

Series RST-DS2

Code No. **RSPL/2**

Roll No.

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Candidates must write the Code on the title page of the answer-book.

- Please check that this question paper contains **12** printed pages.
- Code number given on the right hand side of the question paper should be written on the title page of the answer-book by the candidate.
- Please check that this question paper contains **30** questions.
- **Please write down the Serial Number of the question before attempting it.**
- **15** minutes time has been allotted to read this question paper.

SCIENCE

Time allowed : 3 hours]

[Maximum Marks : 80

General Instructions :

- (i) The question paper comprises three sections – A, B and C. Attempt all the sections.
- (ii) All questions are compulsory.
- (iii) Internal choice is given in each section.
- (iv) All questions in Section–A are one-mark questions comprising MCQ, VSA type and assertion-reason type questions. They are to be answered in one word or in one sentence.
- (v) All questions in Section–B are three-mark, short-answer type questions. These are to be answered in about 50 - 60 words each.
- (vi) All questions in Section–C are five-mark, long-answer type questions. These are to be answered in about 80 - 90 words each.
- (vii) This question paper consists of a total of 30 questions.

SECTION - A

1. What is the role of two conducting stationary brushes in a simple electric motor? 1

OR

State Lenz's law.

2. What happens when barium hydroxide solution is mixed with ammonium chloride solution? Give balanced chemical equation. 1
3. **Answer question numbers 3(a) to 3(d) on the basis of your understanding of the following paragraph and the related studied concepts.**

Clean water organisms die as Yamuna river remains polluted as ever.

A Delhi University Research team has found out that seventeen species of unicellular micro-organisms, which indicate the purity of water, are missing in several stretches of the river in Delhi. Some of these microbes act as natural purifiers of the water. In the absence of natural purifiers, the government has to set up many more sewage treatment plants.



Courtesy: Hindustan Times

- 3(a) What is the major cause of pollution of the river, Yamuna? 1
- 3(b) Name the most common indicator of pollution of a water body by disease-causing microbes. 1
- 3(c) If the clean water organisms die, what are the possible impacts on the ecosystem of the river? Give two points. 1
- 3(d) Certain pollutants in the effluents from factories discharged into the river get biomagnified. What does it mean? 1

4. Question numbers 4(a) – 4(d) are based on the table given below, indicating the observations made by four students 'A', 'B', 'C' and 'D' for different compounds given to them. Study the table carefully and answer the questions that follow:

'A'	A change in green colour of crystals with a characteristic odour of burning sulphur.
'B'	A solution of this substance is used for white-washing walls.
'C'	A thin layer deposited on walls when slaked lime slowly reacts with CO_2 in air.
'D'	Vegetable matter decomposes into compost.

- 4(a) Identify and name the green crystal given to student 'A'. Also write the balanced chemical equation for his observation. 1
- 4(b) Which one of the following is given to the student 'B'? 1
- (i) Slaked lime (ii) Quick lime
- (iii) Lime water (iv) Calcium carbonate
- 4(c) The thin layer deposited on walls, as observed by student 'C' is of 1
- (i) Slaked lime (ii) Quick lime
- (iii) Lime water (iv) Limestone
- 4(d) Name the type of reaction that student 'D' observed in terms of heat. 1

5. The process of dissolving an acid or a base in water is

1

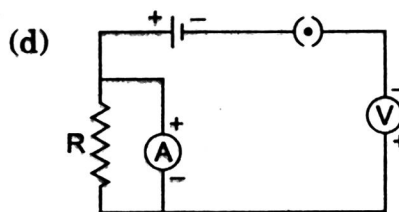
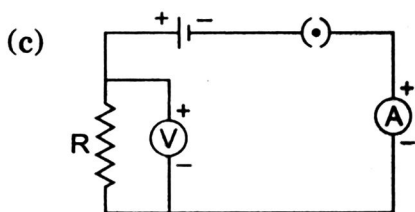
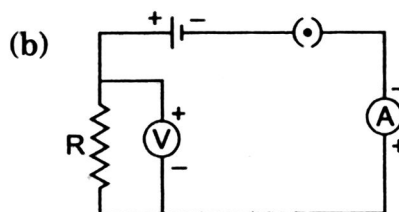
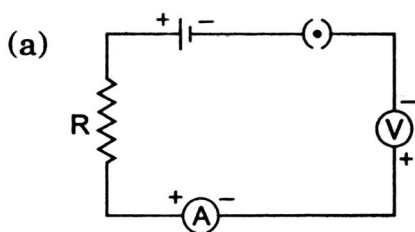
- (a) endothermic
- (b) double displacement
- (c) exothermic
- (d) neutralisation

