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Reg. No. : .....

Code No. : 20620 E Sub. Code : EECH 12/  
FECH 12

B.Sc. (CBCS) DEGREE EXAMINATION,  
APRIL 2025.

First/Third Semester

Chemistry

Elective — CHEMISTRY FOR BIOLOGICAL  
SCIENCES — I

(For those who joined in July 2023 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Which of the following pair corresponds to isotones?

(a)  ${}_6\text{C}^{13}$  and  ${}_6\text{C}^{14}$  (b)  ${}_{14}\text{Si}^{30}$  and  ${}_{16}\text{S}^{32}$

(c)  ${}_{15}\text{P}^{30}$  and  ${}_{16}\text{S}^{32}$  (d)  ${}_2\text{He}^3$  and  ${}_2\text{He}^4$

2. The bond order of Hydrogen molecule is \_\_\_\_\_.

(a) 4 (b) 3

(c) 2 (d) 1

3. Producer gas is a mixture of \_\_\_\_\_.

(a) CO and  $\text{N}_2$  (b)  $\text{CO}_2$  and  $\text{N}_2$

(c) CO and  $\text{H}_2$  (d) CO and  $\text{O}_2$

4. Which is the major component of LPG?

(a) Butane (b) Propane

(c) Ethane (d) Methane

5. The number of  $\pi$ -electrons present in azulene molecule is \_\_\_\_\_.

(a) 6 (b) 2

(c) 10 (d) 14

6. Pyrrole is a

(a) strong base (b) weak base

(c) strong acid (d) weak acid

7. Chemical formula of Freon is

- (a)  $\text{CHCl}_2 = \text{CHCl}_2$  (b)  $\text{CCl}_2\text{F}_2$   
(c)  $\text{CH}_2 = \text{CH} - \text{CH}_2\text{Cl}$  (d)  $\text{CH}_2 = \text{CH} - \text{Cl}$

8. Aspirin is

- (a) methyl salicylate  
(b) sodium salicylate  
(c) P-amino phenol derivative  
(d) acetyl salicylic acid

9. Which of the following is correct about volumetric analysis?

- (a)  $N_2 = \frac{V_1 \times N_2}{V_2}$  (b)  $N_2 = \frac{V_2}{V_1 \times N_1}$   
(c)  $N_2 = \frac{V_1 \times N_1}{V_2}$  (d)  $N_1 = \frac{V_1 \times N_2}{N_2}$

10. Which one among the following is used as the adsorbent in thin layer chromatography?

- (a) Silica gel (b) Cellulose  
(c) Both (a) and (b) (d) None

PART B — (5 × 5 = 25 marks)

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

Each answer should not exceed 250 words.

11. (a) Write any five applications of radioactive isotopes.

Or

(b) Draw the MO diagram of  $\text{N}_2$  molecule.

12. (a) How are the following prepared? Give two uses each

- (i) Producer gas  
(ii) Water gas.

Or

(b) (i) What are mixed fertilizers? Give examples.

(ii) How is triple super phosphate manufactured? Write its uses.

13. (a) Explain the hybridization and geometry of  $\text{CH}_4$ .

Or

(b) Give any two methods of synthesis of Pyrrole.

14. (a) Define antibiotics. Give the structure and uses of Penicillin.

Or

(b) What are called artificial sweetness? Name any two of them. Mention their uses.

15. (a) Explain the principle of volumetric analysis.

Or

(b) Mention any five applications of column chromatography.

PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) Explain the following :

(i) Stellar energy

(ii) Nuclear fission.

Or

(b) Write notes on

(i) Group displacement law

(ii) Differences between bonding and antibonding molecular orbitals.

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17. (a) Write the preparation and uses of the following.

(i) CNG

(ii) LPG

(iii) Urea.

Or

(b) Explain the synthesis, properties and uses of silicones.

18. (a) Explain the following reactions.

(i) Friedel-Crafts alkylation

(ii) Hantzsch-Pyridine synthesis.

Or

(b) Explain the hybridization and geometry of  $C_2H_2$  and  $C_6H_6$ .

19. (a) Write the structure and uses of the following.

(i) Aspirin

(ii) Paracetamol

(iii) Ibuprofen.

Or

(b) Discuss the preparation and uses of Freon and Teflon.

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20. (a) Discuss the principle and applications of
- (i) Paper chromatography
  - (ii) Thin layer chromatography.

Or

- (b) Write notes on :
- (i) Distillation
  - (ii) Crystallization.
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