Code No . :   sub code : JMCH 11/ SMCH 11

B.Sc . (CBCS) DEGREE EXAMINATION

NOVEMBER 2017

First Semester

Chemistry – Main

Paper 1 - INORGANIC CHEMISTRY – 1

(For those who joined in July 2016 and afterwards)

Time : Three hours   Maximum : 75 marks

PART A – (10 X 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. The symbol represents the azimuthal quantum number is

   (a)   m   (b)   s
   (c)   l   (d)   nl

2. The correct electronic configuration of chromium is

   (a) $[Ar]^3d^4 4s^2$ (b) $[Ar]^3d^3 4s^2 4p^1$

   (c) $[Ar]^3d^5 4s^1$ (d) $[Ar]^3d^3 4s^2 4p^2$

3. Which one of the following has the greatest electron affinity :

   (a)   Chlorine   (b)   bromine

   (c)   Fluorine   (d)   Iodine

4. If $X_a - X_b > 1.7$, the predominant character of the bond is

   (a) Ionic   (b) covalent

   (c) Dative   (d) None of these

5.   The bond order of N_2 molecule is

   (a) 1   (b) 3

   (c) 2   (d) 2.5

6. Which one of the following is formed by sp_3d hybridisation?

   (a) $[Pt Cl_4]^{2-}$ (b) IF_7

   (c) PCl_5 (d) SF_6

7. Which of the elements does not form the stable hydride ?

   (a) Pt   (b) Ca

   (c) Li   (d) Na

8. $LiNO_3$ on heating gives the product/products

   (a) Li_2O (b) N_{O2}

   (c) O_2 (d) All the above

9. Which of the following carbide reacts with water to give methane gas?

   (a) Calcium carbide   (b) Aluminium carbide

   (c) Chromium carbide   (d) None

10. The molecular formula of borazine is

   (a) BN   (b) B_2H_6

   (c) $B_3N_3H_6$ (d) None

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PART B ---- (5 X 5 = 25marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

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11. (a) Write the Schrodinger wave equation. What are its applications ? (Or)

   (b) Define orbital. Explain the dual nature of matter .

12. (a) Define electron affinity and ionisation energy. How are the above

       Periodic properties vary in the group and period ? (Or)

   (b) Define electronegativity. How is it determined by Mulliken's scale ?

13. (a)   Explain Fajan's rule.(Or)

   (b) Explain the paramagnetic property of O_2 molecule by MO diagram .

14. (a) Explain the position of hydrogen in the periodic table .(Or)

   (b) Explain :

    i.   Hydration energies and
    ii.   Complexation tendencies of s – block elements .

15. (a) Draw the structure of silicones and silicates.(Or)

   (b) Explain the anamolous behaviour and diagonal relationship of p- block

      elements.

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PART C --- (5 X 8 = 40marks)

Answer ALL questions , choosing either (a) or (b)

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Each answer should not exceed 600 words .

16. (a) Explain the quantum numbers and their significance.(Or)

    (b) Write notes on :

        (i) Significance of

        (ii) de Broglie equation .

17. (a) Explain the classification of s,p,d and f – block elements.(Or)

    (b) Explain the following :

        (i) Determination of electronegativity by Pauling method

        (ii) Variation of atomic and ionic radii along groups and periods .

18. (a) Write notes on :

        (i) Properties of ionic compounds

        (ii) Born -Haber's cycle. (Or)

    (b) (i) Explain VSEPR theory with examples .

        (ii) What are the differences between Valence Bond and molecular

             orbital theories ?

19. (a) Explain the general characters of s- block elements. (Or)

    (b) What are the typed of hydrides ? Explain their general methods of

        Preparation and salient features .

20. (a) Explain the preparation , properties and bonding in diborane .(Or)

    (b) Write notes on :

        (i) Interhalogen compounds

        (ii) General characteristics of p- block elements .

NOVEMBER 2017

First semester

Chemistry ---- Main

PHYSICAL CHEMISTRY ---- 1

(For those who joined in July 2016 and afterwards)

Time : Three hours   Maximum : 75 marks

PART A ---- (10 X 1 = 10 marks)
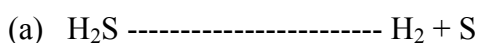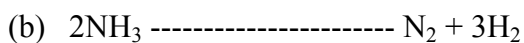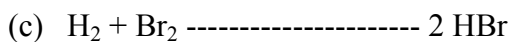
Answer ALL the questions
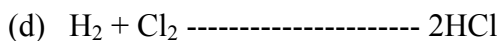
Choose the correct answer .

1. Which of the following has maximum value mean free path

    (a) Co_2 (b) H_2

    (c) O_2 (d) N_2

2. The relation for root mean square velocity is

    (a)   (b)

    (c)   (d)

3. The quantum yield of which of the following processes is very high ?

    (a) H_2S ----------------------- $H_2 + S$ (hv above arrow)

    (b) $2NH_3$ ---------------------- $N_2 + 3H_2$ (hv above arrow)

    (c) $H_2 + Br_2$ --------------------- $2\,HBr$ (hv above arrow)

    (d) $H_2 + Cl_2$ --------------------- $2HCl$ (hv above arrow)

4. A solution of chlorophyll in ether shows the fluorescence colour

    (a) blood red   (b) green

    (c) violet   (d) yellow

5. Complete the following nuclear reaction with suitable particle in the place

of x

$$Co_{27}^{50} + x \text{ ----------------------} \quad Co_{27}^{60} + X_1^1$$
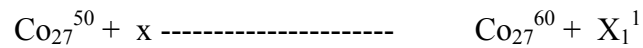
(a) H_1^1 (b) D_1^2

(c) n_0^1 (d) H_1^3

6. Which one of the following actinide element is not used as nuclear fuel ?

    (a) U – 235   (b) Th – 234

    (c) Pu – 239   (d) Lw

7. bcc type structure is present in

    (a) NaCl   (b) CsCl

    (c) Both (a) and (b)   (d) None

8. Number of atoms in different unit cells of monoatomic substance is

    (a) simple cubic – 1   (b) bcc – 2

    (c) fcc – 4   (d) all are correct

9. The symbol represents Van't Hoff factor is

    (a) k   (b) i

    (c) J   (d) K

10. The method used to determine the boiling point elevation is

    (a) Cottrell's method

    (b) Berkeley – Hartley method

    (c) Ostwald – Walker method

    (d) Beckmann method

PART B ----- (5 X 5 = 25 marks)

Answer ALL questions , choosing either (a) or (b) .

   Each answer should not exceed 250 words .

11. (a) What is equipartition principle of energy ? explain it.(Or)

                          (b) State Maxwell's law of distribution of molecular velocities,

       explain the terms in it . Give the graphical representation and

       explain the feature .

12. (a) What is quantum yield ? Explain one experimental method to
       determine it .

                           Or

   (b) State the difference between fluorescence and phosphorescence .

13. (a) Explain the term mass defect and binding energy

                           Or

   (b) Write notes on :

       (i) Radioactive hazards

       (ii) n/p ratio .

14. (a) Write a note on Bravais lattices and seven crystal systems .

                           Or

   (b) How is the structure of a crystal determined by rotating

       crystal method ?

15. (a) Describe a method of determination of osmotic pressure of a

       sugar solution .

                           Or

   (b) Derive the Raoult's law equation for the relative lowering of

       vapour pressure .

                PART C ---- (5 X 8 = 40marks)

   Answer ALL questions , choosing either (a) or (b) .

    Each answer should not exceed 600 words .

16. (a) (i) Write a note on viscosity of gases .

       (ii) At 15° C and 740 MM pressure viscosity of CO_2 gas is 1.72×10^{-4}

           poise. Calculate its mean free path and collision diameter .

                           Or

   (b) (i) Define collision number , collision diameter and mean free

           path .

       (ii) Calculate the average velocity of H_2 gas at 0°C .

17. (a) Derive an expression for the photochemical rate law . Discuss the

       Kinetics of the following photochemical reaction .

$$\text{H}_2 \text{ (g)} + \text{Br}_2 \text{ (g)} \xrightarrow{\;h\nu\;} 2\text{HBr (g)}$$

Or
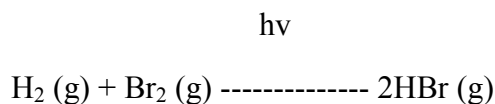
(b) Explain the following :

    (i) Grothus – Draper's law

    (ii) Stark – Einstein law

    (iii) Photosensitization .

18. (a) (i) Distinguish atom bomb and hydrogen bomb .

    (ii) Write a note on atomic reactors .

Or

(b) How are the radioactive isotopes used in

    (i) Radio carbon dating

    (ii) Photosynthesis

    (iii) Hydrolysis of ester   and

    (iv) Medicine .

19. (a) (i) Discuss the crystal structure of NaCl.

    (ii) Write a note on crystal defects.

Or

(b) (i) Derive Bragg equation.

    (ii) How is Avogadro number determined using crystallographic data ?

20. (a) (i) How is the molecular mass determined by boiling point elevation method .

    (ii) Write a note on abnormal molar mass .

Or

(b) Write notes on :

    (i) Laws of osmotic pressure

    (ii) Van't Hoff factor .

U.G (CBCS) DEGREE EXAMINATION

NOVEMBER 2017

First semester

Part IV

ENVIRONMENTAL STUDIES

(For those who joined in July 2008 and afterwards)

Time : Three hours   Maximum : 75 marks

PART A ----- (10 X 1 = 10 marks)

Answer ALL the questions

Choose the correct answer.

