PARUL UNIVERSITY
PARUL INSTITUTE OF APPLIED SCIENCES
MID SEMESTER INTERNAL EXAMINATION, MARCH 2020
B. Sc Semester VI
Subject: MPCM

Paper Code:11105357 **Title of the paper: MPCM-II**
Date: 06-03-2020 **Time: 2:30 pm**
Maximum Marks: 40

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) What is XRD. Explain the instrumentation of XRD.
(ii) What is the difference between contact and non-contact mode?

Q. 2 Attempt any three questions of the following. **(12)**
(i) What is the difference between SEM & TEM?
(ii) What is the role of the cantilever?
(iii) Write the difference between voltammetry and polarography.
(iv) write the advantages of dropping mercury electrode.
(v) What is atomic force microscopy?

Q. 3 Do as directed. Attempt all five questions. **(05)**
(i) Draw the schematic diagram of TEM.
(ii) Define voltammetry.
(iii) What is diffusion current.
(iv) Write two limitations of DME.
(v) write the name of electrodes which are used in voltammetry.

Q. 4 Write correct option in your answer sheet for following 15 multiple choice questions. **(15)**

MCQ 1 The resolving power of TEM is derived from _____
(A) electrons (B) Specimens
(C) power (D) ocular system

MCQ 2 ESCA can identify elements in the periodic table above which of the following?
(A) Carbon (B) Helium
(C) Boron (D) Potassium

MCQ 3 Which of the following component of TEM focuses the beam of electrons on the sample?
(A) ocular lens (B) condenser lens
(C) stage (D) Column

MCQ 4 ESCA focusses on which of the following information?
(A) Mass of the electron (B) Charge of the electron
(C) Binding energy of the electron (D) Mass of atoms

MCQ 5 Image formation in electron microscope is based on_____
(A) column length (B) electron number
(C) differential scattering (D) specimen size

MCQ 6 Organic functional groups are polarographically active.
(A) True (B) False

(C) Both (D) None

MCQ 7 Diffusion current is ------ of electrolyte concentaration.

(A) Independent (B) Dependent

(C) Partially dependent (D) None

MCQ 8 In surface spectroscopy , the secondary beam results from

(A) Scattering (B) Sputtering

(C) Emission (D) Any of these

MCQ 9 Which of the following is/are the spectroscopic technique for the analysis of surfaces.

(A) XPS (B) ESCA

(C) AES (D) All

MCQ 10 Auger spectra consist of a few characteristic peak lying in the region of 20 to 1000eV

(A) True (B) False

(C) None (D)

MCQ 11 AES and XPS provide the similar information about the composition of matter.

(A) True (B) False

(C) Can’t say (D) None

MCQ 12 For general use of the X-ray tube, the target is usually made up of

(A) Pt (B) Mo

(C) W (D) All

MCQ 13 Braggs equation is

(A) $2 \sin \theta$ (B) $n\lambda = 2d \sin\theta$

(C) $n\lambda = \sin\theta$ (D) $\lambda = \sin\theta$

MCQ 14 Monochromatic radiations can be obtained by using

(A) Filters (B) Monochromators

(C) Both (D) None

MCQ 15 X-ray can be detected by the methods.

(A) They affect photographic film (B) They penetrate matter

(C) They ionize gases (D) All

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