KAMARAJ COLLEGE (Autonomous)

Accredited with A+ Grade by NAAC

(Affiliated to Manonmaniam Sundaranar University, Tirunelveli)

(3 Pages) **Reg. No:……**

Question Code: 26E00312 **Course Code : 24UECH41**

UG Degree - End Semester Examinations, April 2026

Fourth Semester

CHEMISTRY ALLIED

Allied Chemistry Paper-II

(For those who joined in July 2024 onwards)

Time : 3Hours **Maximum : 75 Marks**

PART – A (10 × 1 = 10 Marks)

Answer ALL Questions

Choose the correct answer :

CO:1 K: 3 1. The coordination number of Ni in the complex $[Ni(CN)_4]^{2-}$ is _____

(a) 2 (b) 3

(c) 5 (d) 4

CO:1 K:2 2. The ligand used for the conversion of hard water to soft water is _____

(a) CN (b) Br

(c) EDTA (d) en

CO:2 K:2 3. Pick out the trisaccharide from the following:

(a) raffinose (b) sucrose

(c) starch (d) stachyose

CO:2 K:2 4. Which one of the following amino acids contain sulphur

(a) glycine (b) phenylalanine

(c) serine (d) cysteine

CO:3 K:1 5. Name the negative catalyst in the given reaction

(a) ethanol (b) bromine

(c) Pt (d) Zn

CO:3 K:1 6. The heterogeneous catalyst used in the manufacture of ammonia by Haber's process is _____

(a) Ni (b) Fe

(c) I_2 (d) V_2O_5

CO:4 K:1 7. Which of the following material is used as artificial sweetening agent?

(a) saccharin (b) cinnamaldehyde

(c) benzaldehyde (d) methyl salicylate

CO:4 K:1 8. Pick out the preservative from the following chemicals

(a) propylene glycol esters (b) sorbitan esters

(c) Sodium metabisulphite (d) titanium oxide

CO:5 K:1 9. The phenomenon of fluorescence is observed in _____

(a) solids (b) liquids

(c) gases (d) all the above

CO:5 K:2 10. According to Stark- Einstein's law of photochemical equivalence, each molecule taking part in a photochemical reaction absorb _____ quantum of radiation.

(a) one (b) two

(c) three (d) four

PART – B (5 X 5 = 25 Marks)

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

Answer should not exceed 250 words.

CO:1 K:3 11. (a) Apply Pauling's theory to $[Ni(CO)_4]$ complex and predict the type of hybridization and magnetic moment.

(OR)

(b) Apply the principle of complex formation in qualitative analysis of metal ions.

CO:2 K:4 12. (a) Explain the open chain ring structure of glucose.

(OR)

(b) Explain the preparation and properties of alanine.

CO:3 K:3 13. (a) List out the general characteristics of catalytic reactions.

(OR)

(b) Write notes on autocatalysis.

CO:4 K:3 14. (a) List the functions of food additives.

(OR)

(b) Define food flavours. Explain its importance.

CO:5 15. (a) Explain the characteristics of fluorescence.

K:4

(OR)

(b) Explain the characteristics of phosphorescence.

PART – C (5 X 8 = 40 Marks)

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

Answer should not exceed 500 words.

CO:1 K:4 16. (a) Explain the role of haemoglobin and chlorophyll in biological systems.

(OR)

(b) i) Explain zeolite process of purification of hard water.

ii) Explain the method of determination of hardness of water using EDTA method.

CO:2 K:4 17. (a) Discuss the properties of fructose and sucrose.

(OR)

(b) Discuss the properties of starch and cellulose.

CO:3 K:5 18. (a) Explain the following

i)Intermediate compound formation theory

ii)Adsorption theory

(OR)

(b) Derive Michaelis–Menten equation for single-substrate enzyme kinetics.

CO:4 K:4 19. (a) i) Explain the principles of food preservation.

ii)Write notes on AGMARK.

(OR)

(b) Write notes on i) antioxidants ii) acid modifiers iii) foaming agents.

CO:5 K:5 20. (a) Derive an expression for quantum yield for the photochemical combination of H_2 and Cl_2

(OR)

(b) Define photosensitization and illustrate how the process of photosensitization helps in initiating chemical reactions.