

(6 pages)

Reg. No. :

Code No. : 30483 E Sub. Code : CACH 11

B.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2024

First/Third Semester

Chemistry — Allied

ALLIED CHEMISTRY — I

(For those who joined in July 2021 and 2022 only)

Time : Three hours

Maximum : 75 marks

SECTION A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer.

1. Select the molecule which has sp hybridisation

- (a) $BeCl_2$ (b) PCl_3
(c) BF_3 (d) NH_3

2. Illustrate the shape of p orbital

- (a) Elliptical (b) Dumb-bell
(c) Spherical (d) Tetrahedron

3. Select the name of the reaction which involves the conversion of methyl ethyl ketoxime into N -Methylpropionamide

- (a) Addition reaction
(b) Elimination reaction
(c) Rearrangement reaction
(d) Polymerisation reaction

4. Illustrate the ion which acts as a nucleophile

- (a) $AlCl_3$ (b) NO_2^+
(c) CN^- (d) I^+

5. Identify the value that at critical temperature, the value of surface tension falls to _____.

- (a) zero (b) one
(c) five (d) two

6. Select the example from the following for the surface active agents

- (a) methanol (b) ethanol
(c) acetic acid (d) all of them

7. Predict the type of glass which has the composition of silica 75%, sodium oxide 15%, CaO 8% and Al_2O_3 2%
- (a) Jena glass (b) Soda glass
(c) Pyrex glass (d) Flint glass
8. Identify the explosive substance(s) from the following
- (a) RDX (b) TNT
(c) Nitroglycerine (d) All of them
9. Predict name of the disease that causes abnormal growth of cells
- (a) AIDS (b) Diabetes
(c) Cancer (d) Fever
10. Choose the drug which is not used as analgesics
- (a) aspirin (b) cis-platin
(c) ibuprofen (d) acetaminophen

SECTION B — (5 × 5 = 25 marks)

Answer ALL questions choosing either (a) or (b).
Each answer should not exceed 250 words.

11. (a) Explain the four types of quantum numbers.
- Or
- (b) Analyse the two types of hydrogen bonding with suitable examples.

Page 3 Code No. : 30483 E

12. (a) Illustrate briefly the concept of nucleophiles and electrophiles with suitable examples.

Or

- (b) Explain in details the substitution and elimination reactions with suitable examples.

13. (a) Derive the expression for pressure of a gas on the basis of kinetic theory.

Or

- (b) Distinguish between gaseous and liquid states.

14. (a) Explain briefly preparation of RDX, nitrocellulose and lead azide.

Or

- (b) Describe the major constituents and manufacture of cement by Dry process.

15. (a) Analyse the cause of treatment of AIDS.

Or

- (b) Judge the preparation, uses and mode of action of prontosil and sulphadiazine.

Page 4 Code No. : 30483 E

[P.T.O.]

SECTION C — (5 × 8 = 40 marks)

Answer ALL questions choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Analyse the hybridisation of sp^2 and sp^3 with suitable examples. Write their geometry.

Or

- (b) Describe briefly the MO diagrams of F_2 and O_2 molecules.

17. (a) Differentiate briefly the carbonium ions and carbanions. How are they prepared? Explain any two properties of them.

Or

- (b) (i) Differentiate between homolytic and heterolytic cleavage with suitable examples.

- (ii) Analyse the polymerisation reaction with suitable example. (5 + 5)

18. (a) Explain real and ideal gases. How are real gases deviated from ideal behaviour? Discuss the reason for deviations.

Or

Page 5 Code No. : 30483 E

- (b) (i) Define the terms surface tension and surface energy.

- (ii) Define the term viscosity. Discuss the effect of temperature on the viscosity of a liquid.

- (iii) Discuss the significance of Trouton's rule. (3 + 5 + 2)

19. (a) Discuss the manufacture of glass.

Or

- (b) Explain the various types of glasses and their specific uses.

20. (a) Summarise the cause and treatment of diabetes and cancer.

Or

- (b) Select one example and define the following : (4 + 3 + 3)

- (i) Local and general anaesthetics

- (ii) Anticancer drugs

- (iii) Analgesics.

Page 6 Code No. : 30483 E