



A Charutar Vidya Mandal's Institution
V.P. & R.P.T.P. SCIENCE COLLEGE
 (AUTONOMOUS) (Grant-in-Aid)
 Affiliated to Sardar Patel University
 VALLABH VIDYANAGAR-388120



Bachelor of Science (Semester IV) External Examination - 2026
US04MACHE02 : ANALYTICAL CHEMISTRY-I

Date: 25-03-26 WEDNESDAY

Time: 01:45 A.M. TO 4:15 P.M.

Total marks : 50

Note: Figures to the right indicate marks of the question.

Q-1 Write the most appropriate answer from the following multiple-choice questions.

[10]

- (1) The solution taken up in the burette is known as _____.
 - (A) Aliquot
 - (B) Titrant
 - (C) Analyte
 - (D) Titrand
- (2) During the titration chemically equivalent amounts of analyte and titrant is known as _____.
 - (A) End point
 - (B) Equivalence point
 - (C) dead point
 - (D) None of the above
- (3) Substance whose standard solution can be prepared by direct weighing in known as _____.
 - (A) Standard solution
 - (B) Primary standard
 - (C) Secondary standard
 - (D) None of the above
- (4) EDTA is the best _____.
 - (A) Complexing agent
 - (B) Indicator
 - (C) Buffer
 - (D) All of these
- (5) Temporary hardness of water is due to _____.
 - (A) $MgCl_2$
 - (B) $Ca(HCO_3)_2$
 - (C) $CaCl_2$
 - (D) $MgSO_4$
- (6) Which of the following indicators is commonly used in complexometric titrations to detect the endpoint of the titration with metal ions?
 - (A) Phenolphthalein
 - (B) Starch solution
 - (C) Eriochrome Black T
 - (D) Bromothymol Blue
- (7) Which of the following is added in the titration of $KMnO_4$?
 - (A) HCl
 - (B) H_2SO_4
 - (C) HNO_3
 - (D) All of these
- (8) Which of the following is redox titration?
 - (A) Titration of HCl with NaOH
 - (B) Titration of CH_3COOH with NaOH
 - (C) Titration of $FeSO_4$ with $KMnO_4$
 - (D) All of these
- (9) Full name of BOD is
 - (A) Biochemical oxygen demand
 - (B) Biological oxygen demand
 - (C) Biometric oxygen demand
 - (D) None of the above
- (10) Full name of EDTA
 - (A) Ethylene diamine tetra-acetic acid
 - (B) Ethylene diamine try-acetic acid
 - (C) Ethylene dichloride tetra-acetic acid
 - (D) None of the above



- Q-2 Explain in detail types titration used in titrimetric analysis. [10]
OR
Q-2 Prove that the color change range, pH of the system is $\text{pH} = \text{pKIn} \pm 1$. [10]
Q-3 Explain in detail how will you determine hardness of water sample? [10]
OR
Q-3 Write a note on complexometric titration curve. [10]
Q-4 Derive Nernst equation and give one application. [10]
OR
Q-4 Explain the titration curve for ferrous (II) ion and cerium (IV) ion in detail. [10]
Q-5 What is water pollutant? Classify water pollutant and explain each of them. [10]
OR
Q-5 Explain method to analyze total dissolved solids and conductivity of water sample. [10]