OR

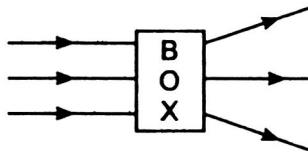
Mixing an acid or a base with water results in

- (a) increase in temperature and pressure of acid or base.
 - (b) decrease in temperature of acid.
 - (c) decrease in concentration of hydronium ions.
 - (d) None of these.
6. Given below are the figure showing various electrical components. Which one of the following circuits is properly connected?

1



7. A battery of 10 volt carries 20,000 C of charge through a resistance of 20Ω .
The work done in 10 seconds is 1
- (a) 2×10^3 joule
(b) 2×10^5 joule
(c) 2×10^4 joule
(d) 2×10^2 joule
8. The strength of magnetic field inside a long current carrying straight solenoid is 1
- (a) more at the ends than at the centre
(b) minimum in the middle
(c) same at all points
(d) found to increase from one end to the other
9. A beam of light is made to pass through the holes on one side of a box as shown in the figure: 1



The box contains which of the following substance?

- (a) Concave lens
(b) Glass prism
(c) A parallel-sided glass slab
(d) Convex lens

10. Some dinosaurs had feathers although they could not fly; but, birds have feathers that help them to fly. What does it indicate with reference to evolution? **1**

- (a) Reptiles have evolved from birds.
- (b) Feathers have developed superficially in reptiles, but from inside in birds.
- (c) There is no evolutionary relationship between birds and reptiles.
- (d) Birds have evolved from reptiles.

11. The function of sensory neurons is to carry impulses from **1**

- (a) central nervous system to receptors.
- (b) receptors to central nervous system.
- (c) spinal cord to brain.
- (d) central nervous system to effector muscles.

OR

The releasing hormones are the neuro-hormones secreted from

- (a) pituitary (b) thymus
- (c) hypothalamus (d) adrenals

12. The process in which the pollen grains from the anther land on the stigma of the same flower, is called **1**

- (a) syngamy (b) cross-pollination
- (c) fertilisation (d) self-pollination

Direction (Q.13 and Q.14): In the following Questions, the Assertion and Reason have been put forward. Read the statements carefully and choose the correct alternative from the following:

- (a) Both Assertion and Reason are correct and Reason is the correct explanation of the Assertion.
- (b) Assertion and Reason are correct but Reason is not the correct explanation of the Assertion.
- (c) Assertion is true but Reason is false.
- (d) The statement of the Assertion is false but Reason is true.

13. Assertion: The magnetic field inside a long straight solenoid carrying current is not zero.

Reason: It decreases as we move towards its ends.

1

14. Assertion: Shoot of a plant usually bends towards the source of light.

Reason: Shoot apex shows positive phototropism because of the differential growth caused by the auxin on the shaded side and the side facing light.

1

SECTION-B

15. (a) A stain of curry on a white cloth becomes reddish brown when soap is scrubbed on it? Why?

(b) When this cloth is washed with plenty of water, it again turns yellow. Why?

(c) Name any two natural indicators.

3

OR

- (a) Write names of any two synthetic indicators.
- (b) What do you mean by olfactory indicators? Give one example.
- (c) What happens when zinc is added to sodium hydroxide? Give balanced chemical equation.

16. Give reasons for the following:

- (a) Cryolite is added to the purified bauxite before it is electrolysed.
- (b) Aluminium is more reactive than iron, yet there is less corrosion of aluminium when both are exposed to air.
- (c) Iron is galvanized with zinc but not copper.

3

17. An organic compound 'X' on heating with conc. H_2SO_4 forms a compound 'Y' which on addition of one mole of H_2 in presence of Ni forms compound 'Z'. One mole of Z on combustion forms 2 moles of CO_2 and 3 moles of H_2O . Identify X, Y and Z and write the chemical equations of the reactions involved.

