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Model Question Bank: **Organic Process Technology**

B.Tech. Second Semester Chemical Engineering and Chemical Technology

Unit 1: Introduction to Unit Processes

- Which one out these is not representing a unit operation
 - Neutralization
 - Filtration
 - Alkylation
 - Drying
- A symbol of heat exchanger is shown near the bottom of distillation tower in the flowsheet. This usually means
 - Vaporization of cold components are going on
 - Cooling of hot components are going on
 - Heating and cooling are going on simultaneously
 - All options are valid
- In case of sulfonation of benzene, there is a provision of valve at the bottom of unit operation number 13. The use of that is
 - To separate the residual salts after process
 - To neutralize the acidic benzene sulfonic acid by alkali addition
 - To neutralize the acidic benzene suitably
 - To recycle the benzene effectively
- During the production of nitrobenzene, the product coming through point D is further discharged in to
 - Storage tank
 - Settling tank
 - Neutralization tank
 - Recovery tank for spent acid
- The concentration of benzene used in the preparation of nitrobenzene using battery reactor is
 - 63%
 - 75%
 - 90%
 - None of these

6. It has been noticed from the flowsheet for commercial production of benzene sulfonic acid that the chemical reaction is taking place at

- A. Kettle sulfonator only
- B. Sulfonation tower with counter-current mode
- C. Kettle and sulfonation tower both
- D. Bottom of sulfonation tower only

7. Role of unit operation No. 11 in the flowchart of sulfonation of benzene is designed for

- A. To separate product from unreacted benzene
- B. To separate product from unreacted spent acid
- C. To separate water from benzene
- D. To separate sulfones from benzene sulfonic acid

8. If we apply vacuum in distillation tower for effective separation which means

- A. Pressure of distillation tower is greater than 1 Atm
- B. Temperature of distillation tower is greater than 100 degree C
- C. We are interested in increasing the boiling point of reactants
- D. Pressure of distillation tower is less than 1 Atm

9. The kinetics of aromatic sulfonation is usually slow when we are using ----- as an agent.

- A. Concentrated Sulfuric acid
- B. Chloro sulfonic acid
- C. Oleum
- D. All of these

10. The overflow in case of nitrobenzene using fortified nitric acid is finally passing to

- A. Settler
- B. Washer
- C. Neutralizer
- D. Dryer

Unit 2: Recent Advancement in Green Chemistry & Catalyst

1. Which one of the following compound is acting as a catalyst in the commercial production of ethyl benzene?

- A. Hydrochloric acid
- B. Ethyl chloride
- C. Aluminium trichloride and HCl
- D. Ethyl chloride and Aluminium trichloride

2. The technical meaning of dry benzene in bulk production of ethyl benzene is
- A. None of these
 - B. The concentration of water in benzene must be less than 40ppm
 - C. The concentration of water in benzene must be greater than 30 ppm
 - D. The concentration of water in benzene must be almost equal to 300 ppm
3. During isolation of unreacted benzene from product, the temperature of distillation column at top cut is
- A. None of these
 - B. 248 degree F
 - C. 178 degree C
 - D. 137 degree C
4. The triglyceride molecule subjected for trans-esterification using methanol is representing acid composition having 16 carbon atoms. The biodiesel obtained in this case is actually contain
- A. Three moles of Methyl palmitate
 - B. Three moles of Methyl oleate
 - C. Three moles of Methyl stearate
 - D. Mixed composition of methyl palmitate- stearate
5. Separate the non-green solvent from the given options to avoid environmental pollution
- A. Toluene
 - B. Pyridine
 - C. Heptane
 - D. Ethyl acetate
6. With the help of -----enzyme catalyst we can hydrolyze the cane sugar in to glucose and fructose
- A. Invertase
 - B. Zymase
 - C. Lactobacillus
 - D. Yeast
7. The role of hydrochloric acid as homogeneous catalyst in hydrolysis of sucrose is
- A. To provide surface area for adsorption of reactants
 - B. To decrease the activation energy of reactants
 - C. None of these
 - D. To provide surface area and decrease the activation energy both
8. We should look forward towards alternate methods for products if the raw materials involved in the reaction are having carcinogenic nature is explained in
- A. Tenth principle of green chemistry

- B. Seventh principle of green chemistry
- C. Fourth principle of green chemistry
- D. Fifth principle of green chemistry

9. The concept of sixth principle of green chemistry deals with one of the following point

- A. Look for alternative ways to save energy
- B. Increase the efficiency of heating system
- C. Production of energy from waste products
- D. All options are valid

10. One of the major reason behind non commercialization of Bio-diesel in our country is

- A. Non security of availability of biomass feedstock
- B. Separation of water molecules with high efficiency is challenging
- C. Separation of soap during process is difficult and time consuming
- D. All options are looking valid

