

Msc. II - Sem. IV - Oct. 2016
Analy - Chemistry - Paper I

QP Code : 76533

(2½ Hours)

[Total Marks : 60

- N. B. : (1) All questions are compulsory.
(2) Figures to the right indicate full marks.
(3) Use of log table/non-programmable calculator is allowed.

1. (a) Attempt any two of the following:

- (i) Enlist the precautions to be taken and marking to be done while storage of raw materials and finished products.
(ii) What are the different grades of chemicals used in laboratories?
(iii) State the basic criteria to be fulfilled before applying for any patent.
(iv) How is safety ensured while transporting the highly flammable materials?

(b) What is patent? What is the significance of the patented work? How is it beneficial? 4

OR

(b) Write a note on "ASTM data" with reference to quality testing material. 4

2. (a) Attempt any two of the following: 8

- (i) Give the principle and applications of reverse osmosis.
(ii) Describe the different membranes used in membrane separation process.
(iii) Differentiate between dialysis and electro-dialysis with respect to separation mechanism and applications.
(iv) Discuss the principle and applications of microfiltration.

(b) Describe the operation of Flow Injection Analysis system for the determination of chloride in water. 4

OR

(b) With suitable examples give a brief account of automation in chemical analysis. 4

3. (a) Attempt any two of the following: 8

- (i) What are the various challenges overcome by the use of photochemical reactions?
(ii) Explain the Process Intensification (PI) and in-process monitoring technique with respect to green chemistry.

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- (iii) Why are supercritical fluids preferred as compared to organic solvents?
- (iv) Describe electrochemical synthesis with suitable examples.
- (b) With appropriate example of each, explain the terms "atom uneconomic" and "atom economic" reactions. 4

OR

- (b) Explain the concept of green chemistry. Why is it advantageous to adopt green chemistry approach?

4. (a) Attempt **any two** of the following: 8

(i) How are nano-materials classified? What are the different techniques used for their characterization?

(ii) Discuss the principle and instrumentation of SDS PAGE and iso-electric focussing.

(iii) With a neat block diagram explain the working of gel electrophoresis.

(iv) Explain the technique micellar electro-kinetic capillary chromatography. Why is it called chromatography?

- (b) Which are the detectors used in capillary electrophoresis? Explain any one in detail. 4

OR

- (b) Write a note on 'carbon nano-tubes'. 4

5. (a) Attempt **any four** of the following: 12

(i) In brief explain the first aid treatment given to a victim of acid burn in laboratories.

(ii) What is transportation symbol? Give any three examples of it.

(iii) Discuss the application of multilayer film in the analysis of sugar in blood.

(iv) State the characteristics of membrane.

(v) Describe the zero waste concept of green chemistry.

(vi) Give an account of various supporting media used in electrophoresis.

(vii) What are the applications of nano-materials?

(viii) Describe the applications of SDS PAGE and iso-electric focussing.