CHEM/V/CC/15b

Student's Copy

2023

(CBCS)

(5th Semester)

CHEMISTRY

EIGHTH (B) PAPER

(Industrial Chemistry)

Full Marks : 75

Time : 3 hours

The figures in the margin indicate full marks for the questions

(SECTION : A-OBJECTIVE)

(Marks: 10)

Tick (\checkmark) the correct answer in the brackets provided :

1×10=10

1. The highest percentage of nitrogen is found in

- (a) urea ()
- (b) calcium ammonium nitrate ()
- (c) ammonium sulphate ()
- (d) ammonium nitrate ()

2. Jena/Xena glass is basically composed of

- (a) zinc and calcium silicates ()
- (b) borosilicates ()
- (c) zinc and aluminosilicates ()
- (d) zinc and barium borosilicates ()

3. Which one of the following compounds acts as oxidizer in gunpowder?

- (a) Charcoal ()
- (b) Sulphur ()
- (c) HNO₃ ()
- (d) KNO₃ ()

4. Raw skins can be preserved from the action of bacteria by

- (a) pruning ()
- (b) brine curing ()
- (c) soaking ()
- (d) tanning ()

5. The main purpose of coal gasification is for the production of

- (a) producer gas ()
- (b) water gas ()
- (c) syngas ()
- (d) oil gas ()

6. The process of conversion of kerosene oil to oil gas is known as

- (a) cracking ()
- (b) knocking ()
- (c) reforming ()
- (d) blowing ()

7. Control of water activity in foods preservation can be achieved by

- (a) blanching ()
- (b) extrusion cooking ()
- (c) irradiation ()
- (d) solute preservation ()

- 8. Fermentation technology is an energy-generation process in which organic compounds act as
 - (a) electron donor ()
 - (b) electron acceptor ()
 - (c) Both the processes ()
 - (d) proton donor ()
- 9. The formula of polymethyl methacrylate or plexiglass is



10. Polymer synthesized by ring-opening polymerization of caprolactam is

- (a) Nylon 6,6 ()
- (b) Nylon 6 ()
- (c) Teflon ()
- (d) Kevlar ()

| Contd.

(SECTION : B-SHORT ANSWERS)

(Marks: 15)

Answer the following :

Unit—I

What is hydration of cement?

OR

2. What is soda-lime silicate glass? Why is it called soft glass?

Unit—II

3. Write two methods of tannery effluents treatment processes.

OR

4. How does lead azide manufacture? Write the reaction involved. Why is it used as an explosive?

Unit—III

5. What is meant by 'allothermal process' of coal gasification?

OR

6. Write the importance of ultimate analysis of coal.

Unit—IV

7. What are food colorants? Cite two naturally occurring pigments that are used in foods.

OR

8. Write a short note on microbial biomass.

Unit—V

9. Write the differences between thermosetting and thermoplastic polymers. Give suitable examples.

OR

10. Give an account of the role of textile designers.

/114

3×5=15

(SECTION : C-DESCRIPTIVE)

(Marks : 50)

Answer the following :

10×5=50

Unit—I

1.	(a)	What are bio-fertilizers? Mention their importance for the healthy growth of plants.	3
	(b)	How will you classify the different types of nitrogenous fertilizer?	3
	(c)	Explain the reactions involved in the process of setting and hardening of cement.	4
		OR	
2.	(a)	What are the main functions of silicon oxide in glass?	3
	(b)	Discuss the composition and properties of hard glass.	4
	(c)	Write the chemical reaction for the manufacture of ammonium sulphate.	3
		Unit—II	
3	. (a) What is tanning of animal hides or skin? What are its advantages?	4
	(b) How is cordite manufactured? Why is it used as an explosive?	3
	(0) Describe the preparation of lead azide, $Pb(N_3)_2$.	3
		UK (
	4 . (c	 What do you mean by de-hairing of leather? Write the reaction(s) involved for de-hairing process. 	4
	(b) What are propellants? Write down the working principle of propellant.	3
	(c) How do you prepare TNT from toluene?	3
		с. э	

/114

[Contd.

UNIT-III

- 5. (a) Distinguish between water gas and producer gas.
 - (b) What is synthetic petrol? Write the reaction(s) involved in its manufacture.
 - (c) Discuss the importance of octane number.

OR

- 6. (a) What are coal tar-based chemicals? How are they produced?
 - (b) Write a brief note on the economic importance of coal.
 - (c) Differentiate between reforming and cracking process in petrol.

UNIT-IV

- 7. (a) Write a descriptive note on minor components of food.
 - (b) Discuss, in detail, all the different component parts of a fermentation process.

OR

- **8.** (a) What are the different types of unit operation in food technology? Explain in brief.
 - (b) What are polysaccharides? Mention their three main functions in animals and plants.
 - (c) Write a brief note on process optimization of fermentation.

UNIT-V

- 9. (a) What are polyethylenes? Explain LDPE and HDPE, and write two uses of each type.
 (b) How do you obtain Teflon? Write its two uses.
 - (c) Write the monomers of the following :
 - (i) Polystyrene
 - (ii) PMMA
 - (iii) Terylene
 - (iv) Polyurethane

1/2×4=2

4

3

3

- 10. (a) What is textile design?
 - (b) What do you understand by timing in textile designing? On what factors does it depend? 3
 - (c) Write the preparation and two uses of any two of the following : $3 \times 2=6$
 - (i) Nylon 6,6
 - (ii) Terylene
 - (iii) PEA
 - (iv) Bakelite

1

CHEM/V/CC/15b

Student's Copy

2023

(CBCS)

(5th Semester)

CHEMISTRY

EIGHTH (B) PAPER

(Industrial Chemistry)

Full Marks : 75

Time : 3 hours

The figures in the margin indicate full marks for the questions

(SECTION : A-OBJECTIVE)

(Marks: 10)

Tick (\checkmark) the correct answer in the brackets provided :

1×10=10

1. The highest percentage of nitrogen is found in

(a) urea ()

(b) calcium ammonium nitrate ()

(c) ammonium sulphate ()

(d) ammonium nitrate ()

/114

[Contd.