Unit 3: Recent Advancements in Green Catalysts

1. The of purification of crude petroleum oil is also known as reformate process due to

- A. It improves octane value of fuel
- B. It converts paraffins to aromatics with name number of carbon atoms
- C. Reformate means reduction of compounds with higher carbon atoms in to lower
- D. It produces LPG during process

2. The presence of this category of organic compounds improves the octane value of fuel

- A. Naphthene's
- B. Aromatics
- C. Paraffins
- D. All of them

3. The net gain of hydrogen molecules in petroleum refining(reformate) process due to

- A. We are supplying already excess amount of hydrogen with feed
- B. Dehydrogenation reactions takes place
- C. Hydrogen is not recycled suitably
- D. Due to usage of green catalyst

4. The role of heat exchanger in petroleum hydrogenation is

- A. Heating and cooling of feed simultaneously to retain economy in process
- B. To cool down the hot vapors coming from fixed bed reactor
- C. To preheat the cold feed along with hydrogen molecules before subjected to reformation
- D. To ensure safety in process

5. Who have discovered the modified mechanism for commercial production of aniline which makes the kinetics improved

- A. Bechamp
- B. Wohl
- C. Perkin
- D. All of the above

6. In the commercial production of aniline, the catalyst material present is in the form of

- A. Nickel metal with clay coating
- B. Shavings and borings of enameled cast iron scrap
- C. Cast iron with oil and grease to ease lubrication
- D. Simple, grey cast iron in the form of borings without grease and oil

7. The composition of following in petroleum hydrogenation can be a useful raw material for LPG

- A. C1 and C2
- B. C1 to C4
- C. C3 and C4

8. The storage tank for collecting the crude aniline from condenser is indicated by following number in reducer house plant

- A. 7
- B. 16
- C. 6
- D. 5

9. The role of concentrated sulfuric acid in the preparation of dimethyl aniline is

- A. To provide strong acidic medium to enhance speed of reaction
- B. To react with methyl alcohol to form methyl hydrogen sulfate
- C. To dehydrate the water from agent(methyl alcohol) to speed up the reaction
- D. To form spent acid at the end of the reaction

10. In the commercial production of aniline using green route, the unreacted nitrobenzene can be collected from

- A. Reboiler from aniline purifying column
- B. Aniline purifying column
- C. Condenser for aniline purifying column
- D. Aniline dehydrating column

Unit 4: Recent Advancement (Green Catalyst) in Polymerization

1. Which one out of these is a good quality biodegradable plastic in real sense?
 - A. Cellulose monoacetate
 - B. Cellulose diacetate
 - C. Cellulose triacetate
 - D. All of these
2. The catalyst used in the commercial production of PLA is
 - A. Copper metal
 - B. Platinum metal
 - C. Tin octanoate
 - D. Nickel metal
3. The requirement of catalyst mass in the manufacture of cellulose acetate is 550g. How much should i weigh cotton linters?
 - A. 54 kg
 - B. All options are incorrect
 - C. 88 kg
 - D. 62.5 Kg
4. To convert waste corn(biomass)to lactic acid monomers, which one of the following is needful
 - A. Alpha amylase enzymes
 - B. Lactobacilli and alpha amylase
 - C. Lactobacilli only
 - D. Methyl alcohol
5. In the commercial production of cellulose acetate, for ----- of cotton linter, the requirement of acetic acid according to stoichiometry is 6.4
 - A. 2 parts
 - B. 2.7 parts
 - C. 4 parts
 - D. None of these
6. The introduction of acetyl groups upon cellulose is made possible with the use of following agent (Two options are correct)

- A. Acetic acid
- B. Acetic anhydride
- C. Sulfuric acid
- D. Cotton seeds

7. The molecular weight of poly-lactic acid polymer is 28,800. Calculate the degree of polymerization of same. The answer is

- A. 420
- B. 300
- C. 320
- D. None of these

8. The problem of eutrophication can be commonly identified by -----in any lakes or ponds by

- A. Growth of Algal bloom
- B. Growth of phytoplankton
- C. Growth of bio-aquatics
- D. Clean water

9. Zeolite-A based detergent powders can be called as green detergents due to

- A. The color of detergent powder becomes green after addition of Zeolite-A
- B. It helps in accumulating green algal bloom over surface of water bodies
- C. Its composition represents phosphate free clay(soil)material
- D. Zeolite A can be synthesized from rice husk ash using green route

10. A good quality detergent powder must satisfy the following property

- A. Strong surfactant having capability to generate foam
- B. Anti-redeposition properties of detergent builder
- C. All of these
- D. Non phosphatic detergent builder with good ion exchange capacity

