



DM-003-001404

Seat No. \_\_\_\_\_

**B. Sc. (Sem. IV) (CBCS) Examination**

April / May – 2015

**Chemistry : C - 401**

**Faculty Code : 003**

**Subject Code : 001404**

Time :  $2\frac{1}{2}$  Hours]

[Total Marks : 75

- Instructions :**
- (1) Question-1 contains 20 MCQ type questions of one mark each. All are compulsory.
  - (2) Write answer of all questions including MCQ in main answer sheet.
  - (3) Question number 2 and 3 carrier 25 marks with internal option.

**1** Write correct answer from the multiple choice given for the following questions. **20**

- (1) Who gave molecular orbital theory ?  
(a) Mullikan and Hund (b) Pauling  
(c) Lewis (d) Heitler and London
- (2) The potential energy of opposite ions is -  
(a) 0 (b) +ve  
(c) -ve (d) None of the three
- (3) Which of the following bond is must for organometallic compounds ?  
(a) M - M (b) M - C  
(c) C - C (d) None of this

- (4) Which of the following is not a organometallic compound ?
- (a) Ph - Li                      (b) R-MgX  
(c) R-ONa                        (d) Al(CH<sub>3</sub>)<sub>3</sub>
- (5) 4-Methyl uracil is obtained by the reaction of Ethyl acetoacetate with -
- (a) Ammonia                      (b) Urea  
(c) Hydrazine hydrate        (d) Acetamide
- (6) Which of the following is more aromatic ?
- (a) Pyrrole                        (b) Thiophene  
(c) Furan                         (d) Cyclopentane
- (7) The electrodeficient bond present in dimer of trimethyl aluminium is -
- (a) 3C-2e                        (b) 2C-2e  
(c) 2C-3e                        (d) 3C-3e
- (8) Ferrocene contains -
- (a) Sandwich structure        (b) Bent structure  
(c) Planer structure            (d) None of these
- (9) Which position is more reactive for pyrrole, furan and thiophene -
- (a) 2                                (b) 3  
(c) 4                                (d) none of this
- (10) The hydrogens of active methylene group are -
- (a) acidic                         (b) basic  
(c) neutral                        (d) None of (a) or (b)

- (11) Cheese is the example of \_\_\_\_\_ type of colloid.
- (a) Sol                      (b) Solid  
(c) Gel                      (d) None
- (12) Teflon is obtained from \_\_\_\_\_.
- (a) Fluorobenzene      (b) Trifluoroethylene  
(c) Tetrafluoroethylene (d) Chlorofluorocarbon
- (13) In ceramics, the process of making a large number of similar article economically is known as -
- (a) jollyng                      (b) kneading  
(c) glazing                      (d) both (a) & (b)
- (14) The raw material used for making ceramics is
- (a) Clay                      (b) Limestone  
(c) Plaster of paris      (d) Cement
- (15) Melamine-formaldehyde is a \_\_\_\_\_ polymer.
- (a) Linear                      (b) Branched  
(c) Cross-linked      (d) all of above
- (16) Soap is \_\_\_\_\_ in water.
- (a) Colloid                      (b) Crystalloid  
(c) any                      (d) none
- (17) \_\_\_\_\_ is emulsion.
- (a) milk                      (b) butter  
(c) both (a) & (b)      (d) none

(18) \_\_\_\_\_ is an example of condensation polymer.

- (a) Polyethylene                      (b) PVC  
(c) Teflon                                (d) Terylene

(19) For which order of reaction half-life is independent of initial concentration ?

- (a) Zero                                    (b) First  
(c) Second                                (d) Third

(20) If the temperature of the reaction is increased by 10°C, then temperature co-efficient of the reaction is increased -

- (a) 2 to 3 times                      (b) 5 to 7 times  
(c) 10 times                              (d) None of this

**2** Answer the following as per instructions.

(A) Answer any three from the following six questions. **6**

- (1) Explain LCAO method in short.  
(2) Give preparation of ferrocene.  
(3) Draw structure of the dimer of Trimethyl aluminium.  
(4) Give preparation of furan and pyrrole.

- (5) Discuss nitration of thiophene.
- (6) What are reactive methylene compounds ? Give two examples.

(B) Answer any three from the following six questions. **9**

- (1) Discuss relative basicity of pyridine, pyrrole and aliphatic amines.
- (2) Discuss keto-enol tautomerism in ethylacetoacetate.
- (3) Derive explain coefficient of wave function of sp hybridization.
- (4) Give uses of organolithium compound.
- (5) Give preparation of organoaluminium compounds.
- (6) Give synthesis of 2,5-Dimethyl pyrrole from ethylacetoacetate.

(C) Answer any two from the following five questions. **10**

- 1) Explain structure and aromaticity of pyridine.
- 2) Explain with reaction mechanism claisen condensation for the synthesis of EAA.
- 3) Discuss electrophilic substitution reactions of pyridine.
- 4) Discuss structure of zeise salt.
- 5) Explain potential energy of  $H_2$  molecule and derive schrodinger equation for it.

**3** (A) Answer any three from the following six questions. **6**

- (1) Give any two applications of Colloids.
- (2) Give definition of lyophilic and lyophobic colloids.
- (3) Define thermal spalling and refractoriness.
- (4) Explain Homo polymer and Co-polymer.
- (5) Define the term : Molecularity and order of reaction.
- (6) Prove that half-life time of zero order reaction is proportional to initial concentration of reactant.

(B) Answer any three from the following six questions. **9**

- (1) Explain Gold number.
- (2) Explain Electrophoresis.
- (3) Give classification of Ceramics.
- (4) Give classification of polymer on the basis of structure (Chain).
- 5) Differentiate Thermo-plastic polymer and Thermosetting polymer.
- (6) The half-life period for radioactive decay of  $^{14}\text{C}$  is 5730 year. An archaeological article contained wood had only 80% the  $^{14}\text{C}$  found in living tree. Estimate the age of the sample.

(C) Answer any two from the following five questions. **10**

- (1) Name important properties of refractories and explain any five.
  - (2) Give synthesis and application of Bakelite.
  - (3) Write a note on Ziegler-Natta polymerization.
  - (4) Give application of colloids.
  - (5) Describe the methods to determine order of reaction.
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