

Series RST-DS2

Code No. **RSPL/3**

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. Draw electron dot structure of acetic acid. 1
2. How will you distinguish a plane mirror, a concave mirror and a convex mirror without touching them? 1

OR

Define lateral magnification.

3. **Answer question numbers 3(a) to 3(d) on the basis of your understanding of the following paragraph and the related studied concepts.**

Under clear sky conditions, 4-7 kW solar energy falls on one km² area in a day. Our country has 250-300 sunny days in a year. Thus, India can harness energy of about 2 MW/km² per year through the use of solar technology. Geo Power India Pvt. Ltd. is a key player in the solar sector, headquartered in South Delhi. It plans to deliver renewable power which will lead the way for a clean, green, peaceful and maintainable energy solutions for the world.

- 3(a) Give two ways by which you, as an individual, can utilise solar energy. 1
- 3(b) Calculate the current that can be produced from 4-7 kW solar energy at domestic circuits. 1
- 3(c) Which one of the following devices cannot be made using solar energy? 1
 - (i) LED lights
 - (ii) DC air conditioners
 - (iii) Roof top solar plants
 - (iv) None of these.

(d) Which of the following sources of energy is solar energy?

1

(i) Conventional

(ii) Non-conventional

(iii) Both (i) and (ii)

(iv) None of these.

4. Question numbers 4 (a) – 4 (d) are based on the table given below. Study the table related to contraceptive methods and answer the questions that follow:

Table: A comparison of the contraceptive method used by the Indian population in the reproductive age in 2005-2006 and that in 2015-2016.

Sl. No.	Contraceptive method	2005-2006	2015-2016
1.	Traditional methods	7.8%	5.7%
2.	Male sterilisation	1.0%	0.3%
3.	Female sterilisation	37.4%	36.2%
4.	Condoms	5.2%	5.6%
5.	Intrauterine devices	1.7%	1.5%
6.	Oral pills	3.2%	4.2%

Source: NFHS, Ministry of Health and Family Welfare

Courtesy: Hindustan Times.

4(a) Mention one use of condom other than contraception.

1

4(b) How do oral pills act as contraceptives?

1

4(c) Name two contraceptive devices that are placed in the uterus.

1

4(d) Surgical removal of the foetus i.e. abortion is advised by qualified doctors in some cases, where the foetus is abnormal/suffering from an incurable disease; but it is misused. How?

1

5. For making a strong electromagnet, the material of core should be **1**
- (a) steel
 - (b) brass
 - (c) soft iron
 - (d) laminated steel strips
6. Concave mirror cannot be employed for which of the following: **1**
- (a) Headlight of car
 - (b) Make-up mirror
 - (c) Vigilance mirror
 - (d) Solar furnace
7. A student is performing an experiment in which he wants to obtain a real image twice the size of the object with a convex lens of focal length 15 cm. At what distance should he place the object? **1**
- (a) More than 15 cm but less than 30 cm.
 - (b) More than 5 cm but less than 10 cm.
 - (c) More than 10 cm but less than 15 cm.
 - (d) More than 30 cm but less than 60 cm.
8. Which of the following is not caused by the atmospheric refraction of light? **1**
- (a) Red appearance of sun at sunset.
 - (b) Twinkling of stars at night.
 - (c) Sun appearing higher in the sky than it actually is.
 - (d) Sun becoming visible two minutes before actual sunrise.

9. The slag obtained during extraction of copper pyrites is 1

- (a) CuSiO_3 (b) SiO_2
(c) FeSiO_3 (d) Cu_2S

10. In a cross conducted by Mendel between two pea plants, one with round, green (RRyy) seeds and another with wrinkled, yellow seeds, all the plants in the F_1 generation produced round, yellow seeds. When the F_1 plants were self-pollinated, the F_2 progeny consisted of some new combinations of characters along with the parental combinations. Select the new combinations of traits and choose the correct option. 1

- (i) Round, yellow seeds
(ii) Wrinkled, green seeds
(iii) Round, green seeds
(iv) Wrinkled, yellow seeds
- (a) (i) and (ii) (b) (i) and (iii)
(c) (ii) and (iii) (d) (ii) and (iv)

11. The part of the brain responsible for the precision of voluntary actions, is 1

- (a) cerebrum (b) midbrain
(c) cerebellum (d) medulla

12. Asexual reproduction is by budding in 1

- (a) *Amoeba* (b) *Leishmania*
(c) Yeast (d) *Plasmodium*

OR

The DNA copying mechanism cannot be absolutely accurate and the errors are a source of

- (a) mutation
- (b) variation
- (c) reproduction
- (d) All of these

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

13. Assertion: A solution of silver nitrate should not be placed in a copper vessel.

Reason: Copper is more reactive than silver and will dissolve silver to cause holes in the vessels.

1

OR

Assertion: A copper coin can be immersed in solution of silver nitrate for sometime.

Reason: Copper is more reactive than silver.

14. **Assertion:** Frogs mostly occupy the third trophic level in a food chain.

Reason: Frogs generally feed on the insects, which depend on plants for their food.

1

SECTION-B

15. (a) Hydrogen occupies a unique position in Modern Periodic Table. Justify.

(b) An element of group 15 has atomic number 15. Examine if this element will have metallic properties or not. Also give name of the element.

3

16. Define roasting and calcination. Explain giving chemical equations.

3

17. (a) Why does survival of aquatic life in river containing acidic water become difficult?

(b) Why is it advised to clean the mouth after eating food daily?

(c) Why do you take antacids on indigestion?

