

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:

- Enlist the precautions to be taken and marking to be done while storage of raw materials and finished products.
- What are the different grades of chemicals used in laboratories?
- State the basic criteria to be fulfilled before applying for any patent.
- 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

- Give the principle and applications of reverse osmosis.
- Describe the different membranes used in membrane separation process.
- Differentiate between dialysis and electro-dialysis with respect to separation mechanism and applications.
- 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

- What are the various challenges overcome by the use of photochemical reactions?
- 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.