Class: X
Science and Technology

MM. 75

General Instructions

1. The question paper consists of two sections, A and B. You are to attempt both the sections.
2. Marks allocated to every question are indicated against it.
3. Question no. 1- 5 in section A and 21 -23 in section B are to be answered in one word or one sentence.
4. Question no: 6-10 in section A and 24&25 in section B are to be answered in 30-40 words each.
5. Question no: 11-17 in section A and 26 -29 in section B are to be answered in 40 to 50 words each.
6. Question no: 18- 20 in section A and 30 in section B are to be answered in 60- 80 words each.

SECTION - A

Q.1.What is the molecular formula & name of aldehyde which is derived from pentane.(1M)

Q.2. What are meteorites? (1M)

Q3.At 298K, equilibrium concentrations of the reactants and products for reaction,

$PCl_{3\,(g)} + Cl_{2\,(g)} \longleftrightarrow PCl_{5\,(g)}$ are as follows:

$[PCl_3] = 0.1$ mol L^{-1}, $[Cl_2] = 0.2$ mol L^{-1}, $[PCl_5] = 0.3$ mol L^{-1}

Calculate the equilibrium constant at this temperature. (1M)

Q.4.What happens to the resistivity of a conductor if its length is doubled? (1M)

Q.5. What is rust? Write its chemical formula. (1M)

Q.6. How is the colour of the star related to its temperature, explain. (2M)

Q.7. (a) Identify the weak and strong acid - HCl, CH_3COOH.

(b) If the Kc value is high what does it indicate? (2M)

Q.8. (a) Expand (i) ISRO (ii) INSAT.

(b) Why does the pole star remain at one place where as other stars appear to move from east to west? (2M)

Q.9.Explain why

a) The surface of copper gets covered with a black substance when it is heated in air.

b) Iron is never used in the pure state.

OR

a) Corrosion of metals is an advantage sometimes, justify.

b) Name two metals that is refined and purified by distillation. (2M)

Q.10. Calculate the amount of energy produced if 2gm of a substance is completely converted into energy. (2M)

Q.11. Name the lightest element which is the main component in the sun. With a help of a neat labeled diagram, describe how this element is prepared in the laboratory.

OR

An important compound which has a pungent smell is used in the manufacture of fertilizers. Identify the compound and show with the help an activity that this compound is highly soluble in water and is alkaline in nature. Support with a labeled diagram. (3M)

Q.12. (a) Two lamps, one rated 100w at 220v and the other 60w at 220v are connected in parallel to a 220v supply. What current is drawn from the supply line?

(b)Differentiate between A.C. current and D.C current. (3M)

Q.13. (a) In preparation of sulphuric acid, SO_3 is not dissolved directly in water, give reason.

(b) Explain why white fumes are seen when a glass rod dipped in conc. HCl is brought near a jar containing ammonia gas.

(c)Why does the skin get burnt when conc. H_2SO_4 falls on the hand? (3M)

Q.14. (a) Name the device, which converts mechanical energy into electrical energy. State the principle on which it works.

(b) On what factors does the force experienced by a current carrying conductor placed in a uniform magnetic field depend? (3M)

Q.15. A yellowish white powder, which smells of chlorine is used for bleaching purposes. Identify the compound and draw the diagram to show how this compound is manufactured. What happens when this compound reacts with dil. HCl? (3M)

Q.16. (a) What is the focal length of a plane glass sheet?

(b) What is the focal length of a convex lens of focal length 30 cm in contact with a concave lens of focal length 20 cm? Is the system a converging or a diverging lens? (Ignore the thickness of the lens).

(c) Write down the relationship between focal length and radius of curvature.

OR

(a) A concave mirror produces three times magnified real image of an object placed 10 cm in front of it. Where is the image located? What is the nature of the image?

(b) State the condition required for total internal reflection to take place. (3M)

Q.17.(a)Explain why soaps are not effective cleansing agents in hard water.

(b) Give two advantages of vulcanized rubber over natural rubber. (3M)

Q.18.(a) Describe the process by which energy is released in the sun. Also name the scientist who first proposed it?

(b)Give two advantages of nuclear fusion over nuclear fission.

(c)What was the source of the α- particle in Rutherford's experiment for transforming atomic nuclei. (5M)

Q.19.Explain the following terms with suitable equations.

a)Combustion b) Saponification c)Decarboxylation

d) Hydrogenation e) Esterification (5M)

OR

(a) Explain the following terms with suitable equations.

1) Polymerisation 2) Fermentation

(b) Give the chemical formula and IUPAC name of Acetone.

(c) What happens when it reacts with:

(i) HCN and (ii) H2 in presence of $NaBH_4$. Give equations only. (5M)

Q.20. (a) With the help of a labeled diagram explain destructive distillation of wood.
(b) Give two advantages of smokeless Chulhas over traditional chulhas.
(c) Name two components obtained during fractional distillation of petroleum that are not used as fuel.

OR

(a)The calorific values of three fuels X,Y and Z are 17 KJg^{-1},50 KJg-1,150 KJg^{-1} respectively. On combustion 'Z' explodes forming steam where as 'X' and 'Y' produces CO_2 and leaves no residue. Which one of the three fuels is most ideal? Give reasons.
(b)What is green house effect? Name some green house gases.
(c)Name two elements used in solar cells. (5M)

SECTION B

Q.21. Define Holozoic Nutrition. (1M)
Q.22. Why does a piece of bread taste sweet on chewing? (1M)
Q.23. What is pace maker? (1M)
Q.24. Draw a neat labeled diagram of a flower showing male and female reproduction parts. (2M)
Q.25. List four functions of blood. (2M)
Q.26. (a) What are autosomes?
(b) Why is DNA called a polynucleotide?
(c) Write a note on composition of nucleotide? (3M)
Q.27. (a) What is meant by nastic movements?
(b) Who introduced the term 'hormones'? Give three important characteristics of hormones. (3M)
Q.28. (a) Name the book in which Lamarck explained evolutionary process
(b) Write the salient features of Darwinism.

OR

Define the following terms:
a) Genetics b) Analogous organs c) Vestigial organs (3M)
Q.29. (a) What is parthenogenesis?
(b) Why is vegetative propagation as a method of plant propagation, advantageous?
(c) Write about any one method of artificial vegetative propagation. (3M)
Q.30.(a) How can the volume of solid waste be reduced? Also draw a labeled diagram.
(b)What is the cause of ozone depletion? What are it's effect?
(c)Differentiate between biodegradable and non-biodegradable pollutants. (5M)