ACA-3851

Seat No._____

M. Sc. (Sem. II) Examination

March/April – 2019

CHN-501 : Chemistry : Paper - VII

(Inorganic Chemistry)

Time : 3 Hours] [Total Marks : 70

1 (a) Answer any two : 8

(1) What is term symbol ? Give the Hund's rule for the determination of ground state term.

(2) Explain the electronic spectra of $\left[V(H_2O)_6\right]^{3+}$ ion.

(3) Derive the calculation of 10 D_q, B and β parameters by appropriate example.

(b) Answer any one : 6

(1) Explain the polymeric nature of M-C bond in metal carbonyls on the basis of V.B.T. and M.O.T.

(2) What is orgel-diagram ? Explain the orgel-diagram for $d^4 - d^6$.

2 (a) Answer any two : 8

(1) Write a note on : "Metal carbonyl clusters".

(2) What is mono nuclear metal carbonyl ? Explain the structure of $Cr(CO)_6$ using IR spectra.

(3) Give shoprt account on importance of nitrosyl compounds.

(b) Answer any one : 6

(1) Discuss the structure of Iron penta carbonyl $[Fe(CO)_5]$.

(2) Calculate E.A.N. :

$Mn_2(CO)_{10}$, $Ni(CO)_4$, $Fe_3(CO)_{12}$.

3 (a) Answer any two : 8

(1) Explain the Wed's rule for "Boron-cages".

(2) What are carboranes ? Give report on "Metallo-carboranes".

(3) Explain the structure of B_2H_6 on the basis of sp^3 hybridization.

(b) Answer any one : 6

(1) Explain the structure of higher boranes like :

B_5H_{11}, $B_{10}H_{14}$, B_6H_{10}

(2) What are boranes ? Give their nomenclature classification and various types of bonds present in higher boranes.

4 (a) Answer any two : 8

(1) Explain the "Keggin's theory".

(2) Brief report on O.M.C. of Al and Mg.

(3) Classify the organo-metallic compounds.

(b) Answer any one : 6

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(2) Calculate E.A.N. :

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(3) Classify the organo-metallic compounds.

(b) Answer any one : 6

(1) Explain the structure of Tetramethyl lithim.

(2) Write short note on : "Heteropoly blues".

5 Answer any seven : 14

(1) What is O.M.C. ?

(2) Give the limitations of orgel diagram.

(3) Give the structure Zeise salt.

(4) Draw the structure of two inter convertible froms of "Ferrocene".

(5) Define the $\Delta s = 0$ term for electronic transition.

(6) How many micro states arise from d^3 case ?

(7) Derive the ground state term for Fe^{++} ion.

(8) What is E.A.N. ?

(9) Which of the following terms represents the ground state term ? Why ?

^1G ^1D ^1S ^3P ^3F.

(10) Find the value of L, S, J and No. of unpained electrons for 5I term symbol.

ACA-3852

Seat No._____

M. Sc. (Part. I) (Sem. II) Examination

March / April – 2019

CBO - 404 : Botany

(Angiosperm Taxonomy and Plant Reproduction)

Time : 3 Hours] [Total Marks : 70

Instructions :

(1) The question paper consists of two sections, each has two questions.

(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 each question

(4) Write answers of each section in separate answer sheet.

(5) Illustrate your answers with necessary diagrams, if required.

SECTION - I

1 Answer the following : (**two** out of three) 14
each of 07 marks :

(1) Describe the morphological characters of plants as taxonomical evidences.

(2) Write details: herbarium and floras as taxonomic tools.

(3) Describe: Hutchinson's phylogenetic systems of angiosperm classification.

2 Answer the following : (**three** out of five) 14

each of 05, 05 and 04 marks.

(1) Give the floral diagram and floral formula of Capparaceae and Sterculiaceae families.

(2) Give the distinguishing characters of family Euphorbiaceae.

(3) Describe the economic importance of family Oleaceae and Rutaceae.

(4) Compare the floral characters of family Cyperaceae and Poaceae.

(5) Give the distinguishing characters of Capparaceae.