3

18. A solution of lead (II) nitrate is mixed with potassium iodide.

(a) Identify and write the name of the compound precipitated.

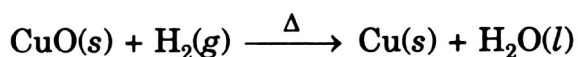
(b) Write the balanced chemical equation for the reaction.

(c) Identify the type of reaction taking place.

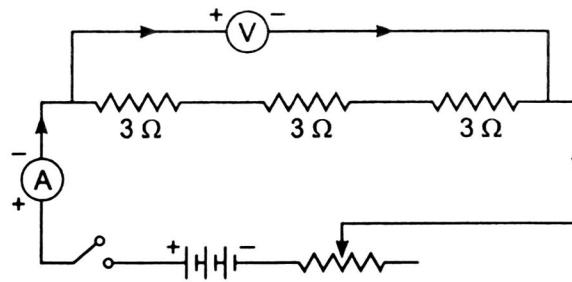
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OR

Identify the substances that are oxidised and reduced, oxidant and reductant in the following equation:



19.



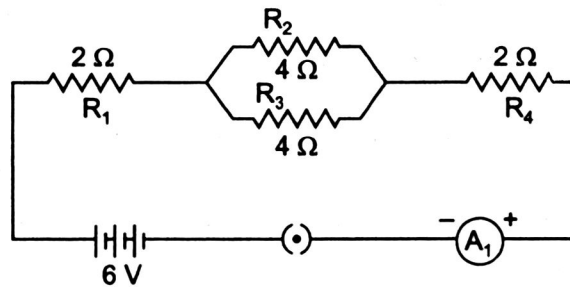
- Find effective resistance of circuit.
- What type of combination of 3 resistances has been shown in the circuit?
- For potential difference of 6 V, find the current flowing through the circuit.

3

OR

Calculate the current through each resistance in the circuit given below.

Also redraw the diagram and show the flow of current using arrows.



20. Write the expression for the electric power when:

- voltage and current are given.
- current and resistance are given.
- voltage and resistance are given.

3

21. Draw a well-labelled diagram to explain the sign conventions for the concave mirror. **3**

22. (a) Represent schematically the oxidation of glucose to get energy in our

(i) body cells under normal conditions.

(ii) muscle cells during strenuous exercise.

(b) Why do aquatic animals breathe faster than terrestrial animals? **3**

23. (a) What is meant by 'sustainable development'?

(b) Describe any two aspects that must be considered for the management of natural resources. **3**

OR

(a) If 5 J of energy is available to the fourth trophic level in a food chain, what would have been the amount of energy available to the producers from the sun?

(b) What are decomposers? State their importance in the ecosystems.

24. (a) What are fossils? How do they help in the study of evolution?

(b) How is the age of fossils calculated? **3**

SECTION-C

25. (a) How do we see the colours? Explain briefly.

(b) (i) What is colour blindness?

(ii) How is it caused?

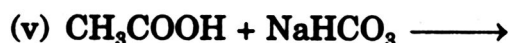
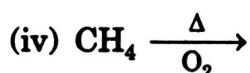
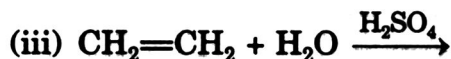
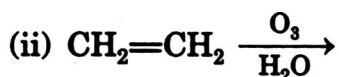
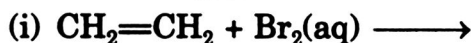
(c) Give another name for shortsightedness. **5**

OR

- (a) A person uses a lens of power -3.5 D for distant viewing. His doctor has prescribed a correction of $+0.5$ D in the near vision section of his bifocals. Calculate the focal length of
- his distant-viewing part of lens.
 - his near-vision viewing part of lens.
- (b) Draw a well-labelled diagram to show the refraction through rectangular glass slab.
- 26.** (a) How is the wiring of the household electric circuits done? Explain with the help of well-labelled diagram.
- (b) What safety precautions should be taken while using electricity? Write any two.

5

27. Complete the following reactions:



5

OR

A neutral organic compound 'P' of molecular formula $\text{C}_2\text{H}_6\text{O}$ gives an acidic compound Q on oxidation with $\text{K}_2\text{Cr}_2\text{O}_7$ and H_2SO_4 . P reacts with Q on warming in presence of conc. H_2SO_4 and gives a sweet-smelling substance R. Identify P, Q, R. Give equations of the reactions involved.

28. A student was given about 2 kg of lead nitrate powder in a boiling tube. He heated it over the flame. He observed emission of a brown coloured gas.

(a) Which gases were evolved? Name them.

(b) What type of reaction took place?

(c) Write the balanced chemical equation.

(d) How will you test the colourless gas that was evolved during the reaction? Explain.

(e) Name the product that was formed.

5

29. (a) Draw a diagram of the reproductive system of a human male and label

(i) Testis,

(ii) Scrotum,

(iii) Vas deferens

(iv) Prostate gland,

(v) Seminal vesicle and

(vi) Urethra

(b) Why does menstruation occur in a human female?

5

30. (a) Distinguish between voluntary and involuntary actions that occur in our body.

(b) What is hydrotropism?

(c) How does our body respond, when adrenaline is secreted into the blood? **5**

OR

- (a) Draw a diagram of human urinary system and label the following parts with their technical names:
- (i) Where urine is formed.
 - (ii) The tube that conducts the urine formed by the above organ.
 - (iii) Where urine is temporarily stored.
 - (iv) The passage of urine to the outside of the body.
- (b) Mention any four methods used by plants to get rid of their metabolic wastes.
- (c) What is the significance of the residual volume of air in the lungs?