

PARUL UNIVERSITY  
PARUL INSTITUTE OF APPLIED SCIENCES  
MID SEMESTER INTERNAL EXAMINATION, MARCH 2020  
M. Sc Semester II/ IMSC SEM VIII

Subject: Chemistry

Paper Code: 11205154

Date: 5/03/2020

Maximum Marks: 40

Title of the paper: Analytical Chemistry II

Time: 2:30 to 4:00 pm

Instructions: 1. All questions are compulsory and options are given in first and second question only.

2. Numbers to the right of question indicate the marks of respective question.

- Q. 1** Attempt any one question of the following. (08)  
(i) Explain the principle and instrumentation of mass spectrometer  
(ii) Give the definition of DO, discuss any one method for its measurement and its significance.
- Q. 2** Attempt any three questions of the following. (12)  
(i) Briefly explain the different ionization techniques in mass spectroscopy  
(ii) Write a short note on Quadrupole and Time of Flight analyzer in mass spectroscopy  
(iii) Explain in brief about Faraday Cup and Photomultiplier Detectors in Mass Spectroscopy  
(iv) Discuss the sedimentation technique.  
(v) Write a short note on Inorganic matters of soil.
- Q. 3** Do as directed. Attempt all five questions. (05)  
(i) Define EI and CI in mass spectrometry  
(ii) What is MALDI  
(iii) Define the base peak of a mass spectrum?  
(iv) Give the name of sources for organic matter of soil.  
(v) What is biological nitrogen fixation?
- Q. 4** Write correct option in your answer sheet for following 15 multiple choice questions. (15)
- MCQ 1 Choose the write name of colorimetric methods for the DO measurement.  
(A) Indigo Carmine (B) Rhodazine D  
(C) Both A and B (D) None of it
- MCQ 2 What is the BOD standard for moderately polluted rivers.  
(A) < 1mg/L (B) 2-8 mg/L  
(C) 150-200 mg/L (D) > 200 mg/L
- MCQ 3 Which indicator is used in open reflux method of COD measurement?  
(A) Methyl orange (B) Phenolphthalein  
(C) FAS (D) Ferroin
- MCQ 4 How much percentage is covered by inorganic matter in soil composition?  
(A) 25% (B) 5 %

- MCQ 5 (C) 45 %  
The typical flight time for ions is (D) 20%  
(A) > 50  $\mu$ s (B) 1- 50  $\mu$ s  
(C) 50 - 100  $\mu$ s (D) None of the above
- MCQ 6 Molecular ions are formed when energy of electron beam reaches (A) 1-2 eV (B) 10-15 eV  
(C) 2 eV (D) 70 eV
- MCQ 7 The ionizing agent in Chemical ionization of Mass Spectrometry is Oxygen and (A) High energy electrons (B) Laser beam  
(C) Reagent Gas ions (D) High Potential electrode
- MCQ 8 ----- and ----- are used in Negative chemical ionization in Mass Spectrometry  
(A) Oxygen and Hydrogen (B) Helium and Neon  
(C) Hydrogen and Nitrogen (D) Helium and Nitrogen
- MCQ 9 Which species of the following is used to bombard with the sample for which mass spectroscopy has been performed?  
(A) Electrons (B) Protons  
(C) Gamma rays (D) Neutrons
- MCQ 10 In mass spectrometer, the ions are sorted out in which of the following ways?  
(A) By accelerating them through electric field (B) By accelerating them through magnetic field  
(C) By accelerating them through electric and magnetic field (D) By applying a high voltage
- MCQ 11 The isotope used in Plasma Desorption technique to highly energetic fission fragment  
(A) Californium-252 (B) Iodine-131  
(C) Cobalt - 60 (D) Uranium-235
- MCQ 12 Which of the following separate the ions according to their mass-to-charge?  
(A) Ion source (B) Detector  
(C) Magnetic sector (D) Electric sector
- MCQ 13 Select the correct range of DO which supports the growth of fish.  
(A) < 3 PPM (B) 3-5 PPM  
(C) 6 PPM (D) > 7 PPM
- MCQ 14 Which are the sources of particulate matter?  
(A) SO<sub>2</sub> (B) NO<sub>2</sub>  
(C) Volatile organic compounds (D) All of them
- MCQ 15 What is the chemical formula of olivine?  
(A) CaSO<sub>4</sub>·2H<sub>2</sub>O (B) (MgFe)<sub>2</sub>·SiO<sub>4</sub>  
(C) KAlSi<sub>3</sub>O<sub>8</sub> (D) None of them

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