MODEL TEST PAPER

Sub : Science & Technology Class : X
Time : 3 hours Max. marks : 75

General Instructions :-

1) All the questions are compulsory.
2) In section A questions 1-5 carry 1 mark each, questions 6-10 carry 2 marks each, questions 11-17 carry 3 marks each and questions 18-20 carry 5 marks each.
3) In section B questions 21-23 carry 1 mark each, questions 24 & 25 carry 2 marks each, questions 26-29 carry 3 marks each and the 30^{th} question carries 5 marks.
4) No overall choice. However, internal choice has been provided in some questions. Only one question must be attempted in such cases.

Section A

1. What do you mean by the solar constant? Give its value.

2. Define flux.

3. Which is the largest known asteroid?

4. Name one strong acid and one weak base.

5. Give the formula of white lead. Which organic compound is used for its preparation?

6. State the Big Bang theory and the Steady State theory.

7. What do you mean by 'The Van Allen radiation belts'?

8. What do you mean by remote sensing? Name any two satellites used for remote sensing.

9. Three bulbs each of power 40W, 100W, and 60W are given. Which of these bulbs will have more brightness and why?

10. Give any two characteristic features of dynamic equilibrium.

11. a) Derive the formula of magnification for a convex lens.
    b) The size of the image is twice of that of the object. If the object is placed 20cm away from a convex lens , find the image distance.

OR

a) Derive the total resistance when four resistors are connected in parallel. b) Calculate the total resistance when 23 resistors each of 4 ohms are connected in series .

12. Find the energy released in MeV when 1,50,000 grams of Uranium – 235 undergoes nuclear fission. Find the power when the above mass undergoes nuclear fission in 10 hours. (1 MeV = 1.6×10^{-13} J, C = 3×10^{8} m/s)

    OR

    250 grams of ethanol is burnt. The energy released is used to heat 1200 grams water from 25^{o}C to 40^{o}C.Find the calorific value of ethanol. Also define calorific value.

13. Draw a neat and well labeled diagram of the Bessemer converter. Write the reactions for the removal of the impurities in the Bessemer converter.

14. Give the equations for: -
    a) Preparation of nylon
    b) preparation of soap
    c) commercial method for the preparation of acetic acid.

15. A compound 'A' of the formula C_3H_6O is oxidised to a compound 'B' of the formula $C_2H_4O_2$ in the presence of a compound 'C'. Compound 'B' reacts with NaOH to give sodium ethanoate as one of the by-product. Name the compounds 'A', 'B', 'C'. Give the chemical equations for the reaction between 'A' and 'B' and between 'B' and NaOH.

16. a) Give the equations for the preparation of sulphuric acid by the contact process.
    b) In the contact process why sulphur trioxide is is not mixed with water to form sulphuric acid.

    OR

    Describe the process of 'Steam reforming' with the help of the necessary equations.

17. Describe an activity to show that ammonia is highly soluble in water. Write the physical properties of ammonia.

18. Explain the construction and working of a compound microscope with the help of a neat and labeled ray diagram. Write the formula for the magnification in the case of a simple microscope.

19. Explain the working of a DC motor with the help of a labeled diagram. Give the principle for the working of an AC generator.

    OR

    With the help of a well labeled diagram describe the refining of petroleum in the

fractional distillation tower. Name any two non-volatile components of petroleum.

20. a) Describe the process of enrichment of haematite.
b) With the help of necessary chemical equations describe 'Bayer's process.

Section B

21. What decides the functional property of a gene?

22. What do you mean by parthenogenesis?

23. Give the function of the stem cells.
24. Give the major consequences when excessive carbon dioxide and methane are present in the earth's atmosphere.

25. Draw a well labeled diagram of a part of the phloem tissue.

26. Describe any three methods of controlling gaseous air pollutants.

27. Describe the nutrition in amoeba with the help of neat and labeled diagrams.

28. Give the three main features of the double helical model of DNA.

29. Explain the mechanism of blood clotting.

OR

Give the functions of the following:-
a) Cerebellum
b) Cerebrospinal fluid
c) synapse

30 a). Draw a well labelled diagram of the human male reproductive system.

b) Explain the process of fertilization in the human beings.