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DAA-003-001537 Seat No. _____

B. Sc. (Sem. V) (CBCS) Examination

April / May – 2015

IC - 501

Dyes-1 & Petrochemicals

Faculty Code : 003

Subject Code : 001537

Time : Hours] [Total Marks : **70**

Instructions: (1) All the questions are compulsory.

(2) Figures to the right indicate maximum marks.

(3) Draw labeled diagram wherever necessary.

(4) Assume suitable data.

(5) Question 1 carries 20 marks and Question 2 & 3 each carries 25 marks.

1 Answer the following MCQ type of questions: **20**

(1) Adipic acid is a monomer for the production of _____.

(a) Nylone-6 (c) Epoxy resin

(b) Nylone-6,6 (d) None

(2) _____ is used for manufacture of Rayon, CCl_4, pesticides and as a solvent.

(a) H_2S (c) CO

(b) CS_2 (d) None of the above

(3) In manufacturing of Vinyl Acetate monomer, the reaction temperature should be _____ °C?

(a) 110-150 °C (c) 300 °C

(b) 50-60 °C (d) None of the above

(4) Dimethyl terephthalate is important derivatives of _____.

(a) Ethanol (c) Methanol

(b) Formic acid (d) None of the above

(5) In which proportion propylene, air and steam are fed in the reactor in Acrylic acid production?

(a) 1:5:4 (c) 4:1:5

(b) 5:1:4 (d) None of the above

(6) Which of the following by-product are formed in IPA production?

(a) Ethanol (c) Di isopropyl ether

(b) Propane (d) None of the above

(7) β-Naphthol is used as _____.

(a) Naphthalyamine production

(b) Anti-oxidant

(c) a and b both

(d) Insecticide "sevin"

(8) From which of the following ways Acetic Acid can be manufactured?

(a) CH_3OH Carboxylation

(b) CH_3CHO Oxidation

(c) C_2H_5OH Dehydrogenation/Oxidation

(d) All of the above

(9) _____ is a monomer for the production of Nylon-6.

(a) Adipic Acid (c) Dimethyl terephthalate

(b) Caprolactum (d) None

(10) The reaction $CO + H_2O \rightarrow CO_2 + H_2$ occurs in _____.

(a) Primary reformer (c) Secondary reformer

(b) Shift converter (d) None

(11) Which of the following is a Direct Dye?

(a) Indanthrone (c) Congo red

(b) Methyl violet (d) Alizarin

(12) Indigo can be prepared from?

(a) Aniline (c) Phenol

(b) Toluene (d) o-Cresol

(13) The first member of the group Disperse Dye was introduced in the year?"

(a) 1914 (c) 1934

(b) 1924 (d) 1944

(14) Which of the following is Effluent Treatment Plant equipment?

(a) Clarifier (c) Aerators

(b) Sludge digester (d) All

(15) Which of the following is a Basic Dye?

(a) Crystal violet (c) Orange-II

(b) Picric acid (d) Congo red

(16) The function of Dispersing agent is?

(a) To increase penetration of dye on fiber

(b) To increase solubility in aqueous phase

(c) both (a) & (b)

(d) None

(17) The stability of Reactive dyes is due to?

(a) Covalent bond (c) Ionic bond

(b) Hydrogen bond (d) All

(18) Which of the following theory is also known as 'Chromophore – Auxochrome' theory?

(a) Armstrong (c) Baeyer

(b) Watson (d) Witt

(19) Which of the following transition will require lowest energy?

(a) $\sigma \rightarrow \sigma^*$ (c) $\pi \rightarrow \pi^*$

(b) $n \rightarrow \pi^*$ (d) $n \rightarrow \sigma^*$

(20) The reactive system in Anthraquinone Vat dye is?

(a) >C=O

(b) $-CO-(CH=CH)_n-CO-$

(c) >C=C<

(d) –N=N–

2 (A) Answer **any Three** out of Six **6**

(1) Give reaction and uses for Ethanol production.

(2) Write properties, chemical reaction and uses of Dimethyl terephthalate.

(3) Write down available process for production of Acrylonitrile.

(4) Define :

(i) VAT dyes

(ii) Disperse Dye.

(5) Explain: Acid dyes in brief.

(6) Explain: Mordant dyes in brief.

(B) Answer **any Three** out of Six **9**

(1) Write down properties, chemical reaction and use of Hydrogen cyanide.

(2) Draw the process flow diagram for C_4 fraction separation.

(3) Give only scheme for CO production.

(4) Give the synthesis of lndanthrene Yellow 4GK.

(5) Describe important data for plant scale-up.

(6) Give the synthesis of Thioindigo.

(C) Answer **any Two** out of Five **10**

(1) Give detailed account on Styrene production.

(2) Describe Butadiene production in detail.

(3) Explain SNG production by partial oxidation method in detail.

(4) Give detailed synthesis of Indanthrene Rubene-R.

(5) Explain: Witt's theory in detail.

3 (A) Answer **any Three** out of Six **6**

(1) What do you mean by distillation and extraction?

(2) What do you mean by synthesis gas?

(3) Write down uses of Glycerol.

(4) Define: (i) Optical Whiteners (ii) Pigment.

(5) Give reason: Ethylene is colorless but β-carotene is orange red in color.

(6) Give reason: p-Amino azo benzene is yellow but in acidic solution it becomes violet.

(B) Answer **any Three** out of Six **9**

(1) Write down all the chemical reactions involved in Vinyl Acetate production.

(2) Give properties, reaction and uses of Maleic Anhydride.

(3) Write down reaction for caprolactem production.

(4) Give synthesis of Disperser Red 4.

(5) Explain: Limitations of poor plant layout.

(6) Give synthesis of lndanthrene Brown RRD.

(C) Answer **any Two** out of Five **10**

(1) Describe manufacturing of Acetylene production in detail.

(2) Give detailed account on propylene oxide.

(3) Explain: Molecular Orbital Theory.

(4) Give any three synthesis of Indigo.

(5) Explain: Detailed manufacturing of Reactive Red.