2. Jena/Xena glass is basically composed of

- (a) zinc and calcium silicates ()
- (b) borosilicates ()
- (c) zinc and aluminosilicates ()
- (d) zinc and barium borosilicates ()

)

)

3. Which one of the following compounds acts as oxidizer in gunpowder?

- (a) Charcoal ()
- (b) Sulphur (
- (c) HNO₃ (
- (d) KNO_3 ()

4. Raw skins can be preserved from the action of bacteria by

- (a) pruning (
- (b) brine curing ()
- (c) soaking ()
- (d) tanning ()

5. The main purpose of coal gasification is for the production of

- (a) producer gas ()
- (b) water gas ()
- (c) syngas ()
- (d) oil gas ()

6. The process of conversion of kerosene oil to oil gas is known as

- (a) cracking ()
- (b) knocking ()
- (c) reforming ()
- (d) blowing ()

7. Control of water activity in foods preservation can be achieved by

- (a) blanching ()
- (b) extrusion cooking ()
- (c) irradiation ()
- (d) solute preservation ()

- 8. Fermentation technology is an energy-generation process in which organic compounds act as
 - (a) electron donor ()
 - (b) electron acceptor ()
 - (c) Both the processes ()
 - (d) proton donor ()
- 9. The formula of polymethyl methacrylate or plexiglass is



10. Polymer synthesized by ring-opening polymerization of caprolactam is

- (a) Nylon 6,6 ()
- (b) Nylon 6 ()
- (c) Teflon ()
- (d) Kevlar ()

/114

Cont

(SECTION : B-SHORT ANSWERS)

(Marks: 15)

Answer the following :

Unit—I

What is hydration of cement?

OR

2. What is soda-lime silicate glass? Why is it called soft glass?

UNIT—II

3. Write two methods of tannery effluents treatment processes.

OR

4. How does lead azide manufacture? Write the reaction involved. Why is it used as an explosive?

Unit—III

5. What is meant by 'allothermal process' of coal gasification?

OR

6. Write the importance of ultimate analysis of coal.

UNIT-IV

7. What are food colorants? Cite two naturally occurring pigments that are used in foods.

OR

8. Write a short note on microbial biomass.

UNIT-V

9. Write the differences between thermosetting and thermoplastic polymers. Give suitable examples.

OR

10. Give an account of the role of textile designers.

/114

| Contd.

3×5=15

(SECTION : C-DESCRIPTIVE)

(Marks : 50)

Answer the following :

Unit—I

1.	(a)	What are bio-fertilizers? Mention their importance for the healthy growth of plants.	3					
	(b)	How will you classify the different types of nitrogenous fertilizer?	3					
	(c)	Explain the reactions involved in the process of setting and hardening of cement.	4					
		OR						
2.	(a)	What are the main functions of silicon oxide in glass?	3					
	(b)	Discuss the composition and properties of hard glass.	4					
	(c)	Write the chemical reaction for the manufacture of ammonium sulphate.	3					
Unit—II								
3	. (a)	What is tanning of animal hides or skin? What are its advantages?	4					
	(b) How is cordite manufactured? Why is it used as an explosive?	3					
	(c) Describe the preparation of lead azide, $Pb(N_3)_2$. OR	3					
4	. (a	a) What do you mean by de-hairing of leather? Write the reaction(s) involved for de-hairing process.	4					
	(l	b) What are propellants? Write down the working principle of propellant.	3					
	(0	c) How do you prepare TNT from toluene?	3					

[Contd.

10×5=50

* *-

.

		Unit—III	
5.	(a)	Distinguish between water gas and producer gas.	
	(b)	What is synthetic petrol? Write the reaction(s) involved in manufacture.	its
	(c)	Discuss the importance of octane number.	3
		OR	3
6.	(a)	What are coal tar-based chemicals? How are they produced?	3
	(b)	Write a brief note on the economic importance of coal.	й Э
	(c)	Differentiate between reforming and cracking process in petrol.	4
		Unit—IV	
7.	(a)	Write a descriptive note on minor components of food.	5
	(b)	Discuss, in detail, all the different component parts of a fermentatio process.	n 5
		OR	0
8.	(a)	What are the different types of unit operation in food technology Explain in brief.	? 4
	(b)	What are polysaccharides? Mention their three main functions in animals and plants.	n 3
	(c)	Write a brief note on process optimization of fermentation.	3
		UNITV	
9.	(a)	What are polyethylenes? Explain LDPE and HDPE, and write two uses of each type.	5
	(b)	How do you obtain Teflon? Write its two uses	3
	(c)	Write the monomers of the following :	4=2
		(i) Polystyrene	
	(ii) PMMA	
	(i	ii) Terylene	
	(i	v) Polyurethane	

[Contd.

10. (a) What is textile design?

- (b) What do you understand by timing in textile designing? On what factors does it depend?
- (c) Write the preparation and two uses of any two of the following : $3 \times 2=6$
 - (i) Nylon 6,6
 - (ii) Terylene
 - (iii) PEA
 - (iv) Bakelite

1