1. Which produces the maximum commercial energy in the world ?

   (a) Hydro electric

   (b) Thermal

   (c) Fossil fuels

   (d) none of these

2. ----------------------- is famous for coal and lignite in Tamil Nadu

   (a) Tuticorin   (b) Salem

   (c) Neyveli   (d) Thanjavur

3. The term ecosystem was proposed by

   (a) Karl Mobius   (b) S.A Forbes

   (c) Friederichs   (d) A.G.Tansley

4. Find out the odd one: micro consumers are also called as

   (a) decomposers   (b) reducers

   (c) detritivores   (d) producers

5. Indira Gandhi National park is located in the

   (a) Nilgiri hills   (b) Thirunelveli hills

   (c) Cardamom hills   (d) Anaimalai hills

6. Which region in peninsular India is a biodiversity hotspot in the world?

    (a) Deccan plateau   (b) Eastern ghats

    (c) Western ghats   (d) None of these

7. Red tide is formed by

    (a) blue green algae   (b) fungi

    (c) brown algae   (d) dinoflagellates

8. Major sources of gaseous pollutants are

    (a) cement factories

    (b) petroleum refineries

    (c) chemical industries

    (d) sugar mills

9. Since the early 20th century, Earth's mean surface temperature has

    increased by about ------------------

    (a) 0.6°C   (b) 0.7°C

    (c) 0.8°C   (d) 0.9°C

10. In which year, Tamil Nadu government has banned manufacturing

    of less than 40- micron thickness of plastic bags

    (a) 2010   (b) 2011

    (c) 2012   (d) 2013

PART B ----- (5 X 5 = 25marks)

Answer ALL questions choosing either (a) or (b)

Answer should not exceed 250 words

11. (a) Cite the world food problems with examples

Or

    (b) Define the benefits of alternate energy needs.

12. (a) Differentiate between forest and grassland ecological pyramids.

Or

    (b) Comment on the diagnostic features of estuaries.

13. (a) Cite ecosystem diversity with example.

Or

(b) How the plant biodiversity plays major role in keeping the clean environment?

14. (a) What are the effects of soil pollution?

Or

(b) Write down the disaster of landslides.

15. (a) Comment on the types of wastelands.

Or

(b) Deforestation depletes ozone --- Justify.

PART C ----- (5 X 8 = 40marks)

Answer ALL the questions choosing either (a) or (b)

Answer should not exceed 600 words

16. (a) Define desertification with examples.

Or

(b) What are the effects of modern agriculture?

17. (a) Discuss elaborately desert ecosystem.

Or

(b) Narrate ecological succession.

18. (a) Give an account on global biodiversity.

Or

(b) Explain ex-situ conservation with examples.

19. (a) What are the effects of water pollution?

Or

(b) Write in detail about the disaster of earthquakes and cyclones.

20. (a) Explain the impacts of global warming.

Or

(b) Explain the protective measures extended by Air (Prevention and control of pollution) Act.

Code.No:21108
Sub.code:JACH3A

B.Sc(CBCS) Degree Examination ,

November 2017

Third Semester

Skilled Based Subject-Agro Chemistry

 Time:Three hours   Maxmimum :75 marks

Choose the correct answer :

1. The macro nutrient among the following is

1.Boron 2. Nitrogen 3.Copper 4. Manganese.

2. The expansion of NP is

S1. Nitrogen,Potassium 2.Nitrogen, Promethium 3. Nitrogen, Phosphorus 4. None.

3. BHC represents

1.Benzene hexachloride 2. Gammexane 3. Both (a) and (b) 4. None4.

4. The example for inorganic pesticide is

1. DDT 2. BHSC 3.BORATES 4.NONE.

5. The major soil type in Tamil Nadu is.

1.Clay soil 2. Alluvial soil 3.laterite soil 4. Red soil

6. Among primary minerals most resistant to weathering is

1. gypsum 2. Albite 3. Olivine 4. Quartz.

7. Which of the folllowing type soil has poor physical condition?

1. salilne soil 2. Alkaline soil 3. Acid soil 4. None

8. Which salt is present in large amount in alkali soil

1. calcium chloride 2. Sodium carbonate 3. Sodium bicarbonate 4. Magnesium sulphate

9.The method used to measure the acidic and basic nature of soil is

10. Molybdate reagent is used for the estimation of

1. nitrogen 2. Phosphorus 3. Boron 4.calcium.

PART B

ANSWER ALL QUESTIONS:

11. Describe the role of micro nutrients in plant growth. (Or)

Write a note on mixed fertilizers and biofertilizers.

12. Write the advantage and disadvantages of organic pesticides. (Or)

Write a note on fungicides.

13. Write a note on rock systems. (Or)

Explain the factors favouring soil formation.

14. Explain about the properties of soil colloids. (Or)

Explain soil texture triangle.

15. Explain despatch of soil samples for testing.

Explain the collection process of soil sample for soil testing.

PART-C

16. Howurea and triple super phosphate are manufactured? (Or)

Write notes on:

1. oil cake 2. Fish manures. 3. Composting process.

17. Write notes on:

1. Bacteriocide. 2. Fungicide 3. Inorganic pesticide. (Or)

Give the preparation of Bordeaux mixture, DDT AND BHC.

18. Write notes on:

1. layers in a soil profile. 2.Biological weathering of rocks. (Or)

Explain the main components of soil and soil formation.

19. Explain the methods to reclaim the acid and alkaline soils. (Or)

Explain how air and soil temperature influence the plant growth.

20. Explain the determination of available phosphorus in soil. (Or)

How is the available nitrogen in soil sample determined?

B.Sc(CBCS) Degree Examination ,

November 2017

Third Semester

Chemistry-Main

ORGANIC CHEMISTRY_11

Time:Three hours   Maxmimum :75 marks

PART –A

CHOOSE THE CORRECT ANSWER:

1. The aldehyde which is used to prepare primary alcohol from Grignard reagent is

1.HCHO 2. CH_3CHO 3. CH_3CH_2CHO 4. $CH_3CH_2CH_2CHO$

2. The carbonyl compound which does not undergo aldol condensation is

1.HCHO 2.CH_3CHO 3. CH_3COCH_3 4. $CH_3COCH_2CH_3$

3. Which of the following is more acidic?

1. CH_3COOH 2. $ClCH_2COOH$ 3. $Cl_2CHCOOH$ 4. CCl_3COOH

4. On heating lactic acid gives

1. Lactones 2. Oxalicacid 3. Lactide 4. Glycol

5. During the preparation of Grignard reagent the one which cannot be used as a solvent is

1. Ether 2.water 3. Alcohol 4. All the above

6. Mustard gas is prepared from

1. SCl_2 2. SCl_2 3. SCl_2 4. Ethene +Methane

   Methane   Ethane   Ethene $COOC_2H_5$

7. The name of the compound which has the structure

                                                                $COOC_2H_5$

1.Malonate 2. Diethyl malonate 3. Dimethyl malonate   4. Ethyl aceto acetate

8. The keto form is more stable. It is because

 1. C=0 is stronger than C=C

 2. C=C is stronger than C=O

3. C-O and C=C in equilibrium

4. Both C=C and C=0 are weaker

9. The IUPAC name of alicyclic compounds used to prefix with

 1. cyclic 2. Cyclo 3. Alicyclo 4. None of the above

10. Identify the incorrect statement regarding cyclo alkane.

 1. There are sp^3 hybridised carbon

 2. They have tetrahedral bond angles

 3. Stability varies directly with size

 4. These undergo nucleophilic substitution reaction

PART-B

11.Explain the knoevenagel reaction mechanism(Or)

Write down the wolf-kishner reduction with mechanism.

12.How is citric acid prepared? Give any three properties and uses of citric acid. (Or)

 Explain briefly the mechanism of ester hydrolysis

13. How are the following prepared?

 1. Methyl lithium 2. Diethyl zinc 3. Tetraethyl lead. (Or)

CH_3Li^+ ⟶ Lithium acetate

1.Which is obtained when CH_3Li reacts with zirconium chloride?

2. Which is obtained when tetraethyl lead is oxygenated?

14.Write down the preparation of diethyl malonate and ethyl acetoacetate(Or)

 Explain briefly the oxime –nitrosotatuomerism

15. Write down the general preparation of cycloalkanes. (Or)

 Briefly explain the conformations of cycloalkanes

PART-C

ANSWER ALL

16. Write down the preparation,properties and uses of acrolein(Or)

 What are aldol and crossed aldol condensation?

17. What is Hell – Volhard – Zelinsky - reaction? Explain its mechanism. (Or)

 1. How are oxalic acid and succinic acid prepared?

 2. Give the preparation and structure of urea.

18. Write down the preparation, structure and synthetic uses of Grignard reagent. (Or)

Write a note on the following:

1. Reformatsky reaction
2. Sulphones

19. Explain briefly the following tautomerism:

1. Keto –enol tautomerism 2.Amido- imidotautomerism. (Or)

Describe briefly the reactivity of methylene groups with suitable examples.

20. Explain briefly the bayer's strain theory. (Or)

Write down briefly the synthesis and structure of civetone and muscone

B.Sc. Degree Examination November 2017

Fifth Semester

ORGANIC CHEMISTRY III (GMCH51)

PART-A

CHOOSE THE CORRCT ANSWER:

1. The essential condition for the optical activity is

(a) Presence of symmetric carbon atom (b) Presence of one sp^3 carbon atom

 (c) Presence of chirality (d) Absence of sp^3 carbon atom

2. Plane polarized light is obtained by passing ordinary light through

(a) a prism (b) rectangular prism (c)a nicol prism (d) a solution of tartaric acid

3. Which one is not ortho,para-director?

(a) –OH (b)-COOH (C)NH$_2$ (d)-OCH$_2$

4. Side chain halogenations of alkyl benzene proceeds through

(a)radical mechanism (b)ion pair mechanism (c)ionic mechanism (d)cyclic electron transfer mechanism

 5.What will be the product formed when 1-aminonaphthalene is oxidized by $KMnO_4/H^+$

(a) 3-amino phthalic acid (b)1,4-naphthaquinone (c)phthalic acid (d)phthalonic acid

6.Which of the following is acidic in nature?

(a)triphenylmethane (b)diphenylmethane (c)toluene (d)benzene

7.Which one of the following undergoes Diels-Alder reaction/

(a)thiophene (b)pyridine(c)pyrrole (d)furan

8.Which one of the following resembles to phenol in properties?

(a)pyridine (b)pyrrole (c)thiophene (d)quinoline

9.Which one is a nitro dye?

(a)picric acid (b)martius yellow (c)crystal violet (d)methyl orange

10. Increased conjugation in chromophore

(a)lightens the colour (b)deepens the colour (c)shifts the absorption to shorter wave length (d)both (a) and (c)

PART-B

11.(a) Differentiate between enantiomers and diastereoisomers.(Or)

(b) Discuss elaborately about absolute asymmetric synthesis with suitable example.

12(a) Discuss briefly the mechanism of aromatic unimolecular nucleophilic substitution reaction. (Or)

(b) Write note on the following reaction aromatic nitration and friedel craft acylation.

13(a)(i) How would you account for the fact,"Naphthalene is more reactive than benzene"?

