5m/CHE-302 Syllabus-2023

2025

(Nov–Dec)

FYUP : 5th Semester Examination

MINOR

CHEMISTRY

(Chemistry—III)

CHE-302

(Part-A : Theory)

Marks : 56

Time : 3 hours

The figures in the margin indicate full marks for the questions

UNIT—I

(Inorganic)

(*Marks* : 19)

1. *(a)* What is Portland cement? Name the raw materials required for the manufacture of cement. 2

(b) What are the essential qualities of a good fertilizer? 2

(c) Briefly describe the manufacture and uses of urea. 2

(d) Explain the essential components of paints and their functions. 2

OR

2. (a) Discuss the different types of pigments with example. 2

(b) What are the merits and demerits of using superphosphate of lime as fertilizer? 2

(c) Discuss the role of water and gypsum during setting of cement. 2

(d) Write a note on NPK fertilizer. 2

3. (a) What are primary and secondary air pollutants? Explain how peroxyacetyl nitrate (PAN) is generated in the atmosphere. 2

(b) Name the sources that caused water pollution. How can phosphatic waste be reduced? 2

(c) What are pesticides? How do they affect the environment? 2

(d) Name few sources of soil pollution. 1

(e) Write short notes on any *two* of the following : 2×2=4

(i) Photochemical smog

(ii) Acid rain

(iii) Greenhouse effect

OR

4. (a) Give a brief account of particulate pollution. How can this be checked? 2

(b) Describe the effect of freons on environment. 2

(c) What are organic and inorganic pollutants? Give examples. 1½+1½=3

(d) What are industrial effluents? How do they affect the water bodies? 2

(e) What is Minamata disease? 2

UNIT—II

(Organic)

(*Marks* : 19)

5. (a) What are antipyretic drugs? Give its classification with appropriate examples. 1+2=3

(b) Write a method for the preparation of aspirin. What is the common side effect of aspirin? 2+1=3

OR

6. (a) Elucidate the differences between an antiseptic and a disinfectant. Give an example of each. 2+1=3

(b) How is paracetamol synthesized from *p*-nitrophenol? Mention its uses. 2+1=3

7. (a) What is the difference between saturated and unsaturated fats? 2

(b) Define iodine value. What does a high iodine value indicate? 2

(c) Explain the mechanism of the cleansing action of soap. 2

OR

8. (a) What is saponification value? Give its significance. 1½

(b) How are detergents superior to soaps? 1½

(c) Write short notes on the following : 1½×2=3

(i) RM value

(ii) Hardening of oil

9. (a) Define chromophore and auxochrome. Illustrate with suitable examples. 3

(b) How are dyes classified based on their structure? 2

(c) Indicate the structural changes of phenolphthalein involved in acid and alkaline medium. 2

OR

10. (a) What are the characteristics of a good dye? 2

(b) Outline the synthesis of Bismark-brown. 2

(c) How will you classify dyes based on their applications? 3

UNIT—III

(Physical)

(*Marks* : 18)

11. (a) State Gibbs' phase rule and explain the various terms involved. 1+1=2

(b) Calculate the degrees of freedom of the following : 1×2=2

(i) $CaCO_3(s) \rightleftharpoons CaO(s) + CO_2(g)$

(ii) Aqueous solution of glucose

(c) Draw the labelled phase diagram of water system and discuss the various points, lines and areas. 4

(d) Explain the following with examples : 1½×2=3

(i) Partially miscible liquids

(ii) Azeotropic mixtures

(e) State Nernst distribution law. Mention two of its applications. 2+2=4

(f) Write a note on fractional distillation. 3

OR

12. (a) Give a labelled phase diagram of two-component system involving congruent melting point taking phenol-aniline system as an example. 4

(b) What is condensed system? Write the reduced phase rule. 1+1=2

(c) Define eutectic and incongruent melting points. 1+1=2

(d) What is critical solution temperature? Explain with the help of an example a system having both upper and lower critical solution temperatures. 1+2=3

(e) Briefly discuss steam distillation. 2

(f) Describe the different phases of CO_2 system using a labelled phase diagram. 3

(g) What are conjugate solutions? 2

★★★