3 Answer the following : (**four** out of six) 7

each 02, 02, 02 and 01 marks.

(1) What is binomial nomenclature? 2

(2) Give the merits of GIS. 2

(3) Who gave the Lignosae and Herbaceae division. 1

(4) Give the scientific name of any two plant species of family Convolvulaceae. 2

(5) Give the floral diagram and floral formula of Menispermaceae. 2

(6) Gynobasic style is characteristic of which family? 1

SECTION - II

4 Answer the following : (**two** out of three) 14
each of 07 marks.

(1) Describe in short: formation of vegetative and generative cells..

(2) Write note on: scope of Palynology.

(3) Describe: Types of ovules.

Answer the following : (**three** out of five) 14
each of 05, 05 and 04 marks.

(1) Describe in short: crucifer type of embryo development.

(2) Write note on: nutrition of embryo sac.

(3) Write short note : entry of pollen tube in to the ovule.

(4) Write short note: polyembryony.

(5) Describe: The cellular type of endosperm development.

6 Answer the following : (**four** out of six) 7
each 02, 02, 02 and 01 marks.

(1) Write the function of tapetum. 2

(2) Define: microsporogenesis. 2

(3) Exine of pollen grain is made up from _____. 1

(4) Define: double fertilization. 2

(5) Write the role of Boron in in vitro pollen germination. 2

(6) After fertilization the seed coat develops from _____. 1

ACA-3863 Seat No._____

M. Sc. (Sem. II) Examination

March / April – 2019

CBO-405 : Plant Anatomy & Ecology : CC

(Old & New Course)

Time : **3** Hours] [Total Marks : **70**

Instructions : (i) The question paper consists of two section, each has three question. Write answer of each section in separate sheet.

(ii) All questions are compulsory.

(iii) Illustrate your answer with necessary diagrams if required.

SECTION - I

1 Answer the following : (any two) **14**

(1) Explain Histogenic layer theory.

(2) Describe Korper-Kappe theory.

(3) Describe ontogeny of secondary vascular tissues.

2 Answer the following : (any three) **14**

(1) Describe Cambium in monocotyledons. **5**

(2) Explain the Anomalous secondary growth in Mirabilis stem. **5**

(3) Explain the structural variability in Typha leaves and Nymphaea leaves. 5

(4) Write note on : Flower anatomy. 4

(5) Describe the role of Cambium in Wound healing. 4

3 Answer the following : (any four) 7

(1) Write the function of Cambium. 2

(2) Define : Complex tissues. 2

(3) Define : Growth rings. 1

(4) Define : Anomalous secondary growth. 2

(5) Write in short : Wood anatomy. 2

(6) What is grafting ? 1

SECTION - II

4 Answer the following : (any two) 14

(1) Describe the Phytosociological characters of plant Community-Synthetic characters.

(2) Describe the structure of Ecosystem.

(3) Explain : Sustainable development.

5 Answer the following : (any three) 14

(1) Describe the aquatic biomes. 5

(2) Describe the Bioremediation. 5

(3) Explain the Biosphere Reserve Conservation. 5

(4) Write on Bio-geographical zones of India. 4

(5) Write on Phytoremediation. 4

6 Answer the following : (any four) 7

(1) Define : Plant community. 2

(2) Define : Ecosystem. 2

(3) Which are the non-conventional energy sources ? 1

(4) Give the names of the national parks in Gujarat. 2

(5) Define : Conservation. 2

(6) Write any one importance of forest conservation. 1

ACA-3873 Seat No._____

M. Sc. (Sem. II) Examination

March / April – 2019

CBO - 406 : Botany

(Biophysics, Instrumentation and Biochemistry)

Time : 3 Hours] [Total Marks : 70

Instructions : (1) There are two sections in this question paper.
(2) Each section contains three questions and carries 35 marks.
(3) Write answers of each section in separate answer book.
(4) Figures to the right indicate marks of questions.

SECTION - I

1 Describe any **two** in detail : **14**
(1) Laws of Thermodynamics.
(2) What are Isotopes? Mention their use in Plant sciences.
(3) Buffers and their role in bio-chemical processes.