(ii) What will be obtained when benzophenone is subjected to clemmenson reduction? (Or)

(b)(i) How would you convert napthaquinone into anthraquinone?

(ii)What will be obtained when 1-nitronaphthalene is oxidized by acidified $KMnO_4$?

14(a)(i) Why is furan not stable to acid although it has aromatic character?

(ii) Explain why pyridine does not give friedel craft reaction. (Or)

(b)(i)Compare the basicity of pyridine with that of pyrrole.

(ii) How will you convert furan to pyrrole?

15(a)Write note on valence bond theory related to the colour of the compound. (Or)

(b) How is alizarin prepared?

PART-C

16(a)How would you determine geometrical isomers by physical and chemical methods? (Or)

(b)(i) Assign E,Z notation

$$\underset{H}{\overset{CH_3}{>}}C=C\underset{CH_3}{\overset{H}{<}}$$

$$\underset{H}{\overset{CH_3}{>}}C=C\underset{C_2H_5}{\overset{Cl}{<}}$$
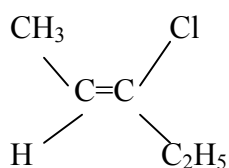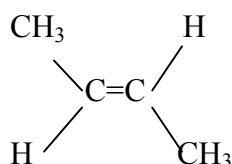
(ii)Assign R,S-Configuration.

$$\begin{array}{c} COOH \\ | \\ H-C-OH \\ HO-C-H \\ | \\ COOH \end{array}$$
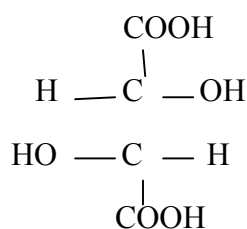
17(a)Write note on ring activating and ring deactivating groups in aromatic compounds. (Or)

(b)(i) Give the benzyne mechanism.

(ii)Give the mechanism for the halogenations reaction.

18(a)Give the reactions of reduction of anthracene under different conditions. (Or)

(b)Elucidate the structure of Naphthalene.

19(a)How will you get the following compound from pyrrole?

(i)2-nitropyrrole (ii)2,5-dihydropyrrole (iii)pyrrolidine(iv)pyrrole-2-sulphonic acid.(Or)

 (b)(i)Electrophilic substitution in pyrrole takes place at 2-position whereas in pyridine at 3-position.Explain.

(ii)What is chichibabin reaction?Give one example.

20(a)What are dyes?How will you classify the dyes on the basis of chemical constitution? (iv)pyrrole-2-sulphonic acid.(Or)

(b)(i)An alcoholic solution of phenolphthalein is colourless but when a drop of alkali is added to it, the solution becomes red-Explain.Why?

(ii) How would you prepare the following dyes? Crystal violet,Bismark brown,Indigo.

PART-A

CHOOSE THE CORRECT ANSWER:

1.Give expansion of SWOT

(A)South West Organisation of Tourism(B)Strengths,Weakness,Opportunities and Threats(C)Study,Worth,Organs and Target (D)Society,World,Opportunity and Trouble

2.Goal setting involves the development of an action

(a)design (b)plan (c)structure (d)object

3.The word perception means

(a) interpretation of sensory information (b)psychology understanding (c)philosophy (d)spiritual

4.------------ is used to evaluate of an object

(a)analyse (b)attitude (c)alternative (d)assess

5.------------is a dialogue between two or more people.

(a)communication (b)speech(c)lecture (d)negotiation

6.Public leadership focuses on the ----------- behaviours.

(a)22 (b)14 (c)34 (d)50

7.Who introduced the concept of transactional analysis?

(a)James Brown (b)Eric Berne (C)Lawrence (d)Jeremy

8.-----------is the common form of stress.

(a)chronic stress (b)acute stress (c)inner stress (d)physical stress

9.Social graces are

(a)policy (b)behaviour (c)skill (d)system

10.Table manners are the rules used while

(a)meeting (b)seminar (c)eating (d)watching

PART-B

11(A)Describe the components of SWOT.(Or)

(B)Mention the importance of goal setting.

12(A)Point out the formation of attitude (Or)

(B)State the system of improbing assertiveness.

13(A)Illustrate the method of creating effective team. (Or)

(B)Summarise the qualification of an effective leader.

14(A)What is emotional intelligence? (Or)

(B)Sketch the causes for stress.

15(A)Trace the process of group discussion. (Or)

(B)Give an note on interview questions.

PART-C

16(A)Enumerate the factors determinants of personality trait. (Or)

(B)Discuss the nature of developing self-awareness.

17(A)Write an essay on the high self-monitor and low level self-monitor. (Or)

(B)Analyse the errors in perception.

18(A)Elucidate the types and common mistakes in negotiation process. (Or)

(B)Examine the definition of conflict management and resolution of conflict.

19(A)Bring out the importance of communication network. (Or)

(B)Illustrate the importance of communication network.

20(A)Assess the social graces and acquiring social graces. (Or)

(B)Describe the Do's and Don't's of table manners.

PART-A
CHOOSE THE CORRECT ANSWER

1.The reaction in which a substance reacts or decomposes in more than one way called (a)parallel reactions (b)irreversible reactions (c)fast reactions (d)reversible reactions

2.Ea is the activation energy then the Arrhenius equation is

(a)$K=A.e^{-ea/rt}$ (b)$K=A.e^{ea/rt}$

(c)$A=K.e^{-ea/rt}$ (d)$A=K.e^{ea/rt}$

3.The standard potential of Ag/Ag^+ half cell is +0.80V and Zn/Zn^{2+} is -0.76V.The E^0 value is

(a)1.56V (b)0.04V (c)-0.04v (d)-1.56V

4.The name of the concentration cell in which the liquid junction potential eliminated is (a)cells without transport (b)cells with transport(c)cells with anion transport (d)cella with cation transport

5.An example for acidic buffer solution
(a)CH3COOH+CH3COONa
(b)NH4OH+NH4Cl
(c)CH3COOH+CH3COONH4
(d)CH3COOH+NaOH
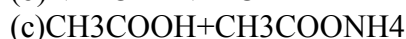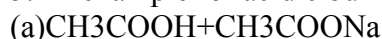
6.When sodium acetate is added to acetic acid,the degree of dissocation of acetic acid
(a)increases (b)decreases(c)does not change (d)becomes zero

7.The transport number of K^+ ion in KClis

(a)0.495 (b)0.505 (c)1 (d)2

8.Equivalent conductance of a solution is given by

(a)1000K/C (b)K/C (c)1000K/M (d)K V^2

9.The number of phases for the MgCO3(s) equilibriumMgO(s)+Co2

(a)one (b)two (c)there (d)zero

10.The phase rule is

(a)F=C-P (b)F=C-p+2 (c)F=C+P-2 (d)F=C-P-2`

Part-b
Answer all the questions choosing either(a)or (b)

11.(a)Explain Lindemann theory for unimolecular reaction.
          Or

   (b)Explain the terms activation energy and energy barrier.

12.(a)What is buffer solution?Explain the buffer action of a basic buffer.

Or

(b)Explain Ostwalds dilution law.

13.(a)Define the terms specific conductance, equivalent conductance and molar conductance. Write the relation between them.

Or

(b)Write and explain Kohlrauschs law.

14.(a)Define oner voltage.How cabn it be prevented

Or

(b)How will you determine the pH of a solution using quinhydrone electrode?

15.(a)What are the application of distribution law?

Or

(b)Explain the phase diagram of water.

Part-c

Answer all question, choosing either (a)or (b)

16.(a)Explain ARRT of bimolecular reactions.

Or

(b)Write notes on:
(I)Temperature effect on reaction rate
(II)Collision theory of unimolecular reaction.
17.(a)Derive Henderson equation
(II)Explain Lewis acid and Base concept

Or

(b)Derive an expression for the hydrolysis constant of a salt of a strong acid and a weak base

18(a)Discuss the moving boundary for the determination of transport number of an electrolyte.

Or

(b)Write notes on:
(I)Ionic product of water
(II)Debye-Huckel-Onsager equation
19.(a)DeriveNernst equcation

(II)Discuss the principle underlying potentiometric titrations.

Or

(b)Write notes on:
(I)Calomel electrode
(II)Redox indicators
20.(a)Explain the phase diagram of sulphur and lead-silver.

Or

(B)(I)Derive phase rule thermodynamically.

(II)Explain the solvent extraction method.

B.SC (CBCS)DEGREE EXAMINATION
NOV-17
Fifth Semester
Chemistry-Main   Elective II-ANALYTICAL
CHEMISTRY

Part-A

choose the correct answer

1. Normal error is also known as
    (a)Precision   (b)Accuary
    (C)Gaussian   (d)Least square curve

2.The liquid fuel found in all alcoholic drinks

(a)Octane   (b)propane   (c)Ethanol   (d)Methonl

3.The formula for confidence interval

    (a)$S_{r1}{}^2+S_{r2}{}^2+S_{r3}{}^2+\ldots$ (b)$x+ts/N$
    (C)$(S+r_1)^2+(s+r_2)^2+\ldots$ (d)$x+ts/N-1$

    4.Both temporary and permanent hardness of water can be removed on boiling water with

(a)Calcium hydroxide (b)Sodium carbonate (c)Calcium oxide(d)Calcium carbonate

5.Which of the following can affect the pHof a body of water
    (a)algae that live in water
    (b)chemicals poured into water
    (c)fish present in water
    (d)minerals in water

6.The most important solid fuel

(a)Wood (b)Diesel   (c)Pertrol   (d)LPG

7.In coulomertic titrations the one which is kept constant using an amperostat is

    (a)current   (b)electric potential ©voltage (d)mass transfer

8.The electrode on which the reaction of interest occurs inan electrochemical system is known as

(a)Calomel electrode (b)Auxilliary electrode (c)Working electrode (d)Plantium electrode

9.The mathematical expression of DTA curve was deduced by

(a)Borchardtand Daniel (b)Duval ©Kettach (d)Lukaszewski

10.The method used to study the voltalisation of constuituends from glasses at higher temperatures

(a).Amporometry (b)Potentiometry   (c)Thermogravimetry (d)Voltammetry

Part-B

Answer all the questions, choosing either (a)or (b)

11,(a) What are the coefficients of variation and vasriation? Discuss them in detail. Or

(b).Write briefly the compuutional rules for the addition substractiondivision and multication of significant figures.

12.(a)What is bacteriological examination of water?What are its types?Or

(b).Write a note on pH and turbidity of water.

