) Less than 7

(C) Equal to 7

(D) Between 7 and 14

(iii) Which among the following is an example of a salt ?

(A) Sulphuric acid

(B) Less than 7

(C) Equal to 7

(D) Between 7 and 14

(iv) Which salt among the following is used in fire extinguisher ?

- (A) Sodium carbonate
- (B) Sodium bicarbonate
- (C) Calcium carbonate
- (D) None of these

(v) The solution of a salt is having the pH value less than 7. The salt has been derived from :

- (A) A weak acid and a weak base
- (B) A strong acid and a strong base
- (C) A weak acid and a strong base
- (D) A strong acid and a weak base

Q. Read the following and answer any *four* questions : (1x4=4)

Natural resources form the very basis of entire life on this planet. Continuous increase in human population and unending desire of man has resulted into increasing demand for natural resources.

(i) Which among the following is the most rapidly dwindling

**natural resource ?**

(A) Forests

(B) Water

(C) Sunlight

(D) Wind

(ii) Which statement(s) from the following correctly describe the concept of sustainable development ?

- I. Planned growth with minimum damage to the environment
- II. Growth irrespective of the extent of damage caused to the environment
- III. Stopping all developmental work to conserve the environment
- IV. Growth that is acceptable to all the stakeholders.

(A) II and III

(B) I and IV

(C) II and IV

(D) IV only

(iii) Which factor is mainly responsible for increase in demand of natural resources ?

- (A) Increased human population
- (B) Use of biodegradable chemicals
- (C) Environmental pollution
- (D) Scientific advancement

**(iv) Soil erosion can be prevented by :**

- (A) Overgrazing
- (B) Removal of vegetation
- (C) Afforestation
- (D) Deforestation

**(v) Deforestation generally decreases :**

- (A) Rainfall
- (B) Soil erosion
- (C) Drought
- (D) Global warming

### **Section-B**

21. Suggest any *two* practices to protect our environment.

*Or*

Waste management is a challenging task. State any *two* ways for the disposal of waste.

22. When we just enter in a dark room like cinema hall, it takes some time to see objects. Why ?

23. What is the function of placenta ?

Or

Name any *five modes of asexual reproduction.*

24. On passing through a glass prism white light splits into its seven constituent colours. What is this phenomenon called and how it is caused ?

25. Draw a circuit diagram of Ohm's law apparatus.

26. State the two vital functions of human kidney.

### Section-C

27. Give any *two points of difference between pollination and fertilization.*

Or

What is the advantage of sexual reproduction over asexual reproduction ?

28. Explain the cross between pure tall pea plant and pure dwarf pea plant through diagram.

29. Two resistors  $R_1$  and  $R_2$  are connected in series in a circuit having the resultant resistance of 6 Ohms. If the value of resistance for the resistor  $R_2$  is 2 Ohms, calculate the value of resistance for the resistor  $R_1$ .

30. What are the advantages of hydel power plant over thermal power plant ?

31. When an iron nail is dipped in a copper sulphate solution, blue colour of copper sulphate solution, fades and changes into light green colour. The iron nail that remained suspended develops a brownish coating on its surface. Name the type of reaction that takes place and write down a balanced chemical equation for the said reaction.

32. Differentiate between roasting and calcination.

33. Define Hormones. Name the hormone secreted by thyroid gland and state its function.

### Section-D

34. Define Refraction. With the help of a ray diagram explain refraction of light through a glass slab.

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.

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35. Draw the structures for the following compounds :

- (i) 1-Butene
- (ii) 2-Iodopropane
- (iii) 2-Propanol
- (iv) Butanoic acid
- (v) 3-Pentanone

*Or*

Discuss briefly the physical and chemical properties of Ethanol.

36. Describe transport of water and food in plants.

*Or*

With the help of a labelled diagram, describe the alimentary canal of man.

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