2 Discuss any **three** in short : **14**
(1) Principle and applications of Electrophoresis. **5**
(2) Principle and types of Paper Chromatography. **5**
(3) Principle and applications of Centrifugation. **5**

(4) Ion exchange chromatography: Principle, types of resins and applications. 4

(5) Principle and applications of Light microscopy. 4

3 Explain any **four** in brief : 7

(1) Free radicals with suitable example. 2

(2) Write: Principle of Colorimetry. 2

(3) Applications of ultracentrifugation. 2

(4) Uses of types of radiations in Plant Sciences. 2

(5) Define : pH. 1

(6) An instrument used to measure optical density of coloured solution. 1

SECTION - II

4 Describe any **two** in detail : 14

(1) Give properties of Disaccharides and Polysaccharides and write structural formula of Maltose, Sucrose, Starch and Cellulose.

(2) Explain with suitable examples: Covalent and Ionic chemical bonds.

(3) Functions and symptoms of deficiency diseases of Fat-soluble Vitamins.

5 Discuss any **three** in short : 14

(1) Biological significance of Carbohydrates and Lipids 5

(2) Polyunsaturated Fatty acids 5

(3) Classification of Enzymes with suitable examples 5

(4) Distinguish between different RNAs 4

(5) Define : Enzymes and write their properties 4

6 Explain any **four** in brief : **7**

(1) Coenzymes and co-factors **2**

(2) Give names of - OH group containing amino acids and aromatic amino acids **2**

(3) Formation of Dipeptide molecule **2**

(4) Functional group isomerism with examples **2**

(5) Define : Hydrogen bond **1**

(6) Distinguish between: Purine and Pyrimidine **1**

ACD-3883-3884-3900 Seat No._____

M. Sc. (Sem. II) Examination

March / April - 2019

Botany (Elective)

(1) EBO - 404 : Phyto Chemistry & Pharmacology of Herbal Drugs (New Course)

(2) EBO - 405 : Plant Tissue Culture

(3) EBO - 406 : Marine Botany

(Old & New Course)

Time : 2 Hours] [Total Marks : 50

(1) EBO - 404 : Phyto Chemistry & Pharmacology of Herbal Drugs (New Course)

Instructions :

(1) There are two sections in this question paper.

(2) Each section contain two questions and carries 25 marks.

(3) Write answer of each section in separate answer book.

SECTION - I

1 (a) Describe any two in detail : 10

(1) Terpenes.

(2) Polysaccharides.

(3) Alkaloides.

(b) Discuss any two : 6

(1) Phenols and tannins.

(2) Volatile oils fatty acids and fatty acids.

(3) Peptides.

(4) Disaccharides.

(c) Answer any two in short : 4

(1) Lectins.

(2) Anthraquinones.

(3) Antibiotics.

(4) Sugar alcohols.

2 Answer any five in brief : 5

(1) What is general formula of carbohydrates ?

(A) $C_nH_{2n}O_n$ (B) $C_{2n}H_nO_n$

(C) $C_nH_{2n}O_{2n}$ (D) $C_nH_nO_n$

(2) The primary structure of a protein is maintained due to _____ bonds.

(3) Alkaloids are _____ types of substances.

(A) Acid (B) Neutral

(C) Chemical (D) Basic nitrogenous

(4) Glycosides are condensation products of :

(A) Sugar + aglycone (B) Sugar + protein

(C) Protein + aglycone (D) Fats + aglycone.

(5) $C_{40}H_{64}$ is the molecular formula of _____.

(6) Give any one examples of steroidal alkoloids.

(7) What are gums and mucilages ?

SECTION – II

3 (a) Describe any two in detail : 10

(1) Evaluation of natural anti-diabetic agents.

(2) Evaluation of natural microbial agents.

(3) Evaluation of anti-diarrheal agents.

(b) Discuss any two : 6

(1) Need for phyto-pharmacological evaluation.

(2) Microbial.

(3) Diabetic

(4) Herbal drugs

(c) Answer any two in short : 4

(1) Characteristics of Antimicrobial agent.