13.(a)Explain briefly the heating values and producer gas.
        Or

(b)Explain briefly the moisture content of fuels.

14.(a)Define the term coulometry.List out its uses.
        Or

(b)What is polarography?Give the principle behind the working of DME.

15.(a)Write the characteristics features of TGA.

Or

(b)What is Nephelmetry? Explain its principle and application in detail

Part-c
        Answer all the question choosing either (a(or (b)

16.(a)What are the variousmethod of detection and elimination of systematic errors?Explain them.   Or

(b)Explain the following:

(I) Mode (II)Mean   (III)Standard deviation (IV)Average deviation

17.(a)Elucidateon physical examination of water.

Or

(b)How is water sampling done?How is it preserved?Explain them

18.(a)How is coal classified? Elabrorate.

               Or

(b)Define octane number flash point and volatile matter.Explain in detail.

19.(a)Explain the principle,instrumentation and application of electrogravimetry.

                                                     Or

(b)Explain the principle and application of amperometric   titrations.

20.(a)What is meant by DTA?Explain its principle and uses with examples.

                       Or

(b)Write down the principle , instrumentation and uses of spectrophotometry.

U.G.DEGREE EXAMINATION NOVEMBER 2017

FIFTH SEMESTER

PERSONALITY DEVELOPMENT(GCSB5A)

PART-A

CHOOSE THE CORRECT ANSWER:

1.Give expansion of SWOT

(A)South West Organisation of Tourism(B)Strengths,Weakness,Opportunities and Threats(C)Study,Worth,Organs and Target (D)Society,World,Opportunity and Trouble

2.Goal setting involves the development of an action

(a)design (b)plan (c)structure (d)object

3.The word perception means

(a) interpretation of sensory information (b)psychology understanding (c)philosophy (d)spiritual

4.------------ is used to evaluate of an object

(a)analyse (b)attitude (c)alternative (d)assess

5.------------is a dialogue between two or more people.

(a)communication (b)speech(c)lecture (d)negotiation

6.Public leadership focuses on the ----------- behaviours.

(a)22 (b)14 (c)34 (d)50

7.Who introduced the concept of transactional analysis?

(a)James Brown (b)Eric Berne (C)Lawrence (d)Jeremy

8.-----------is the common form of stress.

(a)chronic stress (b)acute stress (c)inner stress (d)physical stress

9.Social graces are

(a)policy (b)behaviour (c)skill (d)system

10.Table manners are the rules used while

(a)meeting (b)seminar (c)eating (d)watching

<div align="center">PART-B</div>

11(A)Describe the components of SWOT.(Or)

(B)Mention the importance of goal setting.

12(A)Point out the formation of attitude (Or)

(B)State the system of improbing assertiveness.

13(A)Illustrate the method of creating effective team. (Or)

(B)Summarise the qualification of an effective leader.

14(A)What is emotional intelligence? (Or)

(B)Sketch the causes for stress.

15(A)Trace the process of group discussion. (Or)

(B)Give an note on interview questions.

PART-C

16(A)Enumerate the factors determinants of personality trait. (Or)

(B)Discuss the nature of developing self-awareness.

17(A)Write an essay on the high self-monitor and low level self-monitor. (Or)

(B)Analyse the errors in perception.

18(A)Elucidate the types and common mistakes in negotiation process. (Or)

(B)Examine the definition of conflict management and resolution of conflict.

19(A)Bring out the importance of communication network. (Or)

(B)Illustrate the importance of communication network.

20(A)Assess the social graces and acquiring social graces. (Or)

(B)Describe the Do's and Don't's of table manners.

B.Sc (CBCS) DEGREE EXAMINATION-NOV-17

5TH SEMESTER

CHEMISTRY MAIN

ELECTIVE -1 POLYMER CHEMISTRY

PART-A

1. Which one of the following is not a condensation polymer?
   A. Dacron   B. Neoprene
   C. Melamine   D. Glyptal
2. Which one of the following pairs are correct monomers?
   A. Pnemol & Formaldehyde
   B. Polystyrene and butadiene
   C. Dacron & glyptal
   D. Glucose and cellulose
3. Which one of the following method is used to identify the value of Tg?
   A. Thermal mechanical analysis
   B. Ammeter
   C. Potentio metry
   D. Conducto metry
4. The main polymers subjected to vulcanisation are
   A. Poly isoprene   B. Poly vinyl chloride

   C. Poly ethylene   D. Polythene

5. Which process is used to mould thermoplastic materials?

   A. Blow moulding   B. Injection moulding

   C. Extrusion moulding   D. compression moulding

6. The most common type of emulsion polymerization is

   A. oil - in – water   B. oil – in- ethanol

   C. oil – in –methanol   D. water – in –oil

7. Which of the following plastics is most difficult to hurn?

   A. Nylon   B. Polystyrene

   C. Poly vinyl chloride   D. Urea – methanol

8. Thermoplastics differ from thermosetting plastics in the way that

   Thermoplastics are

   A. Bio degradable   B. decomposed under sunlight

   C. resoftened on cooling   D. formed by addition polymerization

9. Which one of the following is the correct silicone structure?

A. (…. Si– o-Si-o-Si-o…..) B. (Si-Si-o-Si)

C. (si-o-o-si) D.(si-si-si)

10. An example for biopolymer is
   A. Cellulose B.oil C. Water D.Ethanol

Part-B

11. What is coordination polymer?Explain in detail. (Or)

Write down the physical properties and application of the   following
   (a)Rubbers(b)fibers

12. Explain any one method for the determination of molecular weight of a polymer. (Or

What is meant by degree of polymerization? Explain.

13. Discuss briefy the emulsion polymerization technique(Or)

Explain briefly the injection moulding.

14. How is poly ethylene prepared? Write down its properties and uses. (Or)

Distinguish between thermosetting and thermo plastics.

15. What are biomedical polymers? Explain briefy. (Or)

What are the factors affecting the conductivity of the conducting polymers?

Part-c

16. (a)How are polymers classified based on structure?What are they?

Explain them in detail. (Or)

Write a note on the following :

(a)chain polymerization (b)Free radical polymerization

17. (a)What is meantby glass transition temperature? What are the factors affecting this? Explain them. (Or)

(b)What is meant by polymer degradation? How are the polymer undergo degradation by thermo ,photo and oxidative degradation?

18. (a)Describe the following polymer processing:

(a)Calendaring (b)Die-casting (c)Rotational casting(Or)

(b)Explain briefly the suspension polymerization and emulsion polymerization.

19. (a)Discuss briefly the preparation and applications of natural and synthetic rubber. (Or)

(b).Give the preparation and uses of the following:

(a)Nylon (b)Polystyrene

20.(a)How are poly pyrrole and poly acetylene prepared? Explain their uses. (Or)

(b)What are silicones?How are they prepared?Give their properties and uses.

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SUB:CODE:PCHM11

Part-A

1. Which among the following is not aromatic?
   (a) Cyclopentyl anion (b) Cyclopentadienyl anion (c) Cyclopropenyl cation (d) cycloheptatrienyl cation

2. Cyclic planar molecules with 4n pi electrons are particularly unstable and are said to be
   (a) antiaromatic   (b) aromatic (c) homoaromatic (d) non-aromatic

3. Hammett equation is applicable to ------substituted compounds.
   (a) aromatic ortho and para
   (b) aliphatic
   (c) aromatic ortho and meta
   (d) aromatic meta and para

4. In the energy profile diagram of a reaction following through SN1 pathway,the state with highest en corresponds to------
   (a) Reactant
   (b) Transition state
   (c) Intermediate
   (d) Product

5. In propanoic acid the methylene protons are said to be --------protons
   (a) homotopic
   (b) enantiotopic

(c) diasteretopic

(d) both(b) and (c)

6. The compound

(a) 2E,4E

(b) 2Z,4Z

(c) 2E,4Z

(d) 2Z,4E

7. The intermediate formed Neber rearrangement is---------

(a) amide

(b) azirine

(c) aryne

(d) acyl nitrene

8. In Fisher-Indole synthesis,the migration of methyl group takes place through---------shift

(a) 1,2

(b) 1,3

(c) 1,4

(d) 1,5

9. Cyclohexane on prevost hydroxylation yields----------product

(a) 100% cis

(b) 100% trans

(c) 50% cis and 50% trans

(d) 60% cis and 40% trans

$$KMnO_4\text{-}NaIO_4$$

10. Stillbene-----------------> ?

The product in the above reaction is--------

(a) Benzyl alcohol

(b) Benzaldehyde

(c) Benzoic acid

(d) Ethyl benzoate

Part-B

11. (a) Give the nomenclature and synthesis of adamantane. (Or)

(b) Writes notes on altarnant and non-alternant hydrocarbons.

12. (a) (i)Explain Hammond postulate with an example.

(ii) Using Hammett equation,calculate the PKa value of m-nitro benzoic acid knowing the PKa value of benzoic acid is 4.2 and sigma m for -NO_2 is +0.71. (Or)

(b) (i) Differentiate between transition state and intermediate.

(ii) Suggest a non-kinetic method to show that the hydrolysis of an ester follows either by acyl-oxygen cleavage (or) by alkyl-oxygen cleavage.

13. (a) Illustrate Prelog's rule with an example. (Or)

(b) Explain stereoselective and stereospecific synthesis each with tw examples.

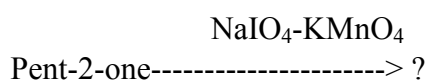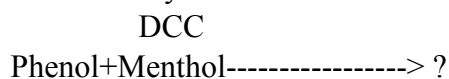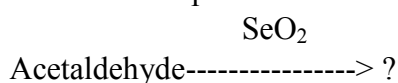14. (a) Formulate, complete and give the mechanism of the following reaction.

$$\text{Salicylaldehyde} \xrightarrow{\text{alkaline } H_2O_2} \quad \text{(Or)}$$
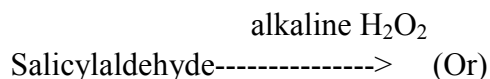
(b) Formulate complete and give the mechanism of the following reaction.

$$\text{Benzil} \xrightarrow[\text{(2) H+}]{\text{(1) KOH}}$$
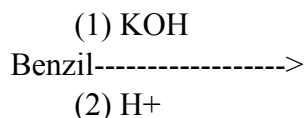
15. (a) What is Umpolung? Write down its application in the synthesis of organic compounds. (Or)

(b) Formulate and complete the following reactions.

$$\text{Acetaldehyde} \xrightarrow{SeO_2} ?$$

$$\text{Phenol+Menthol} \xrightarrow{DCC} ?$$

$$\text{Pent-2-one} \xrightarrow{NaIO_4\text{-}KMnO_4} ?$$

(1) LDA

Part-c

16. (a) (i) Explain the aromaticity of compounds based on M.O theory.Or

(b) Explain the following terms with appropriate examples.
    (i) non-benzenoid aromatic(ii) aromatic annulenes   (iii) antiaromaticity (iv) homoaromaticity

17.(i) Writes notes on fullerenes

(b) How are crossover experiment and stereochemical evidence useful in studying organic reaction mechanism?

