JAJ-003-001304   Seat No. _____

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

November - 2019

Chemistry : C - 301

(Old Course)

Faculty Code : 003

Subject Code : 001304

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

Instructions : (1) All questions are compulsory.

(2) Q. 1 carries 20 marks, Q.2 carries 25 marks and Q. 3 carries 25 marks.

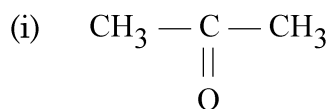**1**   Answer the following :   **20**

(1) Ψ is known as a _____ function.

(2) Write the Normalization condition for a wave function.

(3) Write the electronic configuration of cerium.

(4) What are paramagnetic ions ?

(5) Common name of HCHO is _____.

(6) $CH_3 - \underset{\underset{OH}{|}}{CH} - CH_3 + [O] \xrightarrow[H^+]{K_2Cr_2O_7}$

(7) $RCOOH + NaOH \rightarrow$ _____ + _____ .

(8) Write the structure of Witting Reagent.

(9) Which acid is present in Vinegar ?

(10) An anhydride undergoes hydrolysis to form _____.

(11) Write the structure of 2-methyl propanoic acid.

(12) $CH_3 - \underset{\underset{O}{||}}{C} - OH + \underset{(excess)}{CH_3 - CH_2 - OH} \xrightarrow{H^+}$
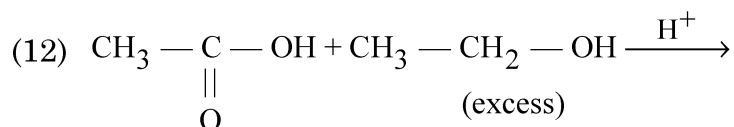
(13) Name the apparatus used to measure surface tension.

(14) Refractive index is based on which law ?

(15) A compound that can rotate plane of polarized light is called Optically _____ compound.

(16) 1 kilocalorie = _____ calories.

(17) Write the full form of GCV.

(18) Write mathematical form of Gibbs Phase value.

(19) How many types of phases are there in water system ?

(20) Paracetamol is a drug or a dye ?

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

       (1)   What is eigen function and eigen value ?

       (2)   What is Misch metal ?

       (3)   Give IUPAC name of

$$CH_3 - \underset{\underset{O}{\overset{\|}{}}}{C} - CH_3$$

          (ii) CH_3CHO

       (4)   Give structural formula of :

          (a)   2-amino propanal

          (b)   2-pentanone

       (5)   Explain formation of acid chlorides.

       (6)   Define ionic radii and atomic radii.

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

       (1)   Explain Lanthanide Contraction.

       (2)   Give physical significance of ψ^2 and $\psi * \psi$.

       (3)   Explain Wolff-Kishner reduction reaction.

       (4)   Discuss hydrolysis of acid derivatives.

       (5)   Explain trans-esterification.

       (6)   Explain orthogonality condition.

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

   (1) Derive Schrodinger wave equation.

   (2) Describe electronic configuration of lanthanids with necessary explanation.

   (3) Explain Aldol condensation reaction with mechanism.

   (4) Describe Hell Volhard Zelinsky (HVZ) reaction for carboxylic acid.

   (5) Explain with reaction mechanism formation of Ketal.

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

   (1) What is Dipole moment ? Give its units.

   (2) Define : (i) Viscosity (ii) Surface tension

   (3) Define degree of freedom with an example.

   (4) Explain Auxochrome and Chromophore.

   (5) What is Calorific value ?

   (6) Define drugs. Name any three drugs.

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

   (1) Explain types of physical properties.

   (2) Explain Rauolt's law.

   (3) What is steam distillation ? Explain in brief.

   (4) Give classification of fuels.

   (5) Explain carbonization of coal.

   (6) Give the synthesis of Methyl Orange.

(c) Answer any two of the following : 10

   (1) Discuss the applications of dipole moment.

   (2) Describe water system with phase diagram.

   (3) Write a short note on Bomb Calorimeter.

   (4) Write a note on Natural gas and Biogas.

   (5) Give the synthesis and uses of Indigo.