



KO-2134

Seat No. _____

M. Sc. (Part - II) (Sem. III) Examination

November/December – 2017

**CBO-502 : Plant Resource Utilization,
Conservation & Biometry**

(CC) (Old & New Course)

Time : Hours]

[Total Marks : 70

- Instructions :**
- (i) Write answers of section-I and section-II in separate answer books.
 - (ii) There are two sections in this paper both are compulsory and carry equal marks.
 - (iii) Figures in right side indicate marks of sub-questions.
 - (iv) Give your answer with neat and labeled diagrams whenever required.

SECTION - I

- 1** Answer the following : (any two) **14**
- (1) Explain : Origin, evolution, cultivation and use of potato.
 - (2) Write on any two textile fibers.
 - (3) How to detect adulteration in plant products.

- 2 Answer the following : (any three) 14
- (1) Write the uses of dyes. 5
 - (2) Write the importance of firewood. 5
 - (3) Write the chemical composition of rubber. 5
 - (4) Give the family and uses of *Adhatoda vasica*. 4
 - (5) Give the family and uses of *Tectona grandis*. 4
- 3 Answer the following : (any four) 7
- (1) Define : Adulteration. 2
 - (2) Give the scientific name of clove. 2
 - (3) _____ fibers for stuffing. 1
 - (4) Write the uses of rubber. 2
 - (5) Give examples of dyes from flowers. 2
 - (6) Give the botanical name of Arjun Sadar. 1

SECTION - II

- 4 Answer the following : (any two) 14
- (1) Describe : Principles of conservation.
 - (2) Write on Indian initiatives for conservation.
 - (3) Explain : National Parks.
- 5 Answer the following : (any three) 14
- (1) Explain : Normal distribution. 5
 - (2) Describe : Sampling techniques. 5
 - (3) Explain : Student's 't' test. 5
 - (4) Describe : Analysis of variance. 4
 - (5) Describe : Chi-square. 4

6	Answer the following : (any four)	7
(1)	Write the full name of CSIR.	2
(2)	Write the activities of BSI.	2
(3)	Write the full name of DBT.	1
(4)	Define : Probability.	2
(5)	Give the formula of 'F' - test.	2
(6)	Define : Sampling.	1



KT-2161

Seat No. _____

M. Sc. (Part - II) (Sem. III) Examination

November / December - 2017

Botany : EBO-502

(Air Pollution & Climate Charge)

Time : 2 Hours]

[Total Marks : 50

- Instructions :**
- (1) The question paper consist of two section, each has two questions.
 - (2) All questions are compulsory.
 - (3) Write answer of each section in separate answer sheet.
 - (4) Illustrate your answers with necessary diagram, if required.

SECTION - I

1 Answer the following :

(a) Describe any two out of three : Long answer 10 question.

- (1) Formation of nitrogen derivatives.
- (2) Pollution effect on ecosystem.
- (3) Effects of fluoride on human health.

(b) Explain any two out of four : Medium Answer question. 6

- (1) Effects of sulphur on ecosystem.
- (2) Nitrogen metabolism (out line).
- (3) Green house gases.
- (4) Sulphur cycling.

- (c) Mention any two out of four : Short answer 4
question.
- (1) Write in short: emission.
 - (2) Role of decomposers.
 - (3) Effects of Nitrogen on plants.
 - (4) Outline of cycling of Fluoride.
- 2 Answer the following : five out of seven : 5
- (1) The major constituent in the air is _____.
 - (2) Write the chemical composition of the atmosphere.
 - (3) Define: pollution.
 - (4) What do you mean by bioaccumulation?
 - (5) What is deposition?
 - (6) Write any two names of denitrification bacteria.
 - (7) What is toxicity?

SECTION - II

- 3 Answer the following :
- (a) Describe any two out of three: Long answer 10
question.
- (1) Describe in short: ozone depletion.
 - (2) Write in short: photochemical smog.
 - (3) Global warming.
- (b) Explain any two out of four: Medium 6
Answer question.
- (1) Write note on: acid rain.
 - (2) Natural vegetation.
 - (3) Mechanism of toxicity.
 - (4) Sea level rise.

(c) Mention any two out of four : Short answer 4 question.

(1) State any two increasing effects of CO_2 on plants.

(2) Mention the stratospheric zone.

(3) Effects of acid rain on soil fertility.

(4) What is forest declination ?

