

PARUL UNIVERSITY
PARUL INSTITUTE OF APPLIED SCIENCES
MID SEMESTER INTERNAL EXAMINATION, APRIL 2017
M. Sc. Semester II
Subject: Chemistry

Paper Code: 11205153

Title of the paper: Physical Chemistry-II

Date: 13 /04/2017

Time: 12.30 p.m. to 02.00 p.m.

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.
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- Q. 1** Attempt any one question of the following. **(08)**
(i) Derive equation for Langmuir Adsorption Isotherm.
(ii) Scintillation counter with a neat labeled diagram.
- Q. 2** Attempt any three questions of the following. **(12)**
(i) Give any four uses of radioactive isotopes.
(ii) Give differences between chemisorption and physisorption.
(iii) Explain phase transfer catalysis with suitable examples.
(iv) Explain extrusion, pellet formation, granulation and spray drying methods for formation of catalyst support.
(v) Give differences between homogeneous and heterogeneous catalysts.
- Q. 3** Do as directed. Attempt all five questions. **(05)**
(i) Define catalyst promoter with example.
(ii) Give full forms of TPD and TGA.
(iii) Explain isotones with suitable example.
(iv) What is transuranic series?
(v) Mention two factors affecting adsorption.
- Q. 4** Write correct option in your answer sheet for following 15 multiple choice questions. **(15)**
- MCQ 1 The electrodes arranged with increasing voltages in scintillation counter are called as.....
(A) Anode (B) Cathode
(C) Dynode (D) Collector electrode
- MCQ 2 Working of scintillation counter is based on
(A) Joule effect (B) Photoelectric effect
(C) Raman effect (D) Faraday effect
- MCQ 3 Which of the following are isoelectronic?
(A) N_2 , CN^- , NO^+ (B) K^+ , Ca^{2+} , Na^+
(C) O^{2-} , S^{2-} , P^{3-} (D) C^{4+} , N^{3-} , He
- MCQ 4 1 femtometer =m
(A) 10^{-9} (B) 10^{-15}
(C) 10^{-12} (D) 10^{-10}

- MCQ 5 $^{12}_6\text{C}$, $^{13}_6\text{C}$ and $^{14}_6\text{C}$ are examples of
 (A) Isotopes (B) Isobars
 (C) Isotones (D) Isosteres
- MCQ 6 $^7_3\text{Li} + ^4_2\text{He} \longrightarrow ^{10}_5\text{B} + ^1_0\text{n}$ is an example of reaction.
 (A) (p, α) (B) (α , n)
 (C) (n, p) (D) (p, n)
- MCQ 7 The anode in Geiger-Muller counter is made up of
 (A) Tungsten (B) Copper
 (C) Silver (D) Gold
- MCQ 8 Nucleons are collectively the total number of in an atom.
 (A) Protons+ electrons (B) Protons+ neutrons
 (C) Neutrons+ electrons (D) Electrons+ positrons
- MCQ 9 is used to remove colouring matter during crystallization of sugar.
 (A) Activated Charcoal (B) Silica
 (C) Platinum (D) Zeolites
- MCQ 10 is used as promoter for Fe catalyst during synthesis of NH_3
 (A) Cr (B) Ni
 (C) Mo (D) Pt
- MCQ 11 The shape of ceramic support in catalytic convertor is.....
 (A) Cylindrical (B) Honeycomb
 (C) Pellet (D) Granules
- MCQ 12 When all active sites on surface of adsorbent are occupied then θ will be
 (A) Less than 1 (B) More than 1
 (C) Equal to 1 (D) None of the above
- MCQ 13 is used as catalyst for production of H_2SO_4
 (A) Ni (B) V_2O_5
 (C) Fe (D) ZnO
- MCQ 14 Gels which are dried by evaporation are called as
 (A) Xerogel (B) Hydrogel
 (C) Aerogel (D) Aquagel
- MCQ 15 Phase transfer catalyst can be used for
 (A) Polymerization (B) Alkylation
 (C) Oxidation (D) All of the above

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