

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER-IV (NEW) EXAMINATION – WINTER 2020****Subject Code:3140508****Date:17/02/2021****Subject Name:Unit Processes & Chemical Technology****Time:02:30 PM TO 04:30 PM****Total Marks:56****Instructions:**

1. Attempt any **FOUR** questions out of **EIGHT** questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) What are antibiotics? Give two examples. **03**
(b) Discuss the classification of dyes in detail. **04**
(c) With a neat process flow diagram, describe the process of manufacturing of sugar. **07**
- Q.2** (a) State the uses and applications of urea. **03**
(b) With a suitable illustration, explain cracking. **04**
(c) Describe the production of nitrobenzene by nitration of benzene with a neat process flow diagram. Also discuss the mechanism of reaction. **07**
- Q.3** (a) What are vitamins? State their importance. **03**
(b) Briefly explain the classification of drugs and pharmaceuticals. **04**
(c) With a neat process flow diagram, describe the process of manufacturing of penicillin. **07**
- Q.4** (a) Define PVC of paints. What is its significance? **03**
(b) Briefly describe the manufacturing of paper. **04**
(c) Describe the pulp manufacturing by Kraft process. Also explain how it is different from sulfite process. **07**
- Q.5** (a) What do you understand by C1, C2 and C3 chemicals? Explain. **03**
(b) Briefly discuss about the important properties of petroleum products. **04**
(c) Write short notes on processing of petroleum and treatment techniques. **07**
- Q.6** (a) What is refractory? State its types. **03**
(b) Briefly explain the settling and hardening of cement. **04**
(c) With a neat schematic diagram, explain the manufacturing of cement by wet process. **07**
- Q.7** (a) State the advantages of membrane cell over mercury cell. **03**
(b) Briefly describe the manufacturing of sodium bicarbonate. **04**
(c) With a neat process flow diagram, describe the manufacture of caustic soda and chlorine by membrane cell process. **07**
- Q.8** (a) What is absolute alcohol? State the uses of industrial alcohol. **03**
(b) Briefly explain the manufacture of citric acid by fermentation process. **04**
(c) Write short notes on varnishes and industrial coatings. **07**

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-IV (NEW) EXAMINATION – WINTER 2021****Subject Code:3140508****Date:24/12/2021****Subject Name:Unit Processes & Chemical Technology****Time:10:30 AM TO 01:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

		MARKS
Q.1	(a) Define the term pigment. Briefly describe their types.	03
	(b) Write a note on types of refractory materials and their applications.	04
	(c) Explain diaphragm and membrane cell process for production of chlorine.	07
Q.2	(a) Why Friedel-Craft alkylation of nitrobenzene is disfavoured?	03
	(b) Discuss the mechanism for alkylation of chlorobenzene.	04
	(c) Discuss continuous nitration with fortified spent-acid process for manufacturing of nitrobenzene from benzene.	07
	OR	
	(c) Describe the mechanistic view for alkylation of phenol to ortho cresol, meta cresol and para cresol.	07
Q.3	(a) What are NPK fertilizers?	03
	(b) Compare wet process and electric process in phosphoric acid manufacture.	04
	(c) Explain sulphuric acid manufacture with a neat flow diagram.	07
	OR	
Q.3	(a) Describe classification of dyes based on their application.	03
	(b) Describe the manufacture of caustic soda by electrolytic process using mercury cell.	04
	(c) Explain the manufacturing process of chrome blue black and H-acid.	07
Q.4	(a) What are antiseptic and analgesic drugs?	03
	(b) Describe industrial production of penicillins.	04
	(c) Explain the manufacturing process of aspirin and ascorbic acid.	07
	OR	
Q.4	(a) Enlist types of cements and their uses.	03
	(b) Discuss fermentation of molasses and its products.	04
	(c) Explain in detail manufacture cane sugar from sugar cane with flow sheet diagram.	07
Q.5	(a) Enlist three methods of pulp production.	03
	(b) Explain pulp manufacturing by Kraft process.	04
	(c) Explain in detail settling and hardening of cement.	07
	OR	
Q.5	(a) Discuss composition of crude oil.	03
	(b) Describe a catalytic cracking method for the production of gasoline.	04
	(c) Describe the method of manufacture of vinyl Chloride and acetaldehyde.	07

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-IV (NEW) EXAMINATION – SUMMER 2021****Subject Code:3140508****Date:07/09/2021****Subject Name:Unit Processes & Chemical Technology****Time:02:30 PM TO 05:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