18. (a) What do you by partial and absolute asymmetric synthesis? Give any two examples of asymmetric synthesis by enzymatic and catalytic process. (Or)

(b) (i) Write R\S notation for the following compounds.

(ii) Discuss the stereochemistry of an saturated compounds and paracyclophanes.

19. (a) Explain the reaction and mechanism of Von-Richter and Curtius rearrangements. (Or)

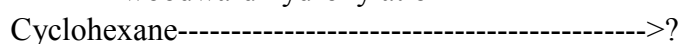 (b) (i) Write down the mechanism of Arndt-Einstert synthesis of ester.
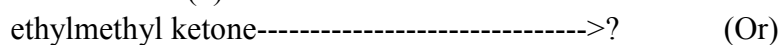   (ii) Formulate and complete and give mechanism for the following reaction.

$$H^+$$
4,4-dimethyl-cyclohexa-2,5-dien-1-one--------------->?
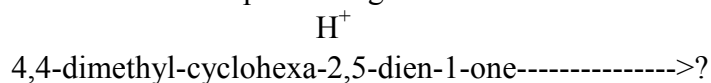
20. (a) (i) Write down the application of vascus catalyst and DCC in organic synthesis.
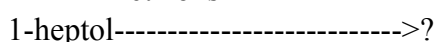   (ii) Formulate and complete the following reaction.

woodward hydroxylation
Cyclohexane--->?

(1) LDA
ethylmethyl ketone------------------------------>?   (Or)
(2) acetone

  (b) (i) Writes notes onMerrifield resin.
    (ii) Formulate and complete the following reaction.

$$OsO_4-NaIO_4$$
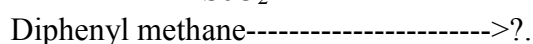Cyclohexane------------------------->?
Fetizons
1-heptol------------------------->?
$$Me_2CuLi$$
p-nitrobenzol chloride---------------->?
$$SeO_2$$
Diphenyl methane---------------------->?.
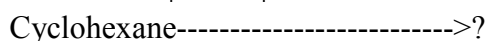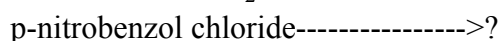
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M.SC(CBCS) DEGREE EXAMINATION

NOVEMBER 2017

First Semester

INORGANIC   CHEMISTRY-1

(For those who joined in July 2017 onwards)

Time: Three hours   Maximum: 75 marks

PART A- (10 x 1= 10 marks)

Answer ALL questions.

Choose the correct answer:

1. What is the percentage s-and p- character of hybrid orbitals if the bond angle between them is 102 degree.
   a) 20.56 and 79.44.
   b) 17.21 and 82.79
   c) 16.25 and 83.75
   d) 25 and 75
2. Which of the following statements is true about π bonds.
   A) π bonds are covalent chemicals bonds, where six lobes of one involved atomic orbitals .
   B) Phi bonding molecular orbital contains three nodal planes
   C) The letter π refers to f-orbitals.
   D) All of the above.
3. Which of the following ions can be oxidized by MnO_4 ion in acidic medium.
   1) Fe^{2+} 2) Cl^- 3) $3e^{3^=}$ (Given ; the standard potential for MnO^{4-} to Mn^{2+} to Mn^{2+} in acidic medium is $+ 1.51$ V)
   A) 1,2,and 3.
   B) 1 and 2
   C) 1 and 3
   D) 2 and 3

4.Arrange the following ions in the order of increasing activity: $(Na(OH_2)_6)$ ^3+, < ($Sc(OH_2)_6$)$^{3+}$, $(Mn(OH_2)_6)^2$

a) $Na(OH_2) n < Ni (OH_2) 6$ ^2< $Mn (OH_3)_6 <$ Sc (OH_2) $_6$)^3+

b) $Na(OH_2)_6 < Mn (OH_2)_6$ ^2< $Ni (OH_2)_6 < Ni (OH_2)_6$)^3+

c) $Na(OH_2)_6 < Mn (OH_2)_6$ ^2>$Ni(OH_2)_6 <$ Sc (OH_2) $_6$)^3+

d)$Na(OH_2)_6 < Mn (OH_2)_6$ ^2< $Ni (OH_2)_6 <$ Sc (OH_2) $_6$)^3+

5. The coordination numbers of Ti in peroskite and rutile respectively are

a) 4and 6

b) 6 and 6

c) 6 and 4

d) 4 and 4

6. The conductivity of NiO is much lower than that of TiO at $25°$ c . Why.

A) NiO is stochimetric and TiO is non stochiometric.

B) In NiO, d-orbitals are localized on metal whee as in TiO they overlap to form partly filled t_2g band.

C) in NiO , d-orbitals are partly filled but in TiO , it is not

D) none of the above.

7.The magnetic moment calculated for Eu^{3+} is 0 BM , but the observed magnetic moment at room temperature is 3.2 -3.5 BM . The reason is

a) temperature dependent paramagnetism.

b) temperature independent paramagnetism

c) high value of spin orbit coupling

d) quenching of orbital contribution

8. An intense yellow colour of Ce $^{4+}$ ions in solution is due to

 a) d-d transition   b) LMCT

C) MLCT   d) f-f transition

9. The indicator used in the radiometric titration of Ca^{2+} with EDTA

A) 110 AgIO$_3$ B) 46 EBT

C) 51 Cr   d) 55 Mn

10. The concentration of 235 u in fuel used in enriched uranium reactor is

a)0.72%   b)-3.5 %

c)9%   d 25%

PART-B

Answer ALL questions by choosing either (a) or (b)

Each answer should not exceed 250 wards.

11. a) what do you mean by walsh diagram. Draw walsh diagram for a triatomic molecule and explain how it accounts for bond angles in BeH$_2$ and H$_2$O molecules.(Or)

b) Calculate the value for the lattice energy of potassium chloride using the Kapustinkii equation. Compare this with the value that you calculated from the given thermodynamics data.

Delta H atm (K,S) =89.1,I1 (K)=418, ½ D (CL-CL) = 122,-EA(CL)= -349, delta

H$_f$ (KCl,s) = -436.7   (All in Kj/mole)   (Given z$^+$ = 1,z- = 1, 152 pm, rcl - = 167pm,v= 2).

12. (a) what is leveling and differentiating solvents.Explain with suitable examples.(Or)

b) In the light of HSAB concept , explain

 1) Symbiosis and

2) Irving William

13. a) Explain with diagrams the difference between the Frenkel and Schootky defects.   What are the conditions for the formation of these defects.(Or)

b) How is band theory account for the optical   electrical properties of semiconductors.

14. a) The colour of lanthanides with f^n and f^{14-n} configurations are the same.Discuss

<div align="center">(Or)</div>

b) How is plutonium extracted from the spent fuels of nuclear reactors.

15.a) calculate the power produced in a power reactor, which contains 5 kg of 235 U in a neutron flux of 5.2×10^{13}. The volume of reactors is 3.5 cubic meters.(Or)

b) 1) writer a note on nuclear cross-section.

2) 238 U emits two types of alpha particles , one with the energy of 4.13 MeV and the other with energy of 4.18 MeV. Give reasons.

<div align="center">PART-C- (5*8=40 MARKS)</div>

Answer ALL questions by shoosing either a and b

Each answer should not exceed 600 words.

16.a) with suitable diagrams explain linear combinations of atomic orbitals in sp, sp^2 and sp^3 hybridisation and give the normalized wave functions and stereochemistry of the hybrid orbitals. (Or)

b) Molecular orbital theory is successful in explaining the bonding in triatomic molecules.Taking Be_2H_2 and Co_2 examples prove this statement.

17.Among for the following

1) A solution of sodium in liquid ammonia appears blue in colour

2) OH- is a weak base compared NH_2-

3) HF is a poor solvents for salts.

4) The variation in the strength of the acids in the series $H_2O<H_2S<H_2Se<H_2Te$. (Or)

b) with examples explain the following reactions that occur in liquid SO_2.

1)Acid-base reaction

2) complex formation

3) solvolytic reaction

18.a)1) what are super conductors. Explain different types of high temperature superconductors with transition temperatures achieved.

2) write short notes on meissner effect and levitation.(Or)

b) Bring out the differences between the structures of the following pairs.

1) zinc blende-wurtzite

2) flurite –antiflurite

3) rock salt-CsCl.

2) What are non-stochiometric compounds. Give examples. Discuss the different ways by which non-stochiometry may result in chemical compounds.

19) a) 1) Describe tge magnetic behavior of lanthanides and actinides. Calculate us and YB^{3+}.

2) write a note on the use of lanthanides complexes as shift reagents. (Or)

b) what are the main problems encountered in the separation of lanthanides.How are they 0vercome .Discuss the method of extraction of lanthanides from one of the ores.

20.) a) 1) Assuming asymmetric fission of Fm_{250} find the fission energy released. The atomic masses Fm_{100}^{250}= 250.0795amu , Sn_{50}^{125} = 124.9077amu.

2)The Q Value for the reaction "B(ALPHA AND BETA$^{)^{12}}$ B" is 1.136MeV. Find the threshold energy for the reaction.

3) Explain stripping and fragmentations reactions with examples. (Or)

b) Discuss the principle and applications of neutron activation analysis.

Code No: 9079   Sub . Code:PCHM 13

M.SC.(CBCS) DEGREE EXAMINATION

NOVEMBER 2017

First Semester

PHYSICAL CHEMISTRY-1

(For those who joined in July 2017 onwards)

Time: Three hours   Maximum: 75 marks

PART A- (10* 1= 10 marks)

Answer ALL questions.

