5 △ CCE PF/NSR & NSPR(C)/500/6665

C

Question Paper Serial No. 500

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Code No. : 83-E

CCE PF
UNREVISED
FULL SYLLABUS
NSR & NSPR

ವಿಷಯ : ವಿಜ್ಞಾನ

Subject : SCIENCE

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

(ಇಂಗ್ಲಿಷ್ ಮಾಧ್ಯಮ / English Medium)

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

(Private Fresh / 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)

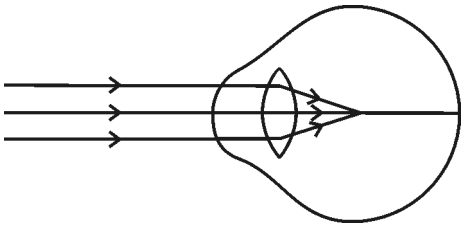
I. *Four* alternatives are given for each of the following questions / incomplete statements. Choose the correct alternative and write the complete answer along with its letter of alphabet. 4 × 1 = 4

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

   (A) Ammeter (B) Voltmeter

   (C) Galvanometer (D) Battery

2. Observe the given figure. Identify the eye defect indicated in this figure.



   (A) Presbyopia (B) Hypermetropia

   (C) Myopia (D) Cataract

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 : 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. To get an image of the same size of the object, at what position an object is to be placed in front of a concave mirror ? Mention the nature of the image formed.

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) How does rainbow form in the nature ? Explain. Mention the colour of the light that bends the most and that bends the least.

b) How does the eye lens accommodate to see the distant objects and nearby objects ? Explain.

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. The reactants that exchange ions by reacting with each other and form a precipitate among the following are

(A) $BaCl_2$ and Na_2SO_4 (B) Al_2O_3 and HCl

(C) NaOH and H_2SO_4 (D) Na_2O and CO_2

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. Packets of chips are flushed with nitrogen gas. Why ?

21. An iron nail is dropped into a test tube having copper sulphate solution. The iron nail gradually turns to brownish colour. Why ?

22. What is hydrogenation ?

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. "Calcium oxide and carbon dioxide are produced on heating calcium carbonate." Write the balanced chemical equation for this reaction. Mention the type of this chemical reaction.

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

26. What are alloys ? Write the constituents of bronze.

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

How are metals in the middle of the reactivity series extracted from their ores ? Explain.

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 salts used in the following situations and write their molecular formula :

a) To remove permanent hardness of water.

b) To make drinking water free from germs.

c) To support fractured bones in their right position.

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) How will ethanol be oxidised ?

b) Explain the cleaning action of soaps.

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. Write two examples for the organisms that reproduce by binary fission.

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 figures :

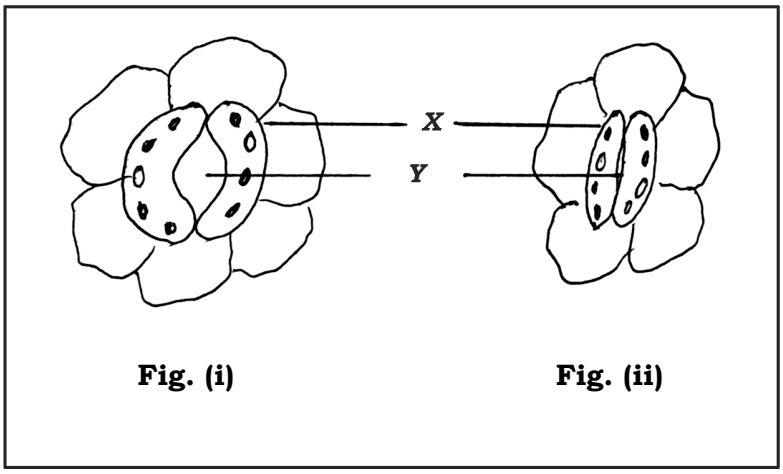


Fig. (i) **Fig. (ii)**

a) Which figure indicates the massive amount of exchange of gases ? Why ?

b) Name the parts *X* and *Y*. What is the function of the part *X* ?

39. Give an example for a food chain of grassland ecosystem. If there is an increase in the number of organisms in the second trophic level, how does this affect on that food chain ?

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

41. What is vegetative reproduction ? What are its advantages ?

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. Coal and petroleum products should be used judiciously. Why ?

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 could genetic drift be happened more ? Why ?

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

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. Explain the digestion of food materials in stomach and small intestine.

OR

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