- Q.1** (a) Briefly explain the role of vitamins in human life. **03**
(b) Discuss about the raw materials used in ceramic industries. **04**
(c) Define analgesics and antipyretics. Explain the manufacturing process of aspirin with a neat flow diagram. **07**

- Q.2** (a) Define PVC of paints. What is its significance? **03**
(b) What are dyes? How are they classified according to application? **04**
(c) Describe the manufacture of caustic soda and chlorine by membrane cell process. Also state the advantages of using membrane cell. **07**

OR

- (c) State the applications of sulfuric acid. Describe the manufacture of sulfuric acid by DCDA process. **07**
- Q.3** (a) What are the main constituents of paints? Explain. **03**
(b) Write a short note on industrial coatings. **04**
(c) With a neat flow diagram, describe the manufacturing process of chrome blue black. **07**

OR

- Q.3** (a) Discuss about the classification of drugs and pharmaceuticals. **03**
(b) What is ascorbic acid? How is it produced? **04**
(c) What are antibiotics? Explain the manufacture of penicillin with a neat process flow diagram. **07**

- Q.4** (a) What is absolute alcohol? How is it produced from industrial alcohol? **03**
(b) Briefly explain the manufacturing of paper. **04**
(c) Describe the manufacturing of butyl alcohol and citric acid by fermentation. **07**

OR

- Q.4** (a) What are refractories? State its types. **03**
(b) Briefly explain setting and hardening of cement. **04**
(c) With a neat diagram describe the manufacturing of cement by wet process. Also write the reactions involved in the process. **07**

- Q.5** (a) What is mixed acid? Cite and explain one industrial application of it. **03**
(b) Briefly explain the mechanism of hydrogenation of nitrobenzene. **04**
(c) Describe the pulp manufacturing by Kraft (sulfate) process. Also discuss the difference between sulfate process and sulfite process. **07**

OR

- Q.5** (a) What do you understand by C1, C2 and C3 chemicals? State one use of each. **03**
(b) State four properties of petroleum products and their significance. **04**
(c) Write short notes on processing of petroleum and treatment techniques. **07**

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-IV (NEW) EXAMINATION – SUMMER 2022****Subject Code:3140508****Date:02-07-2022****Subject Name:Unit Processes & Chemical Technology****Time:10:30 AM TO 01:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

MARKS

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|------------|---|-----------|
| Q.1 | (a) Explain the mechanism of acylation of benzene. | 03 |
| | (b) Explain the role of sulfuric acid in nitration process. | 04 |
| | (c) Explain the role of four pass converter to convert SO ₂ into SO ₃ by drawing. | 07 |
| Q.2 | (a) Write the application of various dyes. | 03 |
| | (b) Define dye. How are dyes classified on the basis of structure? | 04 |
| | (c) Explain the manufacturing process of chrome blue black dye with neat sketch diagram. | 07 |
| | OR | |
| | (c) Explain the manufacturing process of H-acid dye with neat sketch diagram. | 07 |
| Q.3 | (a) Write a note on Disperse dyes. | 03 |
| | (b) Explain the mining of sulfur by claus methods. | 04 |
| | (c) Explain the manufacturing process of caustic soda by membrane cell. | 07 |
| | OR | |
| Q.3 | (a) Write a note on Vat dyes. | 03 |
| | (b) Explain the Frasch process for sulfur. | 04 |
| | (c) Explain the manufacturing process of NPK fertilizer with major engineering problems. | 07 |
| Q.4 | (a) Explain the reason for failure of paints. | 03 |
| | (b) Write a note on any one pigments. | 04 |
| | (c) Explain the manufacturing process of paints with neat flow diagram. | 07 |
| | OR | |
| Q.4 | (a) Explain the role of plasticizer/Binder/Oil as an ingredient used in paint | 03 |
| | (b) Write a note on Lithophone as a pigment. | 04 |
| | (c) Explain the manufacturing process of sugar from sugar cane with proper diagram. | 07 |
| Q.5 | (a) What are drugs? Write the types of drugs. | 03 |
| | (b) Explain preparation of Barbitol with chemical reaction | 04 |
| | (c) Explain the manufacturing process of Erythromycin with flow diagram. | 07 |
| | OR | |
| Q.5 | (a) Write various chemical reaction for setting and hardening of cement. | 03 |
| | (b) What is the basic prerequisites of good fermentation. | 04 |
| | (c) Explain the manufacturing process of cement with proper flow diagram. | 07 |