(2) Evaluation methods of diabetes.

(3) Give the name of drugs effects on diarrhea and diabetes.

(4) Natural sources of pharmacognosy.

4 Answer any five in brief : 5

(1) Give definition : Pharmacognosy.

(2) What is Diarrhoea ?

(3) Mention the name of two plants used in diabetes.

(4) How to prevent Diarrhoea ?

(5) In which disease Isabgual is used ?

(6) Give the name of Actinomycetes and fungi used against microbial disease.

(7) What is antimicrobial agents ?

(2) EBO - 405 : Plant Tissue Culture

Instructions :

(1) The question paper consists of two sections, each has three questions.

(2) All questions are compulsory and internal choice is provided.

(3) Write each section in separate answer sheet.

(4) Illustrate your answers with necessary diagram.

SECTION – I

1 Answer the following :

(a) Answer any two out of three : 10

(i) Describe stages involved in Micropropagation.

(ii) Explain protoplast culture.

(iii) Give application of plant tissue culture.

(b) Answer any two out of four : 6

(i) Write note on Components of Tissue culture media.

(ii) Write a note on chemical sterilization of explants.

(iii) Write on callus culture and its types.

(iv) Write on Hybrid selection regeneration.

(c) Answer any two out of four : 4

(i) Give Concept of cellular differentiation.

(ii) Give types of Hormones required for Rooting.

(iii) Give various uses of Autoclave.

(iv) What is Totipotency ?

2 Answer the following five out of seven : 5

(i) Define : somatic hybridization.

(ii) What is meristem culture ?

(iii) Name any two types of sterilization.

(iv) What is hybrid ?
(v) Define : Acclimatization.
(vi) Name types of auxins required in tissue culture.
(vii) Name hormones used for *in vitro* shoot formation.

SECTION – II

3 Answer the following :

(a) Answer any two out of three : **10**
  (i) Write a note on Clonal propagation.
  (ii) Discuss on pathogen resistant plants.
  (iii) Write note on germplasm storage.

(b) Answer any two out of four : **6**
  (i) Describe plant secondary metabolites production.
  (ii) Explain Molecular farming for bio plastic production.
  (iii) Discuss on salt stress resistant plant.
  (iv) Write note on Cryopreservation.

(c) Answer any two out of four : **4**
  (i) Write note on edible vaccines.
  (ii) Application of Transgenic Plants.
  (iii) Write note Herbicide resistant plants.
  (iv) Limitations of artificial seeds.

4 Answer the following five out of seven : **5**
(i) Name compound required for encapsulation of artificial seeds.
(ii) What is Oxidative stress ?
(iii) What is somatic embryogenesis ?
(iv) Name of Herbicide resistant transgenic plants.
(v) What is molecular farming ?
(vi) Differentiate the term plastic and bio plastic ?
(vii) Define the term Bio-reactor.

(3) EBO - 406 : Marine Botany
(Old & New Course)

Instructions :

(1) The question paper consists of two sections, each has two questions. Write answer of each section in separate sheet.

(2) All questions are compulsory.

(3) Illustrate your answers with necessary diagram if required.

SECTION - I

1 (a) Answer the following : (any two) **10**

(1) Describe oceans of the world.

(2) Explain physical factors - Temperature.

(3) Describe sewage as major pollutants.

(b) Answer the following : (any two) **6**

(1) Write in short sea as a biological environment.

(2) Explain tides effects on marine flora.

(3) Explain chemical composition of sea water.

(4) Describe agricultural discharge and its effects on marine biota.

(c) Answer the following : (any two) **4**

(1) Define : Sedimentation.

(2) Define : Salinity.

(3) Write main divisions of marine environment.

(4) Give the name of radioactive elements.

2 Answer the following : (any five) 5

(1) Define : Oceanography.
(2) Define : Continental drift.
(3) Define : Currents.
(4) Define : Bioremediation.
(5) Define : Marine environment.
(6) Give the two names of microorganisms.
(7) Give the two names of marine flora.

