ಕರ್ನಾಟಕ ಪ್ರೌಢಶಿಕ್ಷಣ ಪರೀಕ್ಷಾ ಮಂಡಳಿ

ಮಲ್ಲೇಶ್ವರಂ, ಬೆಂಗಳೂರು–560003.

KARNATAKA SECONDARY EDUCATION EXAMINATION BOARD

Malleshwaram, Bengaluru – 560003.

2020-21 MODEL PAPER - 2

Subject : SCIENCE **Subject Code : 83E**

Time : 3 hrs. 15 minutes **Max. Marks : 80**

English Medium

Regular Fresh

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 38 objective and subjective types of 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.

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 x 1 = 4

1. The source of energy in nuclear power reactor is :

   A. Nuclear fission reaction

   B. Exothermic chemical reaction

   C. Nuclear fusion reaction

   D. Controlled nuclear fission chain reaction

2. Which of the following is NOT a property of magnetic lines?

   A. Magnetic field lines are dense near poles

   B. Magnetic field lines are closed loops

   C. Magnetic field lines intersect each other

   D. Magnetic field lines emerge from north pole and merge at the south pole

3. The work done in moving a charge of 2C across two points having a potential difference 12V is :

   A. 24 J

   B. 6 J

   C. 14 J

   D. 10 J

4. The correct way of using electrical appliances in domestic electric circuit is

   A. Connecting electrical appliances in series

   B. using an electrical appliance of 880 W power in 5A electric circuit

   C. Connecting main fuse to electrical appliances in parallel

   D. using an electrical appliance of 2 KW power in 5A electric circuit

II. Answer the following questions. 2 x 1 = 2

5. State Fleming's left hand rule.

6. Name the lens that always produces erect, diminished and virtual image.

III. Answer the following questions. 2 x 2 = 4

7. Draw the diagram of the electric circuit used to study Ohm's law and label voltmeter.

8. 'Bio-mass is a renewable source of energy'. Justify this statement with suitable reasons.

IV. Answer the following questions. 3 x 3 = 9

9. Draw the ray diagram to show the formation of image by a convex lens when the object is placed beyond $2F_1$. Mention the position and nature of the image with help of the diagram. (F_1 : Principal focus of the convex lens)

10. What is electric current? Mention the use of battery in an electric circuit. Write the factors on which the resistance of a conductor depends.

11. An electric lamp whose resistance is 20 Ω and a conductor of 4 Ω resistance are connected in series to a 6V battery. Find the current through the circuit and the potential difference across the electrical lamp and conductor.

OR

A copper wire has diameter 0.5 mm and resistivity of 1.6×10^{-8} Ω m. What should be the lenght of this wire to make its resistance 10 Ω.

V. Answer the following question. 1 x 4 = 4

12. State the laws of refraction of light. Different media have different refractive index. Why? 'The refractive index of glass is 1.5'. What is the meaning of this statement?

OR

A concave lens of focal length 15 cm forms an image 10 cm from the lens. How far is the object placed from the lens? Find the magnification produced by the lens. With the help of this mention the nature of the image.

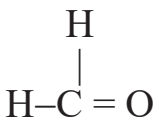
VI. Answer the following question. **1 x 5 = 5**

13. Explain Faraday's experiment of magnet and coil. What factors can be observed when the magnet is replaced by a coil carrying current? What are the conclusions that can be drawn by you from these experiments? State electromagnetic induction with the help of this experiment.

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 x 1 = 2**

14. The name of carbon compound  is :

    A. Methanal

    B. Methanone

    C. Ethanal

    D. Methanoic acid

15. Observe the following stages of extraction of a metal from its ore.

    Sulphide ore → ☐ → Reduction → Purification

    The process that has to be done in the empty space is

    A. Electrolysis

    B. Calcination

    C. Roasting

    D. Oxidation

VIII. Answer the following questions. **4 x 1 = 4**

16. What is a strong acid?

17. State modern periodic law.

18. The metallic property of elements increases down the group in the modern periodic table. Why?

19. What is substitution reaction?

IX. Answer the following questions. 3 x 2 = 6

20. The compounds C_2H_4, C_3H_6, C_4H_8, C_5H_{10} are in homologous series. Why? Write the general name and general formula for these carbon compounds.

21. The atomic number of an element is 20. In which period of the modern periodic table, could this element be placed? Why? How will you decide whether the element is a metal or a non-metal?

22. Why is a metal oxide called a basic oxide? Name the products obtained when copper oxide reacts with dilute hydrochloric acid.

OR

The test tube 'A' contains distilled water, test tube 'B' contains acidic solution and test tube 'C' contains basic solution. How could these samples be identified using red litmus paper.

X. Answer the following questions. 3 x 3 = 9

23. Draw the diagram of the arrangement of the apparatus showing the reaction of zinc granules with dilute sulphuric acid and testing hydrogen gas by burning. Label the following parts :

    (i) Zinc granules

    (ii) Delivery tube

24. Explain the properties of carbon due to which it forms large number of compounds.

OR

Explain the cleaning action of soaps.

25. Draw the diagram of the apparatus used in the electrolytic refining of copper. Label the following parts.

    (i) Cathode

    (ii) Anode mud

XI. Answer the following question. **1 x 4 = 4**

26. a) Explain the formation of the ionic compound magnesium chloride with the help of electron dot structure.

    b) Write the balanced chemical equation for the reaction of aluminium metal with steam.

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 x 1 = 2**

27. The materials that change slowly their form and nature are

    A. Used tea leaves

    B. Peels of vegetables

    C. Waste papers

    D. Plants fibres

28. The pattern of response in the roots of plants is

    A. Directional and negatively phototropic

    B. Posivibely phototropic and negatively geotropic

    C. Non-directional and positively geotropic

    D. Growth dependent and positively hydrotropic

XIII. Answer the following questions. **2 x 1 = 2**

29. Mention the reason for the depletion of ozone layer.

30. Name any two ancient systems that were practiced to harvest rain water.

XIV. Answer the following questions. 3 x 2 = 6

31. How is oxygen rich blood from the lungs supplied to all the cells in the human body?

OR

How are the products of photosynthesis from the leaves get transported to all other parts of the plant?

32. The people who live in and around the forest are said to be the stakeholders of the forest. Why? Explain.

33. Draw the diagram showing the germination of pollen on stigma and label `female germ cell'.

XV. Answer the following questions. 3 x 3 = 9

34. How do genes control the expression of 'tall' or 'short' traits in plants?

Or

'Acquired traits of an individual organism during its life time cannot direct the evolution'. Explain this statement with an illustration.

35. In female reproductive system,

(i) How does an egg from the ovary reach uterus and develops into foetus?

(ii) What are the changes that occur in the uterus for the development of the foetus?

Or

In sexual reproduction,

(i) how does the re-establishment of DNA amount occur in the new generation?

(ii) how is the amount of variations increase among the individuals of each of the population?

36. Draw the diagram showing the structure of nephron. Label the following parts.

(i) Bowman's capsule

(ii) Collecting duct

XVI. Answer the following questions. 2 x 4 = 8

37. a) How do the 'homologous characteristics' in different organisms help to identify the evolutionary relationships?

    b) How does Mendel's 'monohybrid cross' experiment clarify that, `the traits of an organism independently inherit to the progenies?

38. a) Name the mineral required for the production of thyroxine hormone. What is the use of this hormone to our body?

    b) What are involuntary actions? Name the parts of the human brain that control voluntary and involuntary actions.