

Day: : Monday
Date: 15/10/2018

W-2018-0986

Time: 03.00 PM TO 06.00 PM
Max. Marks: 60

N.B:

- 1) All questions are **COMPULSORY**
- 2) Figures to the right indicate **FULL** marks.
- 3) Both sections should be written in **SAME** answer book.

SECTION – I

Q.1 Attempt any **THREE** of the following **(15)**

- a) Sketch the schematic diagram of the gas chromatography. Discuss the instrumentation of gas chromatography.
- b) Discuss the analytical application of ion – exchange chromatography.
- c) Describe the Craig counter current extraction process.
- d) Explain the principle and working of column chromatography.
- e) Describe any one method for the extraction of solute from aqueous phase.

Q.2 A) Attempt any **ONE** of the following **(05)**

- a) Discuss the principle of ion exchange chromatography. Describe what is meant by cation and anion exchange resins.
- b) Explain how multiple extractions are more efficient than single extraction

B) Solve any **TWO** of the following **(10)**

- a) 3 gm of solute is dissolved in 50ml of aqueous solution. Calculate amount of solute remain unextracted in aqueous phase after
 - i) Single extraction of 40ml ether
 - ii) 5 successive extraction with 25ml ether (Given $D = 10$)
- b) A mixture of gases composed of X, Y, and Z was resolved by gas chromatography. The peak areas were found to be 25cm^2 , 15cm^2 and 50cm^2 respectively. Calculate percentage composition of mixture.
- c) Calculate HETP from the following data for peak.
Peak I : Retention time $t_1 = 85$ sec. peak width = 5.5 sec.
Peak II : retention time $t_1 = 120.8$ sec. peak width = 7.5 sec.

SECTION - II

Q.3 Attempt any **THREE** of the following **(15)**

- a) Discuss the method to control the pollution of carbon monoxide in air.
- b) What is green house effect? Discuss their contribution to global warming.
- c) What do you mean by a term called ‘Smog’? How does photochemistry Play a role in formation of photochemical smog?
- d) How do you carry out sampling process for polluted water required for its analysis? Discuss the various factors required for sampling.
- e) What do you understand by ozone depletion? Explain the impacts of ozone holes on the human health.

Q.4 Attempt any **THREE** of the following **(15)**

- a) “Particulates cause serious hazards to the plant as well as animal world” Explain.
- b) Explain in detail about any one pre concentration technique for the water sample.
- c) Describe the measurements of BOD and COD. Explain their differences in two tests.
- d) Write a note on indoor air pollutants.
- e) Define the following terms
 - i) Eutrophication
 - ii) Acid mine drainage