SECTION – II

3 (a) Answer the following : (any two) 10

(1) Explain factors affecting productivity.
(2) Describe costal flora of India.
(3) Describe uses of marine algae.

(b) Answer the following : (any two) 6

(1) Describe Haleophytes.
(2) Explain Algae of Saurashtra.
(3) Give the types of Marine phytoplankton.
(4) Write the uses of Mangroves.

(c) Answer the following : (any two) 4

(1) Short notes on Reproduction of Algae.
(2) Short notes on Seed germination of Marine Angiosperms.
(3) Write on biomass of marine phytoplankton.
(4) Write on Nitrogen metabolism of Marine Angiosperms.

4 Answer the following : (any **five**) 5

(1) Give the name of algal product.
(2) Write on uses of marine algae.
(3) Give the example of sea grasses.
(4) Define : Productivity.
(5) Write the example of Rhodophyta.
(6) Give the example of Chlorophyta.
(7) Define : Biomass.

CDP-902

Seat No._____

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

October - 2019

Botany : CBO - 404

(Angiosperm Taxonomy & Plant Reproduction)

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

Instructions :

(1) The question paper consists of two sections, each has two questions.

(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 : (two out of three) each of 7 marks : 14

(1) Write a note on : Bassaey's system of classification.

(2) Describes in short : International code of botanical nomenclature.

(3) Write a detailed note on Chemotaxonomy.

2 Answer the following : (three out of five) each of 05, 05 and 04 marks : 14

(1) Give the distinguishing characters of family Salvadoraceae.

(2) Describes the floral variation of family Cactaceae.

(3) Compare the floral diagram of Menispermaceae and Convolvulaceae.

(4) Write short note : Economic importance of Euphorbiaceae and Meliaceae.

(5) Compare the floral variation between Cyperaceae and Poaceae.

3 Answer the following : (four out of six) each 02, 02, 02 and 01 marks : 7

(1) Write in short computer as tool of taxonomy. (2)

(2) What is the roll of GIS in Taxonomy ? (2)

(3) Give the new name of family Guttiferae. (1)

(4) Give the systematic position of family Oleaceae. (2)

(5) What is gynandrophore ? Give an example. (2)

(6) Write the floral formula of family Chenopodiaceae. (1)

SECTION - II

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

(1) Write in short : Formation of vegetative and generative cell.

(2) Write a note on Scope of Palynology.

(3) Write note on : Tapetum.

5 Answer the following : (three out of five) each of 05, 05 and 04 marks : 14

(1) Explain the monosporic types of embryo sac development.

(2) What is double fertilization ? Explain in detail.

(3) Describe crucifer types of embryo development.

(4) Describe the ultra structure of an Embryo.

(5) Write note on : Polyembryo.

6 Answer the following : (four out of six) each 02, 02, 02 and 01 marks : 7

(1) Define : Microsporogenesis. (2)

(2) Write the name of anther wall layer. (2)

(3) The ovule of angiosperms can be called _____. (1)

(4) Which are the pollen viability tests ? (2)

(5) Write the roll of sucrose on in vitro pollen germination. (2)

(6) Define : Fertilization (2)

CDP-914 Seat No._____

M. Sc. (Sem. II) Examination

October - 2019

Botany : Paper - CBO - 405

(Plant Anatomy & Ecology)

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

Instructions :

(1) There are two sections in this question paper. Both are compulsory and carry equal marks.

(2) Write answer of section-I and II in separate answer books.

(3) Give your answer with neat and labeled diagram wherever required.

SECTION - I

1 Answer any two of the following questions : 14

(1) Explain : Korper-Kappe theory.

(2) Explain : Apical cell theory.

(3) Describe : Heartwood and sapwood.

2 Answer any three of the following questions : 14

(1) Describe : Anomalous secondary growth in Mirabilis stem. 5

(2) Explain : Nodal anatomy. 5

(3) Write on Trichomes. 4

(4) Describe : Structure variability in Heliathus leaf. 5

(5) Describe : Wound healing. 4

3 Answer any four of the following questions : 7

(1) Define : Complex tissue. 2

(2) Define : Porous wood. 2

(3) Define : Plant anatomy. 1

(4) Write the function of cambium. 2

(5) Write the function of stomata. 2

(6) Define : Anomalous secondary growth. 1

SECTION - II

4 Answer any two of the following questions : 14

(1) Describe : Carbon cycle.

