5 ☐ CCE PR/NSR & NSPR(D)/900/7825

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ಸಂಕೇತ ಸಂಖ್ಯೆ : **83-E**

Code No. : 83-E

D

Question Paper Serial No. **900**

CCE PR
UNREVISED REDUCED SYLLABUS NSR & NSPR

ವಿಷಯ : ವಿಜ್ಞಾನ

Subject : SCIENCE

(ಭೌತ ವಿಜ್ಞಾನ, ರಸಾಯನ ವಿಜ್ಞಾನ ಮತ್ತು ಜೀವ ವಿಜ್ಞಾನ / Physics, Chemistry & Biology)

(ಇಂಗ್ಲಿಷ್ ಮಾಧ್ಯಮ / English Medium)

(ಪುನರಾವರ್ತಿತ ಖಾಸಗಿ ಅಭ್ಯರ್ಥಿ / ಎನ್.ಎಸ್.ಆರ್. & ಎನ್.ಎಸ್.ಪಿ.ಆರ್.)

(Private Repeater / NSR & NSPR)

ದಿನಾಂಕ : 10. 04. 2023] [Date : 10. 04. 2023

ಸಮಯ : ಬೆಳಗ್ಗೆ 10-30 ರಿಂದ ಮಧ್ಯಾಹ್ನ–1-45 ರವರೆಗೆ]

[Time : 10-30 A.M. to 1-45 P.M.

ಗರಿಷ್ಠ ಅಂಕಗಳು : 100] [Max. Marks : 100

General Instructions to the Candidate :

1. There are *three* parts in the question paper :
   Part A : Physics, Part B : Chemistry, Part C : Biology.
2. This question paper consists of objective and subjective types of 48 questions.
3. This question paper has been sealed by reverse jacket. You have to cut on the right side to open the paper at the time of commencement of the examination. Check whether all the pages of the question paper are intact.
4. Follow the instructions given against both the objective and subjective types of questions.
5. Figures in the right hand margin indicate maximum marks for the questions.
6. The maximum time to answer the paper is given at the top of the question paper. It includes 15 minutes for reading the question paper.

[Turn over

ಇಲ್ಲಿಂದ ಕತ್ತರಿಸಿ

TEAR HERE TO OPEN THE QUESTION PAPER
ಪ್ರಶ್ನೆಪತ್ರಿಕೆಯನ್ನು–ತೆರೆಯಲು ಇಲ್ಲಿ ಕತ್ತರಿಸಿ

Tear here

PART – A

(PHYSICS)

I. *Four* alternatives are given for each of the following questions / incomplete statements. Choose the correct alternative and write the complete answer along with its letter of alphabet. 4 × 1 = 4

1. The device used to measure the rate of the current in a circuit is

   (A) Ammeter (B) Voltmeter

   (C) Galvanometer (D) Battery

2. The focal Length of a lens is + 0·50 m. The power of the lens and type is

   (A) + 2·0 D and concave lens

   (B) + 2·0 D and convex lens

   (C) – 2·0 D and concave lens

   (D) – 2·0 D and convex lens

3. A light ray enters to rarer medium from a denser medium. Then the speed of that light ray

   (A) decreases and bends towards the normal

   (B) increases and bends away from the normal

   (C) decreases and bends away from the normal

   (D) increases and bends towards the normal

4. The inner wall of the solar cooker is painted black. Because black colour

(A) reflects light (B) converges solar rays

(C) prevents from rusting (D) absorbs more heat

II. Answer the following questions : 2 × 1 = 2

5. Write the symbols of the following components used in an electric circuit.

i) Rheostat

ii) Wires crossing without joining

6. What does the thumb indicate in the right hand thumb rule ?

III. Answer the following questions : 5 × 2 = 10

7. Light enters from air to benzene having refractive index 1·50. Calculate the speed of light in benzene.

(Speed of light in air is 3×10^8 ms^{-1})

OR

A concave lens has focal length of 12 cm. At what distance should the object from the lens be placed so that it forms an image at 9 cm from the lens ?

