

Post Graduate Diploma in Analytical Chemistry (PGDAC)

MARCH EXAMINATION 2021

COURSE CODE: MCHL-001 COURSE TITLE: Basic Analytical Chemistry Lab
(Credits: 2)

Time: ½ Hour

Maximum Marks: 25

Please fill up the following particulars:

Enrolment No. in Figures

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Enrollment No. in Words

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Examination Centre Code

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Day and Date

Medium (English/Hindi).....

Name of
Examinee.....

Signature of Examinee.....

Signature of Invigilator.....

To be filled only by the Evaluator

Marks Obtained.....

Signature of the Evaluator.....

Name of the Evaluator.....

Evaluator Code:.....

Seal of Centre Superintendent
with Centre Code

Note for Examinee:

- i) This is an objective type question paper.
- ii) This question paper consists of 15 questions. **You have to attempt only 10 questions.** Each question carries 2½ marks.
- iii) Each question has four alternatives, only one of which is correct. Mark the correct alternative on the question paper itself by putting the tick mark V in the box given against it.

ON COMPLETION, IT IS COMPULSORY FOR YOU TO SUBMIT THIS QUESTION PAPER TO YOUR INVIGILATOR.

1. According to the law of probability,
 - i) Small errors occur with low frequency
 - ii) Small errors occur with high frequency
 - iii) Large errors occur with high frequency
 - iv) Small and large errors occur with same frequency
2. In the gravimetric determination of tin in brass the following steps are involved
 - i) Ignition of metastannic acid,
 - ii) Precipitation,
 - iii) Filtration and washing,

iv) Digestion

The correct order of these steps is

- i) I, II, III, IV
- ii) IV, II, III, I
- iii) II, IV, III, I
- iv) I, II, IV, III
3. In the gravimetric determination of nickel in steel the precipitation is done in
- i) Strongly acidic medium
- ii) Ammoniacal alkaline medium
- iii) Neutral medium
- iv) Weakly acidic medium
4. In the determination of pKa of orthophosphoric acid, the bromocresol green indicator end point and mixed indicator end point correspond to:
- i) Second and third stage of neutralisation respectively
- ii) First and second stage of neutralisation respectively
- iii) Second and first stage of neutralisation respectively
- iv) Third and second stage of neutralisation respectively
5. The alkalinity of water samples is expressed in terms of
- i) mg of CaCO_3 per dm^3
- ii) mg of Na_2CO_3 per dm^3
- iii) mg of NaHCO_3 per dm^3
- iv) mg of NaOH per dm^3
6. Which of the following types of indicators are used in complexometric titrations?
- i) Acid-base indicators
- ii) Redox indicators
- iii) Metallochromic indicators
- iv) Self-indicators
7. EDTA stands for
- i) Ethylenediamminetriacetic acid
- ii) Ethylenediamminetetraacetic acid
- iii) Ethanoldiamminetriacetic acid
- iv) Ethyldiamminetetraacetic acid
8. Titrimetric determination of ascorbic acid by iodine is an example of
- i) Complexometric titration
- ii) Precipitation titration
- iii) Redox titration
- iv) Acid base titration
9. Titrimetric determination of available chlorine in bleaching powder is an example of :
- i) Iodinometric titration
- ii) Iodometric titration
- iii) Iodimetric titration
- iv) Iodinometric titration
10. Available chlorine is :
- i) The free chlorine available in bleaching powder
- ii) The amount of chlorine made available by the action of water on bleaching powder
- iii) The amount of chlorine liberated by the action of a base on bleaching powder
- iv) The amount of chlorine liberated by the action of an acid on bleaching powder
11. In argentometric determination of halides, which of the following gives the correct combination of the method, indicator and indicator type:
- i) Mohr, Sodium chromate, adsorption

- ii) Mohr, Fluorescein, precipitation
- iii) Fajan, Fluorescein, adsorption
- iv) Fajan, Sodium chromate, precipitation

12. The indicator used in the precipitation titration of zinc with potassium ferrocyanide using internal indicator method is

- i) Fluorescein
- ii) Sodium chromate
- iii) Diphenylamine
- iv) Potassium ferricyanide

13. The standard deviation of a data is given by:

- i) $\sigma = \sqrt{\frac{1}{n} \sum_1^n (x_i - \bar{x})^2}$
- ii) $\sigma = \frac{1}{n} \sum_1^n (x_i - \bar{x})^2$
- iii) $\sigma = \frac{1}{n} \sum_1^n (\bar{x} - x_i)^2$
- iv) $\sigma = \frac{1}{n^2} \sum_1^n (x_i - \bar{x})^2$

14. In gravimetric determinations we measure

- i) The gravity of the analyte solution
- ii) The gravity of the precipitated analyte
- iii) The mass of precipitated analyte
- iv) The mass of the dried stable precipitate

15. Which of the following expressions is used to calculate the mass (m) in grams of a substance (of molar mass M_m) required to prepare V cm³ of a M molar standard solution?

- i) $m(\text{g}) = \frac{MV M_m}{100}$
- ii) $m(\text{g}) = \frac{M M_m}{1000 V}$
- iii) $m(\text{g}) = \frac{M V M_m}{1000}$
- iv) $m(\text{g}) = \frac{1000 M V}{M_m}$