(2) Describe : Non-conventional energy sources.

(3) Write the structure and function of ecosystem.

5 Answer any three of the following questions : 14

(1) Describe : National parks of Gujarat. 5

(2) Describe : Need and scope of Bioremediation. 5

(3) Explain : Forest conservation. 5

(4) Explain : Vegetation belt. 4

(5) Write on Bio-geographical zones - vegetation. 4

6 Answer any four of the following questions : 7

(1) Define : Ecosystem. 2

(2) Define : Biodiversity. 2

(3) Define : Biopiracy. 1

(4) Define : Conservation. 2

(5) Define : Plant Ecology. 2

(6) Define : Plant Geography. 1

CDP-924 Seat No._____

M. Sc. (Sem. II) Examination

October - 2019

Botany : Paper - CBO - 406

(Biophysics, Instramentation and Bio-Chemistry)

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

Instructions :

(1) There are two sections in this question paper. Both are compoulsory and carry equal marks.

(2) Write answer of section-I and II in separate answer book.

(3) Give your answer with neat and labeled diagram whenever required.

SECTION - I

1 Answer any two of the following questions : 14

(1) Law of thermodynamics. Describe it.

(2) Explain : Isotopes and their role in plant science.

(3) Describe : Buffers.

2 Answer any three of the following questions : 14

(1) Describe : Paper chromatography. 5

(2) Explain : Colorimetry and their application. 5

(3) Explain : Types of ultra centrifugation. 5

(4) Write on application of gel-filtration. 4

(5) Describe : Phase contrast. 4

3 Answer any four of the following questions : 7

(1) Define : Free radicals. 2

(2) Define : Radiation. 2

(3) Define : pH 1

(4) Write the application of spectrophotometry. 2

(5) Define : Electrophoresis. 2

(6) Write the full form of HPLC. 1

SECTION - I

4 Answer any two of the following questions : 14

(1) Write the structure and function of Disaccharides.

(2) Explain : Classification of Lipids.

(3) Explain : Classification of Amino acid.

5 Answer any three of the following questions : 14

(1) Describe : Structure of DNA. 5

(2) Explain : Classification of Proteins. 5

(3) Explain : Nomenclature of Enzymes. 5

(4) Write on function of various vitamins. 4

(5) Describe : Ramachandran plot. 4

6 Answer any four of the following questions : 7

(1) Define : Isomerism 2

(2) Define : Carbohydrates 2

(3) Write the functions of Lipids. 1

(4) Define : Apo-enzymes. 2

(5) Write the names of the various vitamins. 2

(6) Define : Enzymes. 1

CDP-933-934-935 Seat No._____

M. Sc. (Sem. II) Examination

October - 2019

Botany

(1) EBO - 404 : Phytochemistry & Pharmacology & Herbal Drugs

(2) EBO - 405 : Plant Tissue Culture

(3) EBO - 406 : Marine Botany

Time : 2 Hours] [Total Marks : 50

(1) EBO - 404 : Phytochemistry & Pharmacology & Herbal Drugs

Instructions :

(1) There are two sections in this question paper. Both are compulsory and carry equal marks.

(2) Write answer of section-I and II in separate answer book.

(3) Give your answer with neat and labeled diagram whenever required.

SECTION - I

1 Answer the following questions : 20

(a) Answer any two of the following questions : 10

(1) Describe : Monosaccharides.

(2) Explain : Gums and mucilages.

(3) Explain : Antibiotics.

(b) Answer any two of the following questions : 6

(1) Write on Lectins.

(2) Write on dextrins.

(3) Write on sugar acids.

(4) Write on cardiac glycosides.

(c) Answer any two of the following questions : 4

(1) Define : Sugar alcohols.

(2) Define : Inulin.

(3) Define : Peptides.

(4) Define : Phenols.

