

SEAT No. \_\_\_\_\_

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**SARDAR PATEL UNIVERSITY**B.Sc. V<sup>th</sup> Semester Industrial Chemistry (CBCS) Examination, (NC)

Industrial Chemistry

Course No.: US05CICH03

Subject: Petroleum Technology

Time: 02:00 P.M. To 04:00 P.M.

28<sup>th</sup> December 2020 Monday

Total Marks: 70

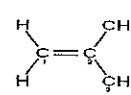
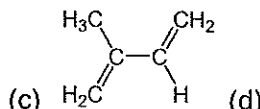
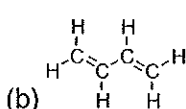
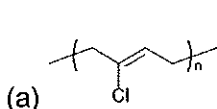
N.B. (1) Marks allotted to the question are on its RHS

(2) Illustrate your answers wherever necessary with the help of neat sketches &amp; chemical equations

**Q. 1 Answer the following MCQ'S:**

(10)

- The highest carbon atom present in the crude oil is \_\_\_\_\_.  
(a) C<sub>90</sub> (b) C<sub>75</sub> (c) C<sub>70</sub> (d) C<sub>80</sub>
- \_\_\_\_\_ Process is used in crude oil for removal of sulphur.  
(a) Selexol (b) Sulfinol (c) Gribotol (d) Demulsification
- Ethylene glycol is prepared from oxidation and hydration of \_\_\_\_\_.  
(a) Ethylene (b) Propylene (c) Acetylene (d) Methane
- Isobutane removed from C<sub>4</sub> Fraction with \_\_\_\_\_.  
(a) 90% H<sub>2</sub>SO<sub>4</sub> (b) 70% H<sub>2</sub>SO<sub>4</sub> (c) 65% H<sub>2</sub>SO<sub>4</sub> (d) 55% H<sub>2</sub>SO<sub>4</sub>
- The flash and fire points are useful in determining a \_\_\_\_\_ and \_\_\_\_\_ resistance  
(a) lubricants volatility and fire (b) lubricants fluidity and fire  
(c) lubricants volatility and solvent (d) lubricants fluidity and solvent
- In \_\_\_\_\_ resin the amount of Maleic Anhydride is added in proportion to other diacids.  
(a) Unsaturated Polyester (b) Saturated Polyester  
(c) Epoxy (d) Polyurethane
- Catalyst used for manufacturing of HCN \_\_\_\_\_.  
(a) Pt Rh (b) V<sub>2</sub>O<sub>5</sub> (c) Fe (d) Clay
- Caprolactam is synthesized from \_\_\_\_\_, which is first converted to its oxime and treatment of this oxime with acid induces the Beckmann rearrangement to give caprolactam.  
(a) Cyclohexanone (b) Benzoic acid (c) Cinnamic acid (d) Isophthalic Acid
- \_\_\_\_\_ is the ideal structure for butadiene rubber production.



- \_\_\_\_\_ is an addition reaction in which hydrogen atoms are added all the way around the benzene ring. A cycloalkane is formed.

(a) Hydrogenation (b) Dehydrogenation (c) Cyclization (d) Alkylation

**Q-2 Fill in the blanks and True or False**

(8)

- Hydrodesulfurization (HDS) is the current industrial method to remove aliphatic and acyclic \_\_\_\_\_ containing compounds from Fuels.
- Naphthenes, also known as cycloalkanes, are saturated hydrocarbons that have at least one ring of carbon atoms.
- Udex is a solvent extraction process for separating aromatics from reformat. The process uses diethylene glycol as the solvent.
- On an industrial scale, \_\_\_\_\_ is prepared by chlorination of methane.
- A Lewis acid catalyst such as \_\_\_\_\_ is employed in the Friedel-Crafts alkylation reaction of benzene in order to form a carbocation by facilitating the

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(P.T.O.)

removal of the halide.

- (f) Carbon disulfide ( $\text{CS}_2$ ), also called Carbon Bisulfide, a colourless, toxic, highly volatile and flammable liquid chemical compound, large amounts of which are used in the manufacture of viscose rayon, cellophane, and carbon tetrachloride.
- (g) The main production method for vinyl acetate monomer is the reaction of ethylene and acetic acid with oxygen, in the presence of a palladium catalyst.
- (h) Acetylene is the chemical compound with the formula  $\text{C}_2\text{H}_2$ . It is a hydrocarbon and the simplest alkyne. This colorless \_\_\_\_\_ is widely used as a fuel and a chemical building block.

**Q.3 Answer any ten of the following:**

**(20)**

- 1 Write in detail about the Organic theory of petroleum formation of crude oil.
- 2 Distinguish between Octane number and Cetane Number
- 3 Explain significance of salts removal from crude oil
- 4 Which are the different chemicals derive from propane-propylene fraction?
- 5 Draw the flow diagram for low temperature condensation and fractional distillation technique for separation cracked petroleum gases.
- 6 Sketch the flow diagram of caprolactum production.
- 7 Give the chemical reaction of  $\text{CS}_2$
- 8 Give the outline of chemical obtained from ethane.
- 9 Sketch the flow diagram of LABS Process.
- 10 Explain regeneration of catalyst, production of Butadiene.
- 11 Explain liquid phase hydration of ethylene
- 12 Sketch the flow diagram of butadiene production.

**Q-4 Long Answer Questions (Attempt any 4 out of 8)**

**(32)**

- 1 Explain extraction of Aromatic fraction using with liquid  $\text{SO}_2$ .
- 2 With the help of flow diagram explain the manufacturing of HCN.
- 3 Outline the Manufacture of caprolactum.
- 4 Explain the manufacture of butadiene.
- 5 Write manufacture methods for the Vinyl acetate
- 6 Enlist the composition of petroleum and explain it in brief.
- 7 Write a note on Distillation & refining of light petroleum products.
- 8 Explain process with flow diagram removal of iso-butane from C4-Fraction

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