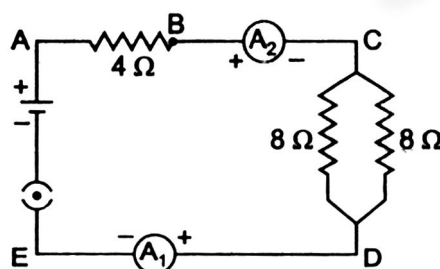
3

18. Write the functions of the following parts of human eye:

- (a) Aqueous humour
- (b) Retina
- (c) Ciliary muscles

3

19. Study the electric circuit given below and answer the following questions:



Calculate the following:

- (a) Effective resistance of two 8Ω resistors in the combination.
 - (b) Current flowing through 4Ω resistor.
 - (c) Potential difference across 4Ω resistor. **3**
- 20.** A student performed an experiment using concave lens of focal length 15 cm . The lens formed an image 10 cm from the lens. How far did he keep the object from the lens? Draw the ray diagram also. **3**
- 21.** How can you harness solar energy? Give and explain three methods. **3**

OR

Why have solar cells gained importance nowadays? Give three reasons.

- 22.** (a) Write two benefits obtained by an organism that is reproduced by forming spores.
- (b) Describe any two contraceptive methods (other than barrier method) available to human females and mention the side effects associated with each of them. **3**
- 23.** (a) Differentiate between inherited and acquired characters.
- (b) What are the two major sources of in-built tendency of variation during reproduction. **3**

OR

- (a) What is artificial selection? Give two examples of plants that are artificially selected.
- (b) Define genetic drift.

24. (a) Mention the functions of cerebellum.
- (b) How are involuntary actions different from reflex actions? 3

SECTION - C

25. (a) Explain with the help of a labelled diagram, the distribution of magnetic field due to a current through a circular loop.
- (b) Why does a current coil having 'n' turns, the field produced at any point is 'n' times as large as that produced by a single turn? 5

OR

Explain the principle and working of DC generator with the help of well-labelled diagram.

26. Give reasons for the following:
- (a) Colour of sky appears blue.
- (b) Stars appear twinkling.
- (c) Stars appear higher in sky.
- (d) Rainbow forms in the sky after rain.
- (e) A pool of water appears to be less deep than it actually is. 5
27. Consider the electrolysis of water. The two carbon electrodes are connected to a 6 V battery and are immersed in water. A few drops of acid are added to water. Two test tubes filled with water are kept inverted over the electrodes. Current is switched on and the apparatus is left undisturbed for some time.
- (a) What characteristic is observed for the reaction to take place?
- (b) Write the ratio of volumes of gases collected in each test tube.

(c) Which gas is present in each test tube?

(d) Give test for the identification of each gas.

(e) Give balanced chemical equation.

5

OR

(a) Give reasons for the following:

(i) Copper utensils and sheets become blackish after some days.

(ii) On passing hydrogen gas over the heated black material coating on the surface of copper sheets, the black colour changes to brown.

(iii) Colour of CuSO_4 solution changes on dipping iron nail in it.

(b) Name any two antioxidants which must be added to foods containing fats and oils.

(c) With which gas do the packets of chips flushed? Why?

28. Given below is the sequence of elements on the basis of their increasing atomic masses:



(a) Write any two pairs of elements having similar properties.

(b) Name the element which has inert gas configuration.

(c) Which law of classification of elements is represented by the given sequence?

(d) Write the number of valence electrons and valency in Ar.

(e) Give equations involved in formation of compound with Na and Cl.

5

29. (a) How do the following reproduce asexually?

Spirogyra, Yeast

- (b) Draw a diagram of the human female reproductive system and label four parts in it.
- (c) How does the amount of DNA remain constant though each new generation is a combination of DNA copies of two individuals/parents during sexual reproduction?

5

OR

- (a) Explain how is the sex of a human child determined genetically.
- (b) Differentiate between self-pollination and cross-pollination.

30. (a) Name the type of nutrition in plants and the process responsible for it.

- (b) Write down the three major events that occur during the above mentioned process.
- (c) Name two fungi that breakdown the food materials outside their body and then absorb it.

5