4 Answer the following : five out of seven : 5

(1) Green house effects is due to increase in _____.

(2) What is a biological action spectrum?

(3) Agricultural oceanic influence.

(4) What is albedo effect?

(5) Mention the full form of UV-B.

(6) State any two oxidants effects human health.

(7) Harmful ultraviolet radiations are absorbed by _____.



KS-2146

Seat No. _____

M. Sc. (Sem. III) (Paer - II) Examination

November / December - 2017

CBO-503 : Botany

(Molecular Biology & Biotechnology)

Time : 3 Hours]

[Total Marks : 70

- Instructions :**
- (1) The question paper consists of two section, each has two question.
 - (2) All questions are compulsory. In each section first two questions carry 14 marks and Last questions carry 7 marks.
 - (3) There is no overall choice. However, an internal choice has been provided in each question.
 - (4) Write answer of each section in separate answer sheet.
 - (5) Illustrate your answers with necessary diagrams, if required.

SECTION - I

1 Answer the following questions (two out of three) 14 each of 7 marks :

- (1) Explain the enzymes involved in DNA replication.
- (2) Describe the transcription in prokaryotes.
- (3) Explain: wobble hypothesis.

- 2 Answer the following questions : (three out of five) 14
each of 5, 5 and 4 marks :
- (1) Describe the fine structure of gene.
 - (2) Write a short note on: allelomorphism.
 - (3) Discuss on: human genome project.
 - (4) Explain the cancer as the end product of multistep process.

- 3 Answer the following questions (four out of six) 7
each 2, 2, 2 and 01 marks.
- (1) What do you mean by initiation codon? 2
 - (2) Explain the term: mutation. 2
 - (3) State any one difference between B-DNA and Z-DNA. 1
 - (4) What do you mean by Cistron ? 2
 - (5) Explain the term: oncogenes. 2
 - (6) Mention the full form of MPF. 1

SECTION - II

- 4 Answer the following questions (two out of three) 14
each of 07 marks.
- (1) Describe: genome library.
 - (2) Write a short note on: DNA fingerprinting.
 - (3) Mention the technique of gene cloning.
- 5 Answer the following questions (three out of five) 14
each of 05, 05 and 04 marks
- (1) Write a short note on: clonal propagation.
 - (2) Describe: transgenic plants.

- (3) Explain: artificial seeds.
- (4) Write a short note on: germ plasm storage.
- (5) Discuss in brief pollen culture.
- 6 Answer the following questions : (four out of six) 7
each 02, 02, 02 and 1 marks.
- (1) Mention any two names of vectors used in biotechnology. 2
- (2) State any two uses of polymerase chain reaction(PCR). 2
- (3) What do You mean by DNA sequencing? 1
- (4) Explain the word: partical gun. 2
- (5) Discuss in very short: secondary metabolites. 2
- (6) Define : cryopreservation. 1
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KO-2131-32-33 Seat No. _____

M. Sc. (Sem. III) Examination

November / December - 2017

1. CHN-602(O) : Organic Chemistry : Paper - II
2. CHN-602(I) : Inorganic Chemistry : Paper - II
3. CHN-602(P) : Physical Chemistry : Paper - II

Time : 3 Hours]

[Total Marks : 70

1. CHN-602(O) : Organic Chemistry : Paper - II

Instruction : All questions carry equal marks.

- 1 Answer any two : 14
- (i) Explain about batch Vs continuous Process with suitable examples.
 - (ii) Write differences between unit process and unit operation. Discuss importance of hydroxylation with suitable examples.
 - (iii) Write short note on Design of Flowchart of Plant.
 - (iv) Discuss the industrial importance of sulphonation.
- 2 Answer any two : 14
- (i) Define : Detergent. Write classification of detergents with appropriate examples.
 - (ii) Define : Preservative. Write short note on various types of food preservatives.
 - (iii) Discuss general method for isolation of essential oils.
 - (iv) Write short note on animal fixatives and fruit concentrates.

- 3 Answer any **three** : 14
- (i) Discuss in detail about fungicides and rodenticides.
 - (ii) Write short note on chlorine containing insecticides.
 - (iii) Explain Hydrogenation of vegetable oil with it's importance.
 - (iv) Discuss about plant nutrients and Plant hormones.
 - (v) Write brief account on Cotton seed oil.

