

5m/CHE-302 Syllabus-2023

2 0 2 5

(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

26D/801

(Turn Over)

(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
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- 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

(3)

- (d) Name few sources of soil pollution. 1
- (e) Write short notes on any *two* of the following : $2 \times 2 = 4$
- (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. $1\frac{1}{2} + 1\frac{1}{2} = 3$
- (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. $1 + 2 = 3$

(4)

- (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. $1\frac{1}{2}$

- (b) How are detergents superior to soaps? $1\frac{1}{2}$

- (c) Write short notes on the following : $1\frac{1}{2} \times 2 = 3$

(i) RM value

(ii) Hardening of oil

(5)

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) $\text{CaCO}_3(\text{s}) \rightleftharpoons \text{CaO}(\text{s}) + \text{CO}_2(\text{g})$
- (ii) Aqueous solution of glucose

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(Turn Over)

(6)

- (c) Draw the labelled phase diagram of water system and discuss the various points, lines and areas. 4
- (d) Explain the following with examples : $1\frac{1}{2} \times 2 = 3$
- (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. $1+2=3$

(7)

- (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
