AAR-003-001404 Seat No. _____

Second Year B. Sc. (Sem. IV) (CBCS) Examination

April / May – 2016

Chemistry : C-401

(New Course)

Faculty Code : 003

Subject Code : 001404

Time : $2\frac{1}{2}$ Hours] [Total Marks : **70**

Instructions : (i) All the questions are compulsory.
(ii) At the right side, figure shows the marks.
(iii) Question 2 and 3 carries 25 marks each.

1 M.C.Q.'s : **20**

(1) Pyridine is _____

(A) acid (B) base

(C) neutral (D) none

(2) The decreasing order of aromaticity of pyrrole, furan and thiophene is _____

(A) thiophene > pyrrole > furan

(B) pyrrole > thiophene > furan

(C) furan > thiophene > pyrrole

(D) None

(3) Thiophene is obtained by the reaction of butane and sulphur at

(A) 400°C (B) 600°C

(C) 800°C (D) none

(4) IUPAC name of E.A.A. is _____

(A) Ethyl 3-oxo pentanoate

(B) Ethyl 1,3 diketo butanoate

(C) Ethyl 3-oxo butanoate

(D) none

(5) Crotonic acid is obtained by reaction of EAA with _____ in presence of pyridine.

(A) Acetone (B) Acetaldehyde

(C) Acetyl acetone (D) Acetic acid

(6) Diethyl zinc is _____ type of organometallic compound.

(A) covalent (B) ionic

(C) electron deficit (D) sandwich

(7) In molecular formula of ferrocene, Fe shows _____ valency.

(A) +2 (B) +3

(C) +1 (D) 0

(8) The potential energy ____ due to attraction.

(A) increases (B) decreases

(C) becomes zero (D) none

(9) According to orthogonality condition, $\int \psi\psi^* dv =$ _____.

(A) 1 (B) –1

(C) 0 (D) none

(10) Zeise salt is related to _____ metals.

(A) alkali (B) alkaline earth

(C) transition (D) none

(11) Acidic hydrolysis of sugar is _____ reaction.

(A) first order (B) second order

(C) third order (D) pseudo unimolecular

(12) Hydrolysis of $CH_3COOC_2H_5$ in presence of NaOH is ____ order reaction.

(A) 1^{st} (B) 2^{nd}

(C) 3^{rd} (D) 0

(13) In Ziegler Natta polymerization reaction, $TiCl_4$ acts as -

(A) electron donor (B) co-catalyst

(C) electron acceptor (D) none

(14) Which of the followings is colloid ?

(A) H_2O+NaCl (B) H_2O+Sand

(C) $H_2O+C_6H_6$ (D) none

(15) Melamine formaldehyde is _____

(A) fibre (B) rubber

(C) resin (D) none

(16) The role of flux in ceramic is _____

(A) makes brittle (B) increases hardness

(C) lowers the temperature (D) none

(17) _____ is example of condensation polymer.

(A) Nylon-66 (B) Buna-S

(C) Cotton (D) Orlon

(18) Tyndall effect is related to _____ of light.

(A) reflection (B) refraction

(C) scattering (D) none

(19) Raw material to make ceramic is _____

(A) lime stone (B) clay

(C) dolomite (D) plaster of paris

(20) Fire bricks are made from _____

(A) $Al_2O_3SiO_2 \cdot 2H_2O$ (B) $Al_2O_3SiO_2 3H_2O$

(C) $Al_2O_3SiO_2 \cdot OH_2O$ (D) none

2 (a) Answer any three : **6**

(1) Define - Bonding M.O. and Antibonding M.O.

(2) Give any two preparations of organo beryllium compounds.

(3) Give the classification of organometallic compounds.

(4) Explain the mechanism of keto-enol tautomerism.

(5) Why pyridine is less basic than aliphatic amines ?

(6) Give the synthesis of succinic acid from E.A.A.

(b) Answer any three : **9**

(1) Write short note - organo lithium compounds.

(2) Explain the rules to derive the coefficients of wave functions for hybrid orbitals.

(3) Explain the potential energy of H_2 molecule and derive the Schrodinger equation for it.

(4) Explain the electrophilic substitution reaction of pyrrole.

(5) Give any three methods for synthesis of thiophene.

(6) Give the synthesis of 4 methyl uracil from E.A.A.

(c) Answer any two : **10**

(1) Derive the coefficient of wave functions for sp^2 hybridization.

(2) Discuss the preparation and structure of ferrocene.

(3) Explain claisen condensation to prepare ethyl acetoacetate with mechanism.

(4) Give the physical properties of ethyl acetoacetate and explain its constitution.

(5) Give the two synthesis of each, pyrrole, furan and thiophene.

3 (a) Answer any three : **6**

(1) Explain - Gold number.

(2) Explain - zero order reaction.

(3) Define - thermoplastic and thermosetting plastic.

(4) Explain - energy of activation.

(5) Define - hydrophilic sol and hydrophobic sol.

(6) Enlist the metal oxides to colour the glaze for decoration.

(b) Answer any three : **9**

(1) Explain in detail first order reaction.

(2) Write short note - collison theory.

(3) Give the applications of colloids.

(4) Give the classification of refractories.

(5) Give the raw materials used for ceramics.

(6) Explain the purification of colloidal solution.

(c) Answer any two : **10**

(1) Discuss the classification of polymers.

(2) Discuss the third order reaction.

(3) Discuss the electrophoresis and electro-osmosis.

(4) Discuss the various methods to prepare lyophobic colloids by dispersion method.

(5) Discuss the properties of refractories.