- 4 Answer any **three** : 14
- (i) What is Pulp? Write a note on sulphite pulp.
 - (ii) Discuss manufacture of Viscose rayon.
 - (iii) Write short summary of manufacture of cane sugar.
 - (iv) Give synthesis of Diazepam and Cimetidine.
 - (v) Write synthesis of Phenobarbital and Piperazine citrate.

- 5 Answer any **seven** : 14
- (i) Define : Weedicides and write two examples
 - (ii) Write a meaning of Patent
 - (iii) Which reagents are useful for amination reaction?
 - (iv) Draw a structural formula of Vanilla
 - (v) Write information of hydrophobic and hydrophilic portions of the surface active agents
 - (vi) Write four examples of Vegetable Oil
 - (vii) Write any four name of bleaching agents for brightness of paper
 - (viii) What is Celotex?
 - (ix) Write classification of herbicides
 - (x) Define: Calendaring.

2. CHN-602(1) : Inorganic Chemistry : Paper - II

- Instructions : (1) All questions carry equal marks.
(2) Draw labelled diagram wherever necessary.

1 (a) Answer any **two** of the following questions: 14

- (1) Describe 'Siderophores' and 'Ferritin'....
- (2) Explain the structure and mechanism of Iron-Sulfur protein.
- (3) Write a note on natural oxygen carrier.

(b) Answer any **one** of the following questions :

- (1) Write a note on Cytochromes-C.
- (2) Explain the physiology of Myoglobin.

2 (a) Answer any **two** of the following questions : 14

- (1) Discuss the biochemistry of Vanadium.
- (2) Discuss the Function of Cobalt in biological System.
- (3) Write a note on 'Metallo Porphirin'.

(b) Answer any one of the following questions :

- (1) Write a note on importance of Chromium in biological system.
- (2) Describe biochemistry of Vanadium.

- 3 (a) Answer any **two** of the following questions : 14
- (1) Discuss "migratory insertion" reaction.
 - (2) Discuss "Reductive Elimination Reactions"
 - (3) Discuss the use of Catalyst in 'Hydroformylation'.

- (b) Answer any **one** of the following questions :
- (1) Write a note on use of OMC in Carboxylation and Polymerization
 - (2) Describe the use of organometallic compounds in Hydrogenation.

- 4 (a) Answer any **two** of the following questions : 14
- (1) Discuss properties and compounds of Neptunium
 - (2) Discuss the electronic configurations of trans uranic elements
 - (3) Describe the methods of extraction of transuranic elements.

- (b) Answer any **one** of the following questions :
- (1) Explain fluorescence spectrum of transuranic elements.
 - (2) Discuss Chemistry of oxidation state (IV) for Ce, Pr and Tb.

5 Answer any Seven of the following questions: 14

- (a) Define Bioinorganic chemistry.
- (b) Give example of organometallic compound of Actinides.
- (c) The word "Yellow Cake "describe which compound of uranium?
- (d) What is Sandwich structure?
- (e) Give an example of 12electron organometallic compound.
- (f) Give the use of Silicon Oil.
- (g) Give the definition of "Lanthanide Contraction".
- (h) The colour of Pu^{3+} and Cm^{4+} ions are?
- (i) Write two examples of alkyls of Actinides.
- (j) Water-gas shift reaction is used for _____ ?

3. CHN-602(P) : Physical Chemistry : Paper - II

- Instructions :
- (i) All question are compulsory.
 - (ii) Figures to the right indicate maximum marks.
 - (iii) Answer the question accurately and appropriately constants :

Constants :

$$h = 6.627 \times 10^{-27} \text{ erg} \cdot \text{sec}$$

$$R = 1.987 \text{ cal mol}^{-1} \cdot \text{deg}^{-1}$$

$$K = 1.38 \times 10^{-16} \text{ erg} \cdot \text{mol}^{-1} \cdot \text{deg}^{-1}$$

$$N = 6.02 \times 10^{23} \text{ per mol.}$$

- 1 (a) Attempt any two the following : 10
- (a) Derive DHO theory.
 - (b) What is transference number ? Describe an experimental method for determination of ionic mobility.
 - (c) Elaborate Debye-falkenhagen effect and wein effect with illustrations.
- (b) Solve any one problem : 4
- (a) A 0.2N solution of NaCl was found to have specific conductance of $1.75 \times 10^{-2} \text{ ohm}^{-1} \cdot \text{cm}^{-1}$ at 18°C . the transference number of cation in this solution is 0.385 calculate the equivalent conductance of sodium and chloride ions.