Choose the correct answer:

1.Chemical Potential is defined as

(a) $u_i=(dG/dn_i)$ t,p $n_1,n_2, ... n_{i-1}$

(b) $u_i=(dE/dn_i)$ S,V,$n_1,n_2,... n_{i-1}$

(c) $u_i=(dA/dn_i)$T,V,$n_1,n_2,... n_{i-1}$

(d)All the three

2. Gibbs Duhem -margules equation is

(a) $x_1/p_1 (dp_1)/(dx_1)= x_2/p_2 (dp_2) / (dx_2)$

(b) $n_1du_1 + n_2du_2=0$

(c) $u_i= (dG/dn_i)T,P,n_1,n_2... n_{i-1}$

(d) $dG = -SdT + VdP + Eu_i du_i$

3. what is the degree of freedom of a system of a system with pure water

(a) 2   (b) 4

(c) 5   (d) 7

4. In a single-component condensed system, if degree of freedom is zero, maximum number of phases that can co-exist.

(a) 0   (b) 1

(c) 2   (d) 3

5.Wave function in quantum mechanics represents

(a) A state of the system

(b) Shape of the system

(c)Probability of the system

(d) Energy of the system

6. Which of the following is incorrect about the de-Broglie relationship

(a) $h = lamda * p$ (b) $h/v = lamda * m$

(c)kinetic= hv/2lamda   (d)kinetic=2hv/lamda

7. The entrophy -------- with increasing molar mass.

(a) increases   (b) decreses

(c) increases and decreases   (d) is constant

8.The unit of Partition Function is

(a) s^{-1} (b) $JKg^{-1} mol^{-1}$

(b) $JK^{-1} mol^{-1}$ (d)None

9.Which of the following molecules give the rotational spectra.

$H2, HCl, CH_4, CH_3Cl, Co$, and O_2

(a)HCl, CH_3Cl, Co

(b)HCl, CH_4, CH_3Cl, Co

(c)HCl, Co, O_2

10. Match the spectral techniques in List 1 and with the regions given in the

List 1   List 2

1) Vibrational spectroscopy   a) Microwave
2) Electronic spectroscopy   b) radiofrequency

3) Rotational spectroscopy   c) Infrared
4) Nuclear magnetic spectroscopy   d) Ultraviolet visible

A) 1-c,2-d,3-a, 4- b
B) 1-d,2-c,3-a, 4-b
C) 1-c,2-d,3-b,4-a
D) 1-b,2-d,3-a,4-c

PART-B

Answer ALL questions by choosing either (a) or (b)

Each answer should not exceed 250 wards.

11. (a) How can you determine the fugacity of a gas by compressibility factor method. (Or)

(b) Find rhw Fugacity of hydrogen at 100 ° C , at 300 atmosphere using the approximate relation i.e ., $\ln_f = \ln_p - (ap/RT^{2}) + (bp/RT)^{+}abp/2 \ (RT^{2})$. Given that a = 0.244 dm^{6} atm . mol^{-2}, b=0.0266 dm^{3} mol^{-1}.

12. (a) Derive the phase rule from the concept of chemical potential.(Or)

(b) what is irreversible thermodynamics . State the postulate of local equilibrium.

13. (a) Discuss the planck 's quantum theory.(Or)

(b) Explain the orthogonality and normalizations of wave functions.

14. (a) compare the important features of Maxiwell – Boltzmann , Bose-einstein and Fermi-Dirac statistics.(o)

(b) (1) what is Ergodic hypothesis

(2) what is an ensamples. Explain.

15.(a) why are pure rotional spectra studied only in the gaseous states of atoms and molecules. (Or)

(b) Discuss the effect of isotopic substitution.

PART-C- (5*8=40 MARKS)

Answer ALL questions by choosing either a and b

Each answer should not exceed 600 words.

16. (a) What would be the reduction in chemical potential of toluene at 25 degree celcius when a solute is added at a mole fraction of 0.28.

Or

(b) (1) Calculate the chemical potential

(2) Discuss the method of determination of partial molar volume from apparent molar method.

17. (a) Discuss the electro kinetic and thermo mechanical effects of irreversible thermodynamics.

Or

(b) Verify the validity of Onsagar reciprocal relationship.

1   18. (a) Discuss the postulates of quantum mechanics. (Or)

(b) (1) State Heisenbergs uncertainty principle.

(2) Prove the Heisenbergs uncertainty principle using non commuting   property of position and linear momentum operators.

19. (a) (1) What are bosons and Fermions. Give examples.

(2) write notes on negative Kelvin temperature. (Or)

(b) Calculate the possible ways of distribution of 2 particles among four energy states, when

(1) particles are indistinguishable and there is no restriction on the occupancy of the energy states (Boltzons)

(2) particles are indistinguishable (correceted Boltzons)

(3) particles are Fermions.

(4) particles are Bosans.

20. (a) Explain the occurance of pure rotational spectrum for linear symmetric top molecules. (Or).

(b) (1) How are molecules classified into groups according to the relative values of their three principle moments of inertia. Give one example for each.

(2) Discuss the kinetics energy of rotation in rigid rotator model.

Choose the best answer

1.Consumer microwave ovens usually use

(a) 2.45 GHz   (b) 245 GHz
                   (d)   2450
(c) 24.5 GHz   GHz

2.The atom economy is maximum in
   (a)   elimination   (b)   substitution
reactions   reactions
   (c) rearrangement reactions (d) none of these

3. Box shaped graphene are
   (a)   one
dimensional   nan (d) none of
structure   these

4. Quantum dots are
                   (b)   nano
   (a) nano wires   tubes
   (c) nano particles   (d) none of these

5. Passivation is not seen with
   (a) aluminium   (b) titanium
   (c) silicon   (d) iron

6. Rusting in the formation of
                   (b)   iron
   (a) iron oxide   tungustate
                   (d) nome of
   (c) ferric cyanide   these

7. The operational pressure employed in HPLC is of the order of
                   (b)   50-350
   (a) 0-10 bar   bar
                   (d) none of
   (c) 500-1000 bar   these

8. What is measured during the aperometery studies?
   (a) changes in the electrical voltage
   (b) changes in electric current
   (c)bchanges in the concentration of the solution
   (d) changes in the color by spectrometer

9. Fissile elements that are capable of nuclear fission are
   (a) uranium-235 and plutonium-239
   (b) uranium-235 and plutonium-238
   (c) plutonium-238 and plutonium-239
   (d) all the three

10. Photo voltaics is term related to the conversion of
   (a) light into electricity
   (b) electrity into light
   (c) both light electricity and electriciy to light
   (d) neither light to electricity nor electrity to light

Part-B

11. (a) Explain what is meant by atom economy.

(or)

(b)In what way microwave initiated reactions are superior to conventional reactions?

12. (a) Discuss the evaporation and sputtering methods of synthesising nano particles.

(or)

(b) Describe the borohydrate reduction method of generating nano particles.

13. (a) Discuss the origion of corrosion

or

(b) Describe the weight loss method related to corrosion

14. (a) Write the importance of flame emission spectroscopy.

or

(b) Explain the applications of coloumetry.

15. (a) What are the options available for the storage of hydrogen?

or

(b) Discuss the high temperature electrolysis method of generating hydrogen.

Part-C

16. (a) List out the twelve principles of green chemistry and describe their relevance.

or

(b) Write notes on:
(i) Need for green chemistry
(ii) Microwave employed condensation reactions.

17. (a) Indicate the applications of nano particles and nano materials.

or

(b) Discuss the properties of nano particles.

18. (a) Explain how corrosion inhibitors are classified. Discuss in detail.

or

(b) Discuss the details regarding the corrosion monitoring methods.

19. (a) Discuss the theory and practical applications of atomic absorption spectroscopy.

or

(b) Highlight the role of cyclic voltammetery as an excellent electro analytical technique.

20.(a) Write note on fuel cells.

Or

(b) Discuss the application and advantages of solar energy.

Code No:8852   Sub. Code: KCHM 32

M.Sc (CBCS) DEGREE EXAMINATION

NOVEMBER 2017 .

Third Semester

Chemistry

INORGANIC CHEMISTRY - III

(For those who joined in july 2016-2017)

Time : Three hours   Maximum : 75 marks

PART A- (10 × 1 =10)

Answer ALL question.

Choose the correct answer:

1. Hexacarbonyvanadium, $(V(CO)_6)$, which is a paramagnetic and 17- electron stable molecule, does not dimerize to form $V_2(CO)_{12}$, an 18- electron species. What is the reason?
   (a)   The coordination number increases to 7
   (b)   Too much steric hindrance to allow stability
   (c)   Ligand repulsion may provide a kinetic $_{baffler}$ to dimerization
   (d)   All the above

2. Which among the following metallocence is ionic?
   (a) $(C_5H_5)_2$ Cr   (b) $(C_5H_5)_2$ Fe

   (c) $(C_5H_5)_2$ Mg   (d) $(C_5H_5)_2$ Mn

3. The term `agostic` in organometallic chemistry refers to

   (a) oxidative addition

   (b) reductive elimination

   (c) covalent interaction between C-H groups   and transition metal centers

   (d) coordination unsaturation

4. $[RC(=O)Fe(CO)_3PPh_3]^-+Cl_2 \rightarrow X +H_2O \rightarrow Y$ What is X and Y?

   (a) RC(=O)R` and RCOOH

   (b) RC(=O)Cl and RCOOH

(c) RCHO and RCOCL

(d) None of the above

5. The ^1H NMR spectrum of the complex Hyridotetrakis-(triphenylphosphine) nickel(II) ion $[HNi(PPh_3)_4]^+$, is aquintet in the intensity ratios 1:4:6:4:1 what would be the shape of the molecule?

(a) Trigonal bipyramid   (b) Square pyramid

(c) Square planar   (d) Tetrahedron

6. The characteristic feature of an electron spin resonance spectrum of frozen aqueous solution of $CuSo_4.5H_2O$ at 77K is

(a) $g_\parallel > g_\perp$ (b) $g_\parallel < g_\perp$

(c) $g_\parallel = g_\perp$ (d) $g_\parallel \neq g_y \neq g_z$

7. In atomic emission spectroscopy, protective agents prevent interference by preferentially forming stable but volatile species with the analyte. The reagent(s) used for this purpose is (are)

(a) EDTA

(b) 8-hydroxyquinoline

(c) Ammonium salt of I-pyrrolidine-carbodithioc acid

(d) All of the above

8. Pick the correct statement about Atomic Absorbtion Spectrometry (AAS) from the following:

(a) H_g lamp is not suitable source for AAS

(b) Graphite furnace is the best atomizer for AAS

(c) Non- metal cannot be determined with AAS

(d) AAS is better than ICP-AES for simultaneous determination of metal ions.