8. Name the major constituent of biogas and write the properties of biogas.

OR

List the hazards of nuclear power generation.

9. "Connecting electrical appliances in parallel is advantageous over connecting them in series" in a circuit. Justify.

10. Draw the diagram of a simple electric motor and label 'brushes'.

11. When an object is placed between F_1 and $2F_1$ of a concave lens, mention the position, size and nature of the image formed.
(F_1 : Principal focus of the lens)

IV. Answer the following questions : **3 × 3 = 9**

12. State Ohm's law. On which factors does the resistance of a conductor depend ? Mention the SI unit of electric power.

OR

State Joule's law of heating. How is fuse connected in the circuits ? Name the metal used in the filament and the gas filled in electric bulb.

13. The resistors R_1, R_2 and R_3 have the values 10 Ω, 20 Ω and 60 Ω respectively, which have been parallelly connected to a battery of 24 V in an electric circuit. Then calculate the following.

i) The current flowing through each resistor

ii) The total current in the circuit

iii) The total resistance of the circuit.

14. Draw the ray diagram for the image formation in a convex lens when the object is placed beyond $2F_1$. Mention the position and nature of the image formed.

[F_1 : Principal focus of the lens]

V. Answer the following question : 1 × 4 = 4

15. a) What is solenoid ? Write the properties of the magnetic field lines formed around a current carrying solenoid.

b) What is alternating current ? Electric appliances having metallic body are connected to earth wire. Why ?

VI. Answer the following question : 1 × 5 = 5

16. a) Define focal length, principal axis and aperture of the spherical lens.

b) State two laws of refraction of light.

PART – B

(CHEMISTRY)

VII. *Four* alternatives are given for each of the following questions / incomplete statements. Choose the correct alternative and write the complete answer along with its letter of alphabet. 2 × 1 = 2

17. A non-metallic oxide reacts with base and produces salt and water. Then the property of this non-metallic oxide is

(A) acidic (B) basic

(C) neutral (D) amphoteric

18. Among ${}_2X^4$, ${}_8Y^{16}$, ${}_{10}Z^{20}$; the elements having zero valency are

[2, 8, 10 are atomic numbers of elements]

(A) ${}_2X^4$ and ${}_8Y^{16}$ (B) ${}_8Y^{16}$ and ${}_{10}Z^{20}$

(C) ${}_2X^4$ and ${}_{10}Z^{20}$ (D) ${}_2X^4$, ${}_8Y^{16}$ and ${}_{10}Z^{20}$

VIII. Answer the following questions : 4 × 1 = 4

19. The general formula of cycloalkanes is C_nH_{2n} and its first member is cyclopropane (C_3H_6). Write the molecular formula and structural arrangement of the fourth member of this homologous series.

20. State Mendeleev's periodic law.

21. Potassium is kept immersed in kerosene. Why ?

22. How many electrons are shared to form hydrogen molecule ?

IX. Answer the following questions : **6 × 2 = 12**

23. Draw the diagram of arrangement of apparatus to show that acid solution in water conducts electricity and label dilute HCl solution.

24. Write the structural arrangement of isomers of butane.

25. Draw the diagram of arrangement of apparatus to show the action of steam on a metal.

26. What is malleability of metals ? Name a highly ductile metal and a liquid metal.

27. Carbon forms covalent compounds. Why ? Why do covalent compounds have low melting and boiling points ?

28. Explain the reason for applying baking soda on honeybee stung area.

X. Answer the following questions : **3 × 3 = 9**

29. a) Depict the formation of magnesium chloride with the help of electron dot structure.

b) Hydrogen gas is not liberated when a metal like zinc reacts with nitric acid. Why ?

OR

a) Why is aluminium oxide called an amphoteric oxide ?

b) Write the differences between the physical properties of metals and non-metals.

30. a) Observe the given part of the modern periodic table and answer the following questions :

Groups → / Periods ↓	1	2	13	17
2	—	Be	—	—
3	Na	Mg	Al	Cl
4	—	Ca	—	—

i) Which element is more electropositive ? Why ?

ii) Atoms of which element have minimum atomic radius ? Why ?

b) Mention the period and group number of the element that has atomic number 19.