(b) The equivalent conductance at 18° C of a normal solution of KCl is 98.2 mho cm² / equivalent and for infinite dilution at the same temperature 131 mho.cm² / equivalent calculate the degree of dissociation of KCl at this dilution.

2 Answer any two of the following questions : 14

- (a) Discuss colorimetric methods to determine dissociation constant of Monobasic acids.
- (b) Give brief explain of the "Ampholytes".
- (c) What is self-ionization of water. Explain the determination of ionic product of water by conductometric method.

3 Answer any two of the following questions : 14

- (a) Explain hydrogen over voltage on the basis of bubble formation concept.
- (b) Explain : Electrolytic and decomposition voltage.
- (c) The standard reduction potential E° of zinc is - 0.762V and its hydrogen over voltage is 0.746V calculate the maximum permissible final activity of a solution of zinc ions. If the concentration of zinc is to be reduced to 1.0×10^{-8} gm.ion/litre by electrodeposition without the evolution of hydrogen at the cathode.

- 4 Answer any two of the following questions : 14
- (a) Explain "Influence of zeta potential of ions on electro kinetic phenomena.
 - (b) Derive an equation for streaming potential. Explain the effect of positive ions on zeta-potential with illustration.
 - (c) Explain : Tunneling condition and proton transfer curve.
- 5 Attempt any seven of the following : 14
- (a) Explain : Dipolar ions.
 - (b) Which cation has the greatest ionic mobility in water ? Why ?
 - (c) Compare the zeta potential with streaming potential.
 - (d) Discuss "Oxygen over voltage".
 - (e) Explain : Oxidation of fatty acids.
 - (f) Discuss the polarisation.
 - (g) What is the driving force in "Electro-osmosis".
 - (h) Acid-base is relative property-Justify the statement with examples.
 - (i) What is concentration polarization ? How it can be minimized ?
 - (j) Explain : "Electrophoresis".



KQ-2141-42-43 Seat No. _____

M. Sc. (Sem. III) Examination

November / December - 2017

1. *CHN-603-(O) : Organic Chemistry*
2. *CHN-603 : Inorganic Chemistry (Corrosion)*
3. *CHN-603(I) : Inorganic Chemistry - III
(Coordination Chemistry)*

Time : 3 Hours]

[Marks : 70

1. *CHN-603-(O) : Organic Chemistry*

Instruction : All questions are compulsory and carry equal marks.

- 1 Answer any **two** of the following : 14
- (i) Define a drug according to WHO. Give the requirements for ideal drugs. Discuss the Classification of drugs on the basis of their therapeutic actions.
 - (ii) Write short note on
 - (1) Diagnostic agents
 - (2) Drug design through conjugation
 - (iii) Explain the relationship between chemical constitution and physiological activity. How are I.T. useful for this study ?
 - (iv) Explain the use of modern instrumental methods based upon chromatographic techniques in pharmaceutical chemistry.

2 Answer any **two** of the following :

14

- (i) Explain the constitution of penicillin by the use of infrared spectra. Give synthesis of penicillin from penicillamine.
- (ii) What is the general structure of tetracyclin? Synthesize any two tetracyclin antibiotics.
- (iii) Discuss the structure of N-methyl L-glucoseamine in streptomycin.
- (iv) Discuss the production, isolation, properties, uses and mechanism of action of
 - (i) Actinomycine
 - (ii) polyenes

3 Answer any **two** of the following :

14

- (i) Give synthesis and uses of sulfathiadiazole and sulfaguanidine.
- (ii) Define and classify sulphonamides. How will you synthesize and explain use of sulphaacetamide ?
- (iii) Write synthesis of sulpha drugs and explain mechanism :
 - (i) Sulphanylamide
 - (ii) Trimethoprim

4 Answer any **two** of the following :

14

- (i) What are anticholinergic drugs ? Classify them. Give synthesis any two antispasmodic drugs.

- (ii) Mention any three physiological responses of histamine. Write synthesis and uses of benadryl.
- (iii) Differentiate between general and local anaesthetics. Explain the ideal anaesthetic with reference to ester and amide groups.
- (iv) What is cholinergic nervous system ? Give synthesis and uses of neostigmine.