(a) A,B and C   (b) B,C and D

(c) C,D and A   (d) D,A and B

9. A catalyst used in the photoreduction of CO_2 to H_2O is

(a) $[O_S(bpy)_3]^{2+}$

(b) $[(C_5H_5)_2Cr]$

(c) $[Fe(bpy)_3]^{2+}$

(d) $Re(CO)_3(bpy)Cl$

10. The essential conditions for a photochemical reaction to be used in the

storage of solar energy is are

     (a) The reaction must be reversible and the back reaction must be slow at ambient temperature

     (b) The reaction should be endergonic

     (c) The back reaction should proceed rapidly by a catalyst or heat

     (d) All of the above

PART B-(5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) 0r (b)

Each answer should not exceed 250 words.

11. (a) Berryllocene has slipped sandwich structure with ionic character. Substantiate this statement.

Or

(b)   Discuss the preparation, structure and bonding in Zeise`s salt anion.

12. (a) What modification is to be made in the Wilkinson`s catalyst to bring about enentioselective

Hydrogenation of prochiral alkenes?

Or

(b)   Explain the Wacker process of acetaldehyde production from ethylene and Oxygen.

13. (a) predict and sketch the appearance of the ^{31}P-NMR spectrum of both fac- $Rh(PPh_3)_3Cl_3$ and mer- $Rh (PPh_3)_3Cl_3$. [^{31}P: I =1/2 (100%); ^{103}Rh: I=1/2 (100%)]

Or

(b)   What is meant by Kramer`s degeneracy? Using this discuss the EPR spectrum of d^3 metal ion. For the complex $Cr(H_2O)_6^{3+}$, 10Dq is is 17400cm^{-1} and g=1.977. Calculate the spin- orbit coupling constant λ for the complex.

14. (a) Compare turbidimetry with nephlometry   outline the use of techniques with an example for each.

Or

(b)(I) Explain inductively coupled Argon plasma source used in atomic adsorption spectroscopy.

    (II) Discuss the principles and applications of atomic absorption spectroscopy.

15. (a) Write briefly on the photosubstitution reaction of Cr(III)

complexes enumeration the role of different excited states involved in these reactions.

Or

(b)Discuss the two principal mechanisms of energy transfer.

PART C – (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Dicuss the preparation, structure and bonding in ferrocene using LCAO-MO approach.

Or

(b)(I) How metal carbonyls are prepared?

(II) Discuss the bonding mechanism in metal carbonyls.

(lll) How IR spectral data support this mechanism?

(IV) Explain the IR data for the following:

Complex	$V_{CO \, Cm}^{-1}$	$V_{M-C \, cm}^{-1}$
$Mn(CO)_6^+$	2090	416
$Cr(CO)_6$	2000	441
$V(CO)_6^-$	1860	460

17. (a) Discuss the carbonylation of methanol, when it is dry and when it has 5% water.

Or

(b)What is Zeifler-Natta catalyst? How is it useful to prepare stereo regular polymer? Explain with mechanism.

18. (a) (I) How is NMR spectroscopy useful in elucidation of the structure of the following compound:

(1) $PF_3(NH_2)_2$

(2) $P_3N_3(CH_3)_2Cl_4.$

(II) How is NMR technique is useful in the study fluxional

organometallic compound?

Or

(b)(I) The EPR spectrum shown below was recorded for a solution of $[(NH_3)_5Co-O-O-Co(NH_3)]^{5+}$. What structural information can be deduced from this spectrum? How might the spectrum be modified if $^{17}O_2$ was used in the preparation of the peroxo-complex?

(II) Describe the applications of EPR spectroscopy in studying the Jahn –Teller distortion in Cu(II) complexes.

19. (a) (i) Bring out the relationship between fluorescence intensity and concentration. How will you estimate Al^{3+} and F^- ions by fluorimetric method?

(ii) Sketch and explain the TGA curve of calcium oxlate monohydrate was subjected to TGA. Calculate the weight loss in various temperature region 100^0c-950^0c.

Or

(b)(i) Why a high concentration of potassium salt is added to standards and samples in flame adsorption and emission methods?

(ii) A solution in an organic solvent generally results in enhanced sensiativity in flame spectrometric methods. Explain .

(iii) Why sharp line source is desirable for AAS?

(iv) Why high temperature nitrous oxide-acetylene flame sometimes required in atomic absorption spectroscopy?

(v) Why the technique of atomic absorption is only limited to metals?

20. (a) Discuss the applications of semiconductor based photo electrochemical cells in the storage of solar energy.

Or

(b)(i) State Adamson`s rules. How will you apply these rules to the photoaquation of$[Cr(NH_3)_5Cl_2]$ and of $[Cr (NH_3)_5Cl]^{+.}$

(ii) Compare the photophysical and photochemical properties of $[Ru(bpy)_3]^{2+}$ and $[Fe (bpy)_3]^{2+}$.

Code No:8851   Sub.Code:KCHM31

M.Sc (CBCS) DEGREE EXAMINATION

NOVEMBER 2017.

Third Semester

Chemistry

ORGANIC CHEMISTRY- III

(For those who joined in july 2016-2017)

Time:Three hours   Maximum:75 marks

PART A- $(10 \times 1 =10)$

Answer ALL questions.

Choose the correct answer:

1.The increasing order of reactivity of alkylhalide via S_N2 mechanism is

(a) 1^0halide>2^0halide>3^0halide

(b) 3^0halide>2^0halide>1^0halide

(c) 3^0halide<2^0halide<1^0halide

(d) 1^0halide<2^0halide<3^0halide

2. In the absence of pyridine, the stereo product formed in S_Ni reaction is of _____

Configuration.

(a) 100% retention

(b) 100% inversion

(c) 70% retention+30% inversion

(d) 70% inversion+ 30% retention

3.Which of the following protons will have maximum ` $\delta$ ` value?

(a) Methylene proton

(b) Methine proton

(c) Methyl proton

(d) All of these

4. _____ hybridized carbon appear at the maximum up field in C^{13} NMR.

(a) SP^3 (b) SP^2

(C) SP   (d) All of these

5. The Y-axis of mass spectrum is

(a) m/e values

(b) relative abundance

(c) abundance

(d) none of these

6. Which among the following is not the characters of a metastable peak?

(a) occur at the integral m/e values

(b) relatively of low abundance

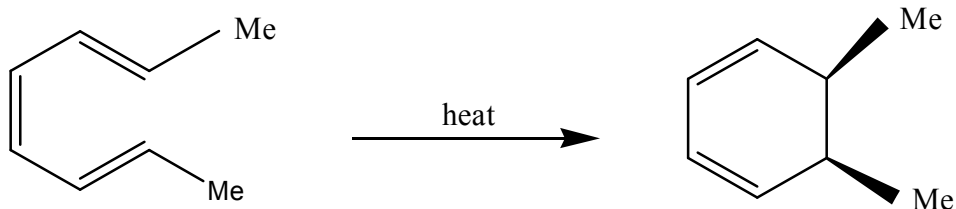(c) much broader than the normal peaks

(d) much sharper than the normal peaks

7. Di-pi methane rearrangement involves

(a) $2\prod+1\sigma$ electrons   (b)$2\prod+2\sigma$ electrons

(c) $1\prod+2\sigma$ electrons   (d) None of these

8.

The above reaction occurs by _____

Electrocyclic ring closure

(a) Thermal con-rotatory

(b) Photochemical con-rotatory

(c) Photochemical dis-rotatory

(d) Thermal dis-rotatory

9. Benzo-2-pyrone is otherwise called _____

(a) Coumarin   (b) Flavone

(c) Pyrimidine   (d) Pyrazine

10. The two glucose units in maltose are joined through _____.

(a) 1st carbon of reducing unit and 4th carbon of non-reducing unit

(b) 2nd carbon of reducing unit and 4th carbon of non-reducing unit

(c) 1st carbon of non-reducing unit and 4th carbon of reducing unit

(d) 2nd carbon of non-reducing unit and 4th carbon of reducing unit

PART B-(5 × 5 = 25 marks)

Answer ALL question, choosing either(a) or (b)

Each answer should not exceed 250 words.

11. (a) Explain the effect of solvent polarity on the rate of aliphatic nucleophilic substitution bimolecular reaction.

Or

(b) Which of the isomers erythro (or) thero-1,2-diphenyl propyl amine will react faster under pyrolytic elimination condition? Give reason?

12. (a) Explain the advantage of DEPT spectroscopy by taking organic molecule as an example.

Or

(b) Give an account on principle and advantages of FT NMR over conventional NMR.

13. (a) Predict the structure of an aliphatic compound of molecular formula $C_5H_{10}O$ Which shows m/e value in mass spectrum at 86, 71, 58, 43. The compound has C=O functionality. Explain the fragmentation pattern.

Or

(b) Write notes on Maldi and FAB techniques.

14. (a) Give an account on photo reduction of benzophenone.

Or

(b) Sketch the Jabalonski diagram and explain internal conversion, inter-system crossing, Flourescence and Phosphorescence.

15. (a) (I) Write down the synthesis of quercetin

(II) What happens when Imidazole reacts with

(1) Benzoyl chloride
(2) $Br_2/CHCl_3$.

(b) Write notes on amylopectin and amylase.

PART C- (5 × 8 = 40 marks)

Answer ALL question, choosing either (a) or (b)

Each answer should not exceed 600 words.

16. (a) Account for the following:

      (I) The acetylenic protons are more shielded compared to that of ethylenic protons.   (3)

      (II) In olefinic system, the coupling constant of Trans protons is always greater than that of cis protons   (3)

      (III) The –OH proton of aqueous ethyl alcohol shows singlet peak (2)

Or

(b) (I) Differentiate o-xylene, m-xylene and p-xylene using H` NMR spectroscopy.   (3)

   (II) [18]-annulene shows two H` NMR signals. Give reason. (3)

   (III) C^{13} NMR signal of quarternary carbon is of low intensity. Give reason.   (2)

17. (a) An organic compound of molecular formula $C_3 H_8 O$ shows the following spectral features.

    UV: no band beyond 205 nm.

