

(7 pages)

Reg. No. : .....

Code No. : 20012 E Sub. Code : SACH 11/  
AACH 11

B.Sc. (CBCS) DEGREE EXAMINATION,  
NOVEMBER 2023.

First/Third Semester

Chemistry — Allied

ALLIED CHEMISTRY

(For those who joined in July 2017–2020)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. The electronic configuration of Nitrogen (At. No. 7) atom is
- (a)  $1s^2 2s^2 2p_x^2 2s^1$  (b)  $1s^2 2s^2 2p_x^1 2p_y^1 2p_z^1$   
(c)  $1s^2 2s^2 2p_x^2 2p_y^1$  (d)  $1s^2 2s^2 2p_x^1 2p_z^2$

6. Which of the following law governing photochemical reaction?
- (a) Henry's law (b) Stark-Einstein law  
(c) Raoult's law (d) Faraday's law
7. Select the correct plastic polymer among the following
- (a) Nylon (b) Terelene  
(c) Poly-styrene (d) Orlon
8. Phenol-formaldehyde resin is
- (a) Polyvinyl chloride (b) Nylon  
(c) Bakelite (d) Shellac
9. The raw material used to make chalkpieces is
- (a) Starch (b) Calcium carbonate  
(c) Gypsum (d) None of these
10. The type of grease used in airplanes is
- (a) Lime based grease  
(b) Soda-based grease  
(c) Lithium based grease  
(d) Axle grease

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2. Hybridisation in  $SF_6$  molecule is
- (a)  $d^2sp^3$  (b)  $sp^3d^2$   
(c)  $sp^2d^3$  (d)  $sp^3d$

3. Which one is a nucleophile?
- (a)  $H^+$  (b)  $OH^-$   
(c)  $BF_3$  (d)  $SO_3$

4. The most stable carbonium ion is



- (c)  $\overset{+}{C}H_3$  (d)  $R-\overset{+}{C}H_2$

5. Emission of light due to chemical reaction is known as
- (a) Thermoluminescence  
(b) Chemiluminescence  
(c) Bioluminescence  
(d) Fluorescence

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PART B — (5 × 5 = 25 marks)

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

Each answer should not exceed 250 words.

11. (a) Explain the types of hydrogen bonding with suitable example.  
Or  
(b) How is ionic bond formed? Write down the favourable conditions for it.
12. (a) Classify the following as electrophiles and nucleophiles  
 $H_3O^+$ ,  $NH_3$ ,  $Cl^+$ ,  $H_2O$ ,  $BF_3$ ,  $OH^-$ ,  $SO_3$ ,  $NO_3^-$ ,  
 $R^+$ ,  $Br^-$ .  
Or  
(b) Give any two methods of preparation of carbonium ions with suitable chemical reactions.
13. (a) Bring out the differences between thermochemical reactions and photochemical reactions.

Or

- (b) What is meant by quantum yield? Explain briefly.

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[P.T.O.]



14. (a) How is polypropylene prepared? Write its uses.

Or

(b) Write notes on :

- (i) Homo polymers
- (ii) Co polymers
- (iii) Alternating co polymers
- (iv) Random co polymers.

15. (a) Mention the various ingredients used in the preparation of tooth powder.

Or

- (b) (i) Write down the advantages of solid lubricants.
- (ii) Name any two solid lubricants.

PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) Write down the postulates of VSEPR theory.

Or

- (b) Explain  $sp$ ,  $sp^2$  and  $sp^3$  hybridisation with example.

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20. (a) (i) Viscosity index  
(ii) Flash point  
(iii) Cloud point  
(iv) Oiliness.

Or

- (b) How are the following products prepared?
  - (i) Shampoo
  - (ii) Nail polish
  - (iii) Chalk pieces.

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17. (a) (i) Explain homolytic and heterolytic cleavage with suitable example.

(ii) Write short notes on free radicals.

Or

- (b) Explain the following reaction with example.
  - (i) Addition reactions
  - (ii) Elimination reaction
  - (iii) Substitution reaction.

18. (a) Explain the following laws

- (i) Grothus – draper's law
- (ii) Stark – instein's law
- (iii) Beer lambert's law.

Or

- (b) Explain the following terms with example
  - (i) Bioluminescence
  - (ii) Thermoluminescence
  - (iii) Chemiluminescence.

19. (a) How is nylon 6,6 manufactured? Give three uses of it.

Or

- (b) (i) How is epoxy resin prepared?
- (ii) Mention the drawbacks of natural rubber.

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