5 Answer any seven of the following :

14

- (i) What is the full form of CADD and QSAR.
- (ii) Give synthesis of sulphalene.
- (iii) Define: Emulsifying agents.
- (iv) What are antibiotic drugs ?
- (v) Give uses of penicillin.
- (vi) What is blocking agent ?
- (vii) Give synthesis of any one sulpha drug.
- (viii) What is Local anaesthetics ? What is its action ?
- (ix) Distinguish between "drug" and "medicine".
- (x) What is antihistamine ? What is its role in human body ?

2. CHN-603 : Inorganic Chemistry (Corrosion)

1 Answer any two : 14

- (a) Discuss the factors that encourage the intergranular corrosion and write the step to decrease this corrosion.
- (b) What is pourbix diagrams ? Explain their utility and limitations.
- (c) Write short note on Differential aerration current.

2 Answer any two : 14

- (a) Discuss the application of passivators.
- (b) What is Polarized Cell ? Discuss the influence of polarization on the corrosion rate in the acidic solution with example.
- (c) Discuss the corrosion of Nickel in atmosphere.

3 Answer any two : 14

- (a) Explain Wagner theory of oxidation.
- (b) Write short note on Underground corrosion and its prevention.
- (c) Write short note on "Corrosion Fatigue".

Answer any **two** :

14

- (a) Write a short note on Hydrogen Cracking
- (b) Discuss the factor affecting on the corrosion of Iron and Steel.
- (c) Write short note on "Paints".

Answer any **two** :

14

- (a) Explain the Sheradizing Process.
- (b) Write a short note on "Uniform attack"
- (c) Discuss the classification of coating for corrosion resistance.

3. CHN-603(I) : Inorganic Chemistry - III
(Coordination Chemistry)

1 Answer any two questions from the following : 14

(a) For $m = m'$, prove that integral $= \frac{3}{4} r^4 \sin^4 \theta$.

(b) Evaluate the integral $\int_0^\pi \theta_2^1 \theta_4^0 \theta_2^1 \sin \theta d\theta$.

Given :

$$\theta_2^1 = \sqrt{\frac{15}{4}} \sin \theta \cos \theta, \theta_4^0 = \sqrt{\frac{9}{128}} (35 \cos^4 \theta - 30 \cos^2 \theta + 3)$$

(c) Starting from the Secular determinant, prove that the values of energy for e_g and t_{2g} are $+6 Dq$ and $-4 Dq$ respectively.

2 Answer any two questions from the following : 14

(a) Derive the equation $\chi(\alpha) = \frac{\sin\left(l + \frac{1}{2}\right)\alpha}{\sin\frac{\alpha}{2}}$ and

find out the value of $\chi(C_2)$ and $\chi(C_3)$.

(b) Prove that $\langle \pm 3 | V_0 | \pm 3 \rangle = -3 Dq$.

(c) Find out the commutator value of $[L_+, L_-]$.

3 Answer any **two** questions from the following : 14

(a) For $E = 2 Dq$, prove that

$$\psi_3 = \sqrt{\frac{1}{24}} [3 \langle 3 \rangle + \sqrt{5} \langle -1 \rangle].$$

(b) Find out the value of $\langle 0 \rangle |V_0| \langle 0 \rangle$.

(c) Prove that $\langle 3, -2 \rangle = \Phi_{-2} \Phi_0$.

4 Answer any **two** questions from the following : 14

(a) Discuss vibronic coupling spectra for iron complexes.

(b) Discuss vibronic coupling spectra for VO(IV) complexes.

(c) Discuss the selection rule.

5 Answer any **seven** questions from the following : 14

(1) What is the Legendre Polynomial value of $P_l(\cos \theta)$?

(2) What are the values of l and n for 3d- orbital ?

(3) How inter electronic repulsion term is written in the mathematical way ?

(4) Write the values of ladder operators ?

- (5) What is the value of dv in polar coordinates ?
 - (6) Which factors affect the stability of metal complexes ?
 - (7) Define vibronic coupling.
 - (8) Which type of separation of d-orbitals will be there in strong and weak field ?
 - (9) Explain the term A_{2g} in terms of Mulliken symbol.
 - (10) Define RS coupling.
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KS-2154-55-56-57-58-59 Seat No. _____

M. Sc. (Sem. III) Examination

November / December – 2017

Chemistry : CHN-604 (B), (D), (RM), (A), (C) & (E)

