



MAW-003-001304 Seat No. _____

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

October / November – 2016

C-301 : Chemistry

Faculty Code : 003

Subject Code : 001304

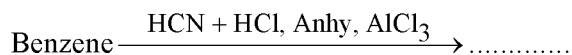
Time : $2\frac{1}{2}$ Hours]

[Total Marks : 70

- Instructions :** (1) Question 1 contains 20 sub-questions of one mark each, all are compulsory.
(2) Question 2 and 3 carry 25 marks each with internal option.

1 Answer the following in short / single line : **20**

- (1) Give an equation for wavelength λ according to De-Broglie.
- (2) Give symbol of Laplacian operator.
- (3) What is symbol for Cerium ?
- (4) Write electronic configuration of Holmium (Ho).
- (5) What is atomic number of Thulium ?
- (6) Mention the structure of 1,4-dichloro-3-pentanone.
- (7) Complete the reaction :



- (8) Give IUPAC name for $\begin{array}{c} \text{CH}_2 - \text{COOH} \\ | \\ \text{CH}_2 - \text{COOH} \end{array}$
- (9) Give an example of Grignard reagent.
- (10) Define electrophiles.
- (11) How many are phase(s) of mixture of gases system?

- (12) If CaCO_3 heated in closed vessel : Write equilibrium equation for that.
- (13) In equation $P+F = C+2$ where C is _____ (fill blank).
- (14) Stalagmometer is useful for what ?
- (15) What do you mean by Molar volume ?
- (16) What is the CGS unit for dipole moment?
- (17) Water gas is also known by which name ?
- (18) Give full form of GCV.
- (19) Define the drug.
- (20) Give name and structure of a dye which is synthesized via diazotization.

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

- (1) Define Eigen function and Eigen value.
- (2) What is Misch metal ?
- (3) Rearrange the given molecules in general order of reactivity : Acetone, Acetaldehyde, Benzophenone, Formaldehyde and Benzaldehyde.
- (4) Give only reaction of Wolf - Kishner reduction.
- (5) What are contents of Fehling – A and Fehling – B solutions ?
- (6) A reaction takes place between benzaldehyde and acetic anhydride in presence of sodium acetate; what would be the product ? And what is name of this reaction ?

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

- (1) Write short note for Lanthanide contraction.
- (2) Discuss individual isolation of Lanthanides by any two methods.
- (3) Prove that $\psi_m = \sqrt{\frac{2}{a}} \sin \frac{\pi}{a} x$ and $\psi_n = \sqrt{\frac{2}{a}} \sin \frac{3\pi}{a} x$.

are orthogonal ($0 < x < a$).

- (4) What is acetal and ketal ? Give their formations.
- (5) Chloroacetic acid is more acidic than acetic acid, describe with reasons.
- (6) Give reaction for formation of amide, ester and acid halide from acid.

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

- (1) Discuss basic postulates of wave mechanics.
- (2) Derive the Schrodinger equation for particle wave.
- (3) Give uses of Lanthanides and their compounds.
- (4) Discuss Aldol condensation with mechanism.
- (5) Explain Hell - Volhard – Zelinsky reaction.

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

- (1) Calculate the parachor value of benzene.
- (2) What is phase diagram ?
- (3) Define degree of freedom with an example.
- (4) What is gross and net calorific value ?
- (5) Explain chromophore and auxochrome with examples.
- (6) Give a synthesis of Veronal.

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

- (1) "Ideal solutions obey Roults law " – is it true ? Explain it.
- (2) Write short note for surface tension.
- (3) Write types of physical properties of substance and define any two.
- (4) Briefly explain carbonization of coal.
- (5) Give classification of fuels.
- (6) Give synthesis of malachite green.

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

- (1) Describe the methods to measure dipole moment.
 - (2) Discuss applications of dipole moment.
 - (3) Write note on artificial and natural solid fuels.
 - (4) Explain Pb-Ag system with diagram.
 - (5) Give classification of dyes with examples.
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