



BRAINWARE UNIVERSITY

Library
Brainware University
398, Ramkrishnapur Road, Barasat,
Kolkata, West Bengal-700125

Term End Examination 2024-2025

Programme – Dip.CE-2024/Dip.CSE-2024/Dip.EE-2024/Dip.ME-2024/Dip.RA-2024

Course Name – Applied Chemistry

Course Code - DBS00003

(Semester I)

Full Marks : 60

Time : 2:30 Hours

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question)

1 x 15=15

1. Choose the correct alternative from the following :

- (i) In H-spectra, Lyman series belongs to
a) UV region
b) IR region
c) Visible region
d) Microwave region
- (ii) Shape of the p orbital is
a) Spherical
b) Dumb bell
c) Square
d) Elliptical
- (iii) In NH_4^+ ion number of covalent bonds and co-ordinate bonds are respectively
a) 3 and 1
b) 1 and 2
c) 3 and 0
d) 2 and 0
- (iv) The correct order of increasing bond angle is
a) $\text{sp}^3 < \text{sp}^2 < \text{sp}$
b) $\text{sp} < \text{sp}^2 < \text{sp}^3$
c) $\text{sp}^2 < \text{sp} < \text{sp}^3$
d) $\text{sp} < \text{sp}^3 < \text{sp}^2$
- (v) Hardness of water is measured in terms of ppm of equivalent of
a) CaCO_3
b) CaCl_2
c) NaCl
d) KCl
- (vi) The chemical equivalent of MgSO_4 salt is _____
a) 60
b) 47.5
c) 82
d) 68
- (vii) The colour obtained by adding EBT indicator to a sample of water containing Ca^{+2} and Mg^{+2} at pH = 9–10 is
a) Blue
b) Wine red
c) Orange
d) Black

(viii) Sterilization of water can be done by using

- a) H_2O_2
c) Cl_2
- (ix) The process of heat softening, moulding and cooling to rigidity can be repeated for which plastics?
a) Thermoplastics
c) Both Thermosetting And Thermoplastic
- (x) Which of the following is fully fluorinated polymer?
a) Neoprene
c) Teflon
- (xi) Limestone is the basic raw materials of
a) Paper industry
c) cement industry
- (xii) Which of the following is not a petroleum product?
a) Toluene
c) Kerosene
- (xiii) Quality of diesel fuel is determined by
a) octane rating
c) length of the hydrocarbon chain
- (xiv) The tendency of knocking in an internal combustion engine is highest in
a) aromatics
c) straight chain hydrocarbons
- (xv) Chemical added to detect leakage of LPG from cylinder is
a) Hydrogen sulfide
c) Marsh gas
- b) O_2
d) NaOH
- b) Thermosetting Plastics
d) Artificial Plastic
- b) PVC
d) Thiokol
- b) textile industry
d) sugar industry
- b) Neoprene
d) Gasoline
- b) percentage of carbon
d) Cetane number
- b) cycloparaffins
d) olefins
- b) Methyl mercaptan
d) Cool gas

Group-B

(Short Answer Type Questions)

$$3 \times 5 = 15$$

2. Name the compound that shows all three types of bonding (ionic, covalent, and coordinate bonding). Explain with a suitable diagram. (3)
3. Define the carbonization of coal. Identify the products obtained from the carbonization of the coal sample. (3)
4. Write the composition of cement. (3)
5. Give examples of salts that are responsible for temporary and permanent hardness. (3)
6. On electrolysis of CuSO_4 solution using Pt-electrode, estimate the number of Cu-atoms that will be deposited on passing one Faraday of electricity. (3)

OR

Predict the appropriate electrodes and electrolytes used during electroplating of a metal (3) with copper.

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Group-C
(Long Answer Type Questions)

5 x 6=30

7. Illustrate different products obtain from fractional distillation of crude oil. (5)
8. (5)
- a) "Al can not be extracted by carbon reduction process". Explain the statement with proper justification.
- b) Differentiate between clacination and roasting with suitable examples.
9. State Bohr's postulates of the atomic model. (5)
10. a) Define the molarity of a solution. (5)
- b) To prepare 2 (N) NaOH solution, how much amount of NaOH is required in 1000 ml of water?
11. a) What is the full form of EDTA? (5)
- b) What is the unit of hardness measurement?
- c) Explain the Permutit process of hardness removal.
12. Predict the cell reaction of the lead storage battery during the charging and discharging with the cell diagram. (5)

OR

HNO_2 can act as an oxidant as well as reductant while HNO_3 only as oxidant. Justify (5) the statement.