- 1. CHN-604 (B) : Photoinorganic Chemistry*
- 2. CHN-604 (D) : Environmental Chemistry*
- 3. CHN-604 (RM) : Research Methodology*
- 4. CHN-604 (A) : Organic Chemistry
(Organic Photochemistry) (New Course)*
- 5. CHN-604 (C) : Biophysical Chemistry*
- 6. CHN-604 (E) : Bioorganic Chemistry (Core Elective Course)*

Time : 2 Hours]

[Total Marks : 50

1. CHN-604 (B) : Photoinorganic Chemistry

- 1 Answer any three : 20
- (1) Explain the principle of Lambert-Beer law of photochemistry.
 - (2) Explain the biomolecular quenching.
 - (3) Explain the Charge-transfer spectra with proper illustration.
 - (4) Derive the equation for redox potential of the excited states.
 - (5) Write a note : Photosubstitution and Photo-oxidation reaction.

2 Answer any three :

20

- (1) Discuss the metal complexes of 1, 10-phenanthroline complexes.
- (2) Describe : Metal complex sensitizer.
- (3) Describe the Franck-Condon principle for photochemical process.
- (4) Write a note on water photolysis.
- (5) Discuss the flash photolysis and its stopped flow technique.

3 Answer any five :

10

- (1) What is photochemical reaction ?
- (2) What is quantum yield ?
- (3) Define : Spontaneous emission.
- (4) What is Redox-potential ?
- (5) Give two examples of semiconductor.
- (6) What is dipole moment ?
- (7) What is quenching ?

2. CHN-604 (D) : Environmental Chemistry

Instruction :

All questions are compulsory and carry equal marks.

- 1 a. Compare and contrast between early and current atmosphere of the Earth. 10
- b. Write the significance of biogeochemical cycle and explain the path of nitrogen in the environment.

OR

- 1 What is environment? Explain various component of natural environment adding their significance. 10
- 2 Define water pollution giving its types and elaborate a note on quality parameters and standards for drinking water. 10

OR

- 2 a. Explain the analytical methods to test the potability of water. 10
- b. Describe the effects of fertilizers on the soil quality.
- 3 a. Explain the method for determining air quality. 10
- b. What is LA Smog ? Explain its formation and impacts.

OR

- 3 a. Write a note on Green house effect. 10
b. Explain the formation and deposition of acid rain.

- 4 Explain the principal emissions from the fertilizer industry and their fates in the environment. 10

OR

- 4 a. Write a note on different kinds of wastes generated through industry. 10
b. Describe the impacts of power plants on the ambient environment.

- 5 Write short notes on any two : 10
1. Role of chemistry in abating environment pollution
 2. Soil micro nutrients
 3. Effects of Halide gases on environment
 4. Significance of dissolve oxygen in water.

3. CHN-604 (RM) : Research Methodology

Instruction : Attempt all the questions.

1 Write the answer of any three : **20**

- (i) Give the definition of research. Explain its significance in modern time.
- (ii) Give the research process by flow-chart.
- (iii) Give the difference between quantitative and qualitative research.
- (iv) Discuss briefly about basic features of a good research design ?
- (v) Give your views in details about applied and fundamental research.

2 Write the answer of any three : **20**

- (i) Give a brief note on the problems face in our India for research.
- (ii) Give your best views to prepare best thesis.
- (iii) What is the importance of extensive literature review in research ?
- (iv) Write a note on research hypothesis.
- (v) Give a note on the comparison of research activities of State universities with Central universities.

3 Write the answer of any ten :

10

- (i) What a difference between formal and informal experimental research designs ?
- (ii) Give two important concepts related to research design ?
- (iii) What is an impact factor ?
- (iv) What is the meaning of ISSN and ISBN ?
- (v) What do you meaning of data collection in research work ?
- (vi) Write the full name of DST and CSIR.
- (vii) What is variable ?
- (viii) What is INFLIBNET ?
- (ix) What is the full name of ISSN and ISBN ?
- (x) Give the full name of ICC and ICS.
- (xi) Volatile compounds are analysed using G.C., what compounds are analyse by using HPLC ?
- (xii) What column is used in reverse phase HPLC ?

4. CHN-604 (A) : Organic Chemistry
(Organic Photochemistry) (New Course)

1 Answer any three : **20**

- (1) What is isomerism ? Discuss geometrical isomerism.
- (2) Give an account on photochemical reaction.
- (3) Write a note on Actinometry.
- (4) Explain the photochemistry of cyclic and a cyclic carbonyl compounds.
- (5) Discuss the determination of rate constant of reactions.

