

SCIENCE AND TECHNOLOGY— 2007

Q. 1. Classify the following reactions into slow and fast reaction :

- i. Reaction between an acid and a base,
- ii. Rusting of iron. (1marks)

Q. 2. Give the names of the functional groups

(i) — CHO

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(ii) — C=O 1

Q. 3. What is a Galaxy ?(1marks)

Q. 4. What is the S.I. unit of electric potential ? (1marks)

Q. 5. (a) Give Arrhenius definition of an acid and a base.(1 marks)

(b) Choose strong acid and strong base from the following :

CH₃COOH, NH₄OH, KOH, HCl. 2

Q. 6. What is Tollen's reagent ? What would you observe on heating Tollen's reagent with formalin in a test tube ? (2 marks)

Q. 7. Distinguish between polar and equatorial orbits for artificial satellites. Illustrate the two orbits on a diagram.(2 marks)

Q. 8. An electric iron has a rating of 750 W, 220 V. Calculate

- i. current passing through it, and
- ii. its resistance, when in use. (2 marks)

Q. 9. Name the raw materials that are required for the manufacture of washing soda by Solvay Process. Describe the chemical reactions involved in the process. (3 marks)

Q. 10. What is 'liquor ammonia' ? Describe with a diagram, 'Fountain Experiment' to demonstrate the following properties of ammonia :

- i. high solubility in water.
- ii. its alkaline nature.(3 marks)

Q. 11. Give reasons for the following :

- i. A peculiar smell is observed near the preserved specimens in biology laboratory.
- ii. Methanal undergoes addition reaction with hydrogen cyanide,
- iii. Propanone can be used as a nail polish remover. (3 marks)

Q. 12. A concave lens has focal length of 20 cm. At what distance from the lens a 5 cm tall object be placed so that it forms an image at 15 cm from the lens ? Also calculate the size of the image formed. (3 marks)

Q. 13. (a) Why is the Solar Cooker box covered with a plane glass plate ?

(b) Why is energy of water flowing in a river considered to be an indirect form of Solar energy ?

(c) How is the fission of nucleus brought about ? (3marks)

Q. 14. (a) What is meant by 'Electric Resistance' of a conductor ?

(b) A wire of length L and resistance R is stretched so that its length is doubled and the area of cross-section is halved. How will its :

- i. resistance change ?
- ii. resistivity change ? (3marks)

Q. 15. (a) Name one main ore of Aluminium. Write its formula. Which two main impurities are associated with this ore ?

(b) Describe with chemical equations, the method employed for the enrichment of the above named ore.

Or

(a) Why is sulphuric acid called 'King of Chemicals' ?

(b) Describe the three chemical reactions that take place during the conversion of sulphur dioxide to sulphuric acid in the 'Contact Process'.

(c) Why should water be never added dropwise to concentrated sulphuric acid ? (5 marks)

Q. 16. Define the term, 'Critical Angle'. What is meant by 'total internal reflection' ? State two essential conditions for total internal reflection to take place. With the help of a ray diagram, illustrate an application of total internal reflection.

Or

(a) What is meant by a 'magnetic field' ?

(b) How is the direction of magnetic field at a point determined ?

(c) Describe an activity to demonstrate the direction of the magnetic field generated around a current carrying conductor.

(d) What is the direction of magnetic field at the centre of a current carrying circular loop ? (5 marks)

SECTION - B

Q. 17. Name the term for transport of food from leaves to other parts of the plant. (1 marks)

Q. 18. What is a neuron ? (1 marks)

Q. 19. Describe the mechanism of blood clotting. (2 marks)

Or

State the two vital functions of the human kidney. Name the procedure used in the working of artificial kidney. (2 marks)

Q. 20. Name the two hormones secreted by pancreas. Write one function of each hormone named. (2 marks)

Q. 21. (a) What is fertilization? Distinguish between external fertilization and internal fertilization.

(b) What is the site of fertilization in human beings? (3 marks)

Q. 22. Define the terms :

- i. Analogous organs
- ii. Vestigial organ
- iii. Sex chromosome (3 marks)

Q. 23. (a) What is 'environmental pollution'?

(b) Distinguish between biodegradable and non-biodegradable pollutants.

(c) Choose the biodegradable pollutants from the list given below :
Sewage, DDT, radioactive waste, agricultural waste.

Or

Suggest three ways to maintain a balance between environment and development to survive. (3 marks)

Q. 24. (a) Draw a diagram of a 'palisade cell'.

(b) Label vacuole, chloroplast, cell wall and cytoplasm on the diagram drawn.

(c) Name the two stages in photosynthesis. (5 marks)