31. Name the gases liberated in the following chemical reactions. Write balanced chemical equations for these reactions.

a) Zinc reacts with dilute sulphuric acid

b) Sodium hydrogen carbonate reacts with dilute hydrochloric acid.

OR

a) The pH values of four solutions are given in the below table. Classify these into acidic and basic solutions :

Solution	***pH Value***
e	5
f	13
g	9
h	2

b) Name the antacid used to neutralise excess of acid in the stomach.

XI. Answer the following question : **1 × 4 = 4**

32. a) What are functional groups ? Name the functional group present in propanal and write the structure of this compound.

b) Write the molecular formula and electron dot structure of ethane.

PART – C

(BIOLOGY)

XII. ***Four*** **alternatives are given for each of the following questions / incomplete statements. Choose the correct alternative and write the complete answer along with its letter of alphabet.** **2 × 1 = 2**

33. "A person immediately starts running soon after observing a snake." The correct transmission path of reflex impulse in this situation is

(A) Receptor → Sensory neuron → Brain → Relay neuron → Motor neuron → Effector

(B) Receptor → Sensory neuron → Spinal cord → Relay neuron → Motor neuron → Effector

(C) Effector → Spinal cord → Sensory neuron → Relay neuron → Motor neuron → Receptor

(D) Effector → Motor neuron → Relay neuron → Brain → Sensory neuron → Receptor

34. In humans, the testes are located outside the lower abdomen in the scrotum, because

(A) to protect testes from mechanical shocks

(B) to increase the production of sperms

(C) to maintain the secretion of testosterone hormone

(D) to maintain the temperature required for sperm production.

XIII. Answer the following questions : **2 × 1 = 2**

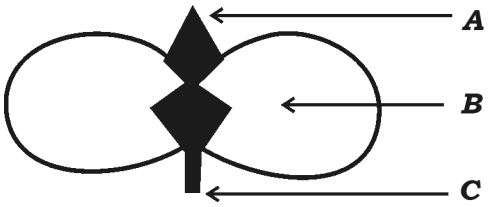
35. What is the role of abscisic acid in plants ?

36. Name any two sexually transmitted diseases and that are caused by the bacteria.

XIV. Answer the following questions : **7 × 2 = 14**

37. Mention the tools used for tracing the evolutionary relationships between the organisms.

38. Observe the given below figure :



Germination of Seed

a) Which parts of the plant will develop from *A* and *C* ?

b) What is the role of *B* in germination ?

39. List the differences between the biodegradable substances and non-biodegradable substances.

40. Draw the diagram to show the structure of nephron and label Bowman's capsule.

41. How does the embryo get nourishment inside the mother's body ?

42. Name the gland that secretes insulin hormone and mention the function of this hormone.

43. Write the differences between homologous organs and analogous organs.

XV. Answer the following questions : **3 × 3 = 9**

44. What is pollination ? What are the changes that occur in the flower after pollination ?

45. How is ozone layer formed at higher levels of atmosphere and what is its function ?

46. Tall pea plant producing red flowers (*TT RR*) is crossed with short pea plant producing white flowers (*tt rr*).

i) Mention the type of plants produced from these plants in the F_1 generation.

ii) Write the ratio of plants obtained in the F_2 generation by crossing the plants of F_1 generation and name the varieties of plants obtained.

OR

Analyse the situations given below. Answer the questions given.

Situation 1 : The number of green grasshoppers in a green zone has been increasing from one generation to another generation.

Situation 2 : The number of brown grasshoppers in the same green zone has been reducing.

Here,

a) Where would genetic drift be happened more ? Why ?

b) How can natural selection be considered as an important factor in organic evolution ?

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XVI. Answer the following questions : **2 × 4 = 8**

47. Draw the diagram showing the structure of human brain. Label the following parts.

i) Hypothalamus

ii) Pons.

48. Write any four differences between aerobic and anaerobic respiration.

OR

Explain the role of xylem and phloem tissues in the transportation of materials in plants.

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