2 Answer any three : **20**

- (1) Explain the substitution reaction of aromatic compounds.
- (2) Explain photo-fries rearrangement.
- (3) Discuss the photochemical formation of smog.
- (4) Describe the rearrangement of 1, 4 - Dienes.
- (5) Write a note on photochemistry of vision.

3 Answer in short :

10

(1) What is photochemistry ?

(2) Define Smog.

• (3) What is singlet oxygen ?

✓ (4) What is photolysis ?

(5) Define electromagnetic radiation.

✓ • (6) What is rate constant ?

(7) What is quantum yield ?

• (8) What is phosphorescence ?

(9) What is semiconductor ?

(10) What is intramolecular reaction ?

5. CHN-604 (C) : Biophysical Chemistry

- 1 (A) Give the answer any **two** : 10
- (1) Explain : Membrane potential.
 - (2) Explain : Double helix structure of DNA.
 - (3) Explain : Sedimentation velocity.
- (B) Give the answer any **two** : 6
- (1) Give the properties, mechanism and application of Enzymes.
 - (2) Explain : Nucleotide and nucleoside.
 - (3) Explain : Nerve conduction.
- (C) Give the answer any **one** : 4
- (1) What is the pH of a 0.025 M aqueous solution of CH_3COOH at $25^\circ C$?
($p^{ka} = 4.50$)
 - (2) The intrinsic viscosity of a biopolymer solution at $25^\circ C$ is 1.9 dl/gm. The Mark-Houwink constants are 3.7×10^{-4} and $a = 0.6$. Calculate the molecular weight of biopolymer.
- 2 (A) Give the answer any **two** : 10
- (1) Give the difference between Globular and Fibrous proteins.
 - (2) Explain the structures of proteins.
 - (3) Explain : Synthesis of ATP from ADP.

(B) Give the answer any two :

6

- (1) Calculate the isoionic points of Aspartic acid [(p^{ka})₁ = 1.99, (p^{ka})₂ = 3.90, (p^{ka})₃ = 9.90]
- (2) Explain : Electrophoresis.
- (3) Explain : Most probable end to end dimension.

(C) Give the answer any one :

4

- (1) Explain : Determine the molecular weight of Biopolymers by viscosity method.
- (2) Explain : Donnan membrane equilibrium in tanning of leather.

3 Give the answer in short :

10

- (1) What is Iso-electric point ?
- (2) What is BIO-POLYMER ?
- (3) Give the zwitter ion structure of Amino acid.
- (4) Write a difference between exergonic and endergonic.
- (5) Write a full form : RNA.
- (6) What is Enzymer ?
- (7) Write a difference between catabolism and Anabolism.
- (8) Write a difference between micro and macro molecules.
- (9) Give the structure of Gly-Phe-Ala.
- (10) Give the types of Amino acid.

6. CHN-604 (E) : Bioorganic Chemistry (Core Elective Course)

1 Answer any three : 20

- (a) Give an account on catalysis by approximation.
- (b) Write a note on Michaelis-Mention model. How can you determine initial velocity of a reaction ? What is its significance ?
- (c) What is enzyme therapy ? Give at least two examples.
- (d) Distinguish between α -chymotripsin and π -chymotrypsin. Discuss the mode of action and specificity of chymotrypsin.

2 Answer any three : 20

- (a) Name any five enzymes for fatty acid synthesis. Explain in detail the different pathways of enzyme catalyzed carboxylation and decarboxylation.
- (b) Give an account on water soluble vitamins that function as coenzymes.
- (c) Discuss the role of lipoic acid and TPP in pyruvate dehydrogenase reaction.
- (d) Give an account on synzymes.
- (e) Illustrate specificity of cognate DNA molecules.

3 Answer any five in brief :

10

- (a) What are protease inhibitors ? Give one example of biological effect of them.
 - (b) Explain host-guest chemistry as enzyme model.
 - (c) What is polymerase chain reaction ?
 - (d) Explain Recombinant DNA technology in brief.
 - (e) Give any two functions of NMPkinase.
 - (f) Explain the meaning of molecular adaption.
 - (g) Draw and explain chair and boat forms of β -D-glucopyranose.
 - (h) Are animals capable of converting fatty acids into glucose ? What is the result of entry of two carbon atoms of acetyl group of Acetyl Co-A in the citric acid cycle ?
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