



**RAI-003-001404**

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

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

**March / April - 2019**

**Chemistry - C-401**

*(Old Course)*

**Faculty Code : 003**

**Subject Code : 001404**

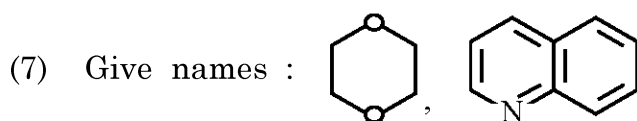
Time :  $2\frac{1}{2}$  Hours]

[Total Marks : 70

- Instructions :** (1) This question paper contains three questions, all are compulsory.  
(2) Figures to the right indicate full marks.

1 Answer the following : **20**

- (1) What is symbol of Laplacian operator ?
- (2) Write Schrodinger equation.
- (3) Give two names of Sandwich type of organometallic compounds.
- (4) What is Zeise salts ?
- (5) Which type of hybridization has  $Fe^{+2}$  in Ferrocene ?
- (6) Draw structure of furan and thiophene.



- (8) What is tautomerism ?
- (9) Ethyl acetoacetate gives which colour with  $FeCl_3$  ?
- (10) What is molecularity ?
- (11)  $N_2O_5 \rightarrow 2NO_2 + \frac{1}{2}O_2$ . What is the order of the reaction ?
- (12) Write unit of K for second order of reaction.

- (13) Give two examples of aerosol.
- (14) Complete the reaction :  $\text{As}_2\text{O}_3 + 3\text{H}_2\text{S} \rightarrow$ .
- (15) What is dialysis?
- (16) Which substances are present in acidic refractories ?
- (17) For blue colour in ceramic which oxide is used.
- (18) Based on mode of polymerization, which are the types of polymers ?
- (19) What is thermoplastic polymers ?
- (20) Which monomers are used to synthesize bakelite ?

**2** (a) Answer any three of the following : **6**

- (1) Write note : Wave function of  $H_2^+$ .
- (2) Explain structure of trimethyl aluminium.
- (3) Give reaction of ethyl acetoacetate with ammonia and primary amine.
- (4) Write note on physical property of ethyl acetoacetate.
- (5) Write two synthesis of pyrrole.
- (6) Give resonance structure of Furan.

(b) Answer any three of the following : **9**

- (1) Explain  $sp^2$  hybridization.
- (2) Discuss basicity of pyridine.
- (3) Discuss the use of organo lithium compounds.
- (4) Explain preparation of organoaluminium compounds.
- (5) Write nitration, sulphonation and halogenation reaction of thiophene.
- (6) Discuss chemical property of organolithium compounds.

(c) Answer any two of the following : 10

- (1) What is Zeise salt ? Explain synthesis and structure of  $K[PtCl_3(C_2H_4)]$
- (2) Explain potential energy and Schrodinger equation for  $H_2$  molecule.
- (3) Discuss reaction of ethyl acetoacetate undergo due to keto group.
- (4) Write electrophilic substitution reaction of Pyrole.
- (5) Explain preparation of crotonic acid and 2-pentanone from ethyl acetoacetate.

3 (a) Answer any three of the following : 6

- (1) Write note on order of the reaction.
- (2) Explain Brownian movement.
- (3) Derive half life time for Zero order reaction.
- (4) What is elastomers and fibers ?
- (5) Write good characteristics of refractories.
- (6) Discuss porosity of refractories.

(b) Answer any three of the following : 9

- (1) Derive equation of rate constant for first order reaction.
- (2) Discuss energy of activation.
- (3) Explain Bredig's arc method.
- (4) Discuss lyophilic sol. and lyophobic sol.
- (5) Explain manufacturing of fire clay bricks.
- (6) Give classification of polymers based upon structure.

(c) Answer any two of the following : 10

- (1) Explain collision theory for bimolecular reaction.
  - (2) Explain application of colloids.
  - (3) Discuss manufacturing process of refractories.
  - (4) Explain mechanism of addition polymerization.
  - (5) Write chemical methods of preparation of colloidal sol.
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