2 Answer any five of the following questions : 5

(1) Define : Phytochemistry.

(2) Define : Polysaccharides.

(3) Write physical properties of Alkaloids.

(4) Define : Glycosides.

(5) Define : Sugar amines.

(6) Define : Fatty acids.

(7) Define : Flavonols.

SECTION - II

3 Answer the following questions : 20

(a) Answer any two of the following questions : 10

(1) Write on Evaluation of anti diarrheal agents.

(2) Explain : Evaluation of anti microbial agents.

(3) Write on Evaluation of anti diabetic agents.

(b) Answer any two of the following questions : 6

(1) Write on uses of herbal drugs.

(2) Define : Diabetics.

(3) Define : Diarrhea.

(4) Define : Microbial agents.

(c) Answer any two of the following questions : 4

(1) Write uses of fenugreek.

(2) Write uses of Gymnea.

(3) Write uses of Aloevera.

(4) Write the plant name which is used to cure diabetics.

2 Answer any five of the following questions : 5

(1) Define : Herbal drugs.

(2) Define : Pharmacology.

(3) Define : Phyto - Pharmacological evaluation.

(4) Define : Anti diarrheal agents.

(5) Write the name of diseases in which Tinospora use.

(6) Define : Anti diabetic agents.

(7) Define : Drugs.

(2) EBO - 405 : Plant Tissue Culture

Instructions :

(1) There are two sections in this question paper.

(2) Each section contains two questions and carries 25 marks.

(3) Write answers of each section in separate answer book.

(4) Figures to the right indicate marks of questions.

(b) Answer any two of the following questions : 6

(1) Write on uses of herbal drugs.

(2) Define : Diabetics.

(3) Define : Diarrhea.

(4) Define : Microbial agents.

(c) Answer any two of the following questions : 4

(1) Write uses of fenugreek.

(2) Write uses of Gymnea.

(3) Write uses of Aloevera.

(4) Write the plant name which is used to cure diabetics.

2 Answer any five of the following questions : 5

(1) Define : Herbal drugs.

(2) Define : Pharmacology.

(3) Define : Phyto - Pharmacological evaluation.

(4) Define : Anti diarrheal agents.

(5) Write the name of diseases in which Tinospora use.

(6) Define : Anti diabetic agents.

(7) Define : Drugs.

(2) EBO - 405 : Plant Tissue Culture

Instructions :

(1) There are two sections in this question paper.

(2) Each section contains two questions and carries 25 marks.

(3) Write answers of each section in separate answer book.

(4) Figures to the right indicate marks of questions.

SECTION - I

1 (a) Describe in details : (any **two**) **10**

(1) Composition of MS nutrition medium.

(2) Sterilization techniques.

(3) Role of various plant growth regulators in plant tissue culture.

(b) Discuss : (any **two**) **6**

(1) Methods for protoplast fusion.

(2) Steam sterilization.

(3) Major stages involved in Somatic hybridization.

(4) Gelling agents of plant tissue culture nutrition medium.

(c) Answer in short : (any **two**) **4**

(1) Principle and uses of autoclave.

(2) Role of pH in nutrition medium.

(3) Carbon and energy sources in plant tissue culture nutrition medium.

(4) Scope of plant tissue culture.

2 Answer the following : (any **five**) **5**

(1) Define : Explant.

(2) Explain : Hardening.

(3) Name the scientist who made first attempt of plant tissue culture.

(4) Explain : Micropropagation.

(5) Scientific name of the plant used by Steward for regeneration of embryos from callus.

(6) Explain : Totipotency.

(7) Give the name of plant hormones used to develop shoot and root in callus.

SECTION - II

3 (a) Describe in details : (any **two**) **10**

(1) Secondary metabolites and their types.

(2) Artificial seed production and its advantages.

(3) Cryopreservation and its significance.

(b) Discuss : (any **two**) **6**

(1) Role of transgenic plants in Agriculture.

(2) Steps to produce stress resistant plants.

(3) Compounds having cryopreservation properties.

(4) Problems associated with secondary metabolite production.

(c) Answer in short : (any **two**) **4