    IR: $3000 cm^{-1}$ (s) and $3450 cm^{-1}$ (s)

    H`NMR (δ scale, PPM): 1.6 (sextet,2H); 0.9 (t, 3H); 3.6 (t, 2H); 3.2 (S, 1H)

    Mass: Molecular ion peak m/e at 60, and base peak m/e at 31.

    C^{13} NMR: The OFF resonance proton decoupled C^{13} NMR shows three peaks-two triplet and one quartet peaks. Identify the structure of the compound.

Or

  (b) (I) State Nitrogen rule. Explain the fragmentation pattern for a aromatic ketone of molecular formula $C_9H_{10}O$ with m/e at 134, 119, 92, 65, 51 and 43.   (5)

      (II) What are molecular ion and metastable ion peaks? For a molecule $m_1 = 150$ and $m_2 = 122$, calculate the m/e value of meta stable peak.   (3)

18. (a) With the aid of correlation diagram, explain how a $\prod^4 S + \prod^2 S$ cycloaddition takes place.

Or

  (b) (I) Explain sensitized cis-trans isomerisation by taking oiefin as an example.   (4)

      (II) Draw a correlation diagram for the con-rotatory closure of 1,3-

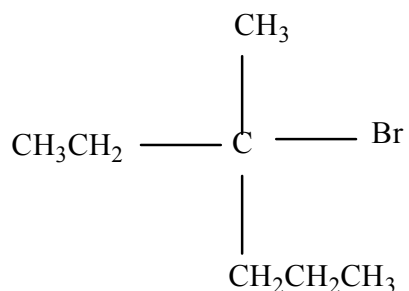butadiene to cyclobutene   (4)

19. (a) Account for the following:

   (I) Allyl chloride, a primary halide undergo nucleophilic substitution via S_N1 pathway.

   (II) Mustard gas undergo hydrolysis very faster than 1-chlorohexane.

   (III) When

$$CH_3CH_2 \underset{\underset{CH_2CH_2CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}} Br$$

   is heated with Base one of the product formed is of maximum yield?

                         Or

   (b) Account for the following:

   (I) In most of the organic reactions following through S_N1 Mechanism, 100% recemisation is not obtained.

   (II) HX elimination occurs in E_2 reaction is stereospecific in nature.

   (III) When ethyl-methyl-n-propyl quarternary ammonium halide is heated with a base one of the product formed is excess.

20. (a) Discuss the structure of Lactose.

                         Or

   (b) (I) By oxidation method, how will determine the size of ring in sugars.   (5)

      (II) Give one method of preparation of pyridazine, pyrazine and pyrimidine.

PHYSICAL CHEMISTRY

Third semester

PART-A

1)Find the point group if centre of symmetry is added to the symmetries of a molecule belonging to C_{4v} molecule

   a)D_{4h} b)C_{6h}

c)D_{6h} d)c_{2h}

2) an example of cyclic group is

a)C_2 b)C_{2v}

C)c_{3v} d)c_{2h}

3) Which of the following have both IR and Raman active modes ?

a)CO_2 b)C_2H_2

C)trans-N_2F_2 d)NH_3

4)The numper ofb vibrational modes for $POCl_3$ molecules is

a)15   b)9

c)6   d)2

5)nuclei possessing electric quadrupole moment , if the spin quntam a is

a)$I=0$ b)$I=1/2$

C)$I<1$ d)$I \leq 0$

6)As "s" electron density decreases generally the isomer shift

a) increases   b) decreases

c)unchanged   d)increases and decreases

a)two triplets   b) triplet and quartet

c)two singlet   d)two singlet ant two triplet

8)which of the following system will show electron spin resonance (ESR) spectrum ?

a) H_2 b)$Na+$

c)Cl^- d)NO_2

9)What happens to the λ_{max} wave length of absorption as the number of conjugation increase ?

a)increase   b)decrease

c)unchanged   d)increase and decrease

10) Absorption of radiation in the UV range attributable to n→$\prod$

Electronic transition is characteristic of which compound?

a)Aromatic hydro compound

b)unsaturated carbonal compounds

c)non-conjugated polyenes

d)conjugated polyenes

PART-B

11) a) Construct C_{3v} point group multiplication table . using multiplication table show that C_{3V} point group is non-abelian

(OR)

b)What is meant by similarity transformation? Using similarity transformation classify the symmetry operation of the point group of water molecule

12)a)using group theory determine whether $\prod \rightarrow \prod$ is allowed in the case of ethelen molecule

(OR)

b)Carry out normal mode analysis of NH_3 molecule using group theory

13) a)how does electric field gradient arise in NQR?

(OR)

b)Write notes on

i)recoil energy

ii)quadrupole splitting

14) a)How many types of orientation takes place when a proton is placed in magnetic field?what are

they?How do the arise? (0R)

b)In a given organic compound two kinds of proton exhibit signals at 50 H_Z and 200 H_Z Using a 60 MH_Z NMR instruments .what would be their equivalent positions using 90 MH_Z spectrometer . Also convert the signals at 50H_Z and 200H_Z into δ and t values?

15)a) What type of transition are observed in α,β -unsaturated carbonyls compound ?how absorption maximum and intensity are shifted when carbonyl group is not conjugated?

(OR)

b)Discuss the principle and theory of if different types of lasers.

PART-C

16) a)state "The great orthogonality theorem" .Discuss the properties and significances of the great orthogonality theorem.

(OR)

b) What are reducible and irreducible representation ?illustrate the properties of reducible and irreducible representation .give example

17) a)Discuss the salient features of HMO.apply the HMO feature on butadiene and determine the delocalization   energy of butadiene.

(OR)

b) How is group theory useful in explain the possible electronic transition in ethylene an butadiene

18) a) i)write the note on inter action of nuclear quadrupole with electric field gradient .

ii)How did you deduce the bonding nature of a molecule from NQR data?

(OR)

b)Discuss the principle and experimental technique of Mossbauer spectra

19) a) (i) How many different types of proton are present in allyl bromide

molecule? label the type of proton

(ii)Aromatic protons are more deshielded than ethylene protons although both the types of protons are attached to sp^2 hybridized carbon atom .explain

(iii) how will you distinguish between inter and intra molecular hydrogen bonding on the basis of PMR spectroscopy .

(or)

b) i) Predict and explain the number of lines in the ESR spectra of the following system ?

i)CH_3CH_2

II)CH_3

III)Mn^{2+}

iv)$C_6H_6^-$
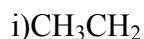
II) What will be the ESR frequency in a magnetic field of 25000 gauss of g=2 and β=9.273×10^{24}JT^{-1}?

20)a) Acetaldehyde [CH_3CHO] is having absorption peak at 160 nm ,180nm,and 292 nm.what type of transition is responsible for each of these absorption?

ii) Write notes on vibronic coupling .

(or)

b)i) Two sets of photo electrons are emitted from N_2 on excitation with He (I) radiation of wavelength 58.4 nm .These have kinetic energies of 5.60 Ev and 4.23 Ev .Respectively. find the ionization energies of these electrons

ii)Explain Q-switching

RESEARCH METHODOLOGY
Third semester

PA RT-A

1)which of the following statements is wrong?

a) review and research article can be published in the same journal

b) Review article will not contain reference section

c) Research article will be sent for peer-reviewing

d) Review article summarises the previously published results

2) Chemicals titles is a

a)weekly publication

b)biweekly publication

c) monthly publication

d) bimonthly publication

3)The subject index of chemical abstracts was divided into subject index and general subject index from

a)1962   b)1972   c)1982   d)1992

4)Chemical abstracts cover the patent details from

a)America only   b)America and European countries only

c)More than 15 countries   d)All the countries

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5. Which of the following statements in wrong?

   (a)Footnotes need not be references.

   (b)Footnotes may be placed at the end of the tables also.

   (c)A footnote marker can be placed in bracket or as superscript.

   (d)All the published articles should carry footnotes other than references.

6. What is meant by plagiarism?

   (a)abusing other scientists in the same field.

   (b)contradicting the other scientists research reports.

   (c)giving cooked up data.

   (d)publishing the already reported idea again.

7. The significant figure for 0.00052 is

   (a)2   (b)4

   (c)5   (d)none of these

8. The common UV spectral range is

   (a)200 nm to 400 nm

   (b)400 nm to 1200 nm

   (c)1800 nm to 4000 nm

   (d)100 nm to 4000 nm

9. The journal of organic chemistry is published by

   (a)Elsevier

   (b)Springer

   (c)American chemical society

   (d)Taylor and Francis

10. Citation details of an author can be obtained from

   (a)Scifinder   (b)Scientific bodies

   (c)Funding agencies   (d)None of these

PART B — (5 x 5= 25 marks)

Answer ALL questions, choosing either (a) or (b)

Each answer should not exceed 250 words.

11. (a) Patent is a form of intellechial property.

   Substantiate this statement.

Or

   (b) Distinguish between text books, journals, monographs and scientific magazines.

12. (a) Explain the uses of formula index in chemical abstracts.

Or

   (b) What is a diceninem index? Explain its significance.

13. (a) Discuss the role of research supervisors during a scientific investigation.

Or

   (b) Write a note on the care to be taken while presenting the data in a thesis.

14. (a) Indicate how a single crystal has to be grown for x-ray analysis.

Or

   (b) Explain the role of nujol and KBr in IR spectral sample preparation.

15. (a) What are the informations available in a journal's homepage on online acess?

Or

   (b) List out the journals published by American chemical society.

PART C — (5 x 8= 40 marks)

Answer ALL questions choosing either (a) or (b).

   Each answer should not exceed 600 words.

16. (a) Give a detailed account of searching the literature for different synthetic methods.

Or

   (b) Write a notes on:

      (i) The need for a proper literature survey during a scientific investigation.

      (ii) Different sources of literature.

17. (a) Give on extensive account of the usage of chemical abstracts.

Or

   (b) Explain in detail how chemical abstracts services as a perfect secondary source of literature.

18. (a) Distinguish between

      (i) end note and foot note and

      (ii) descriptive abstract and information abstract.

Or

(b) Write notes on :

(i) Bibliography

(ii) Research communications.

19. (a) Write notes on :

(i) Accuracy of analysis

(ii) Q-test.

Or

(b) Indicate how the results are to analysed from SEM, FEM, and AFM experiments.

20. (a) Write notes on :

(i) STN International

(ii) Impact factor of a journal.

Or

(b) Explain the role of UGC, CSIR and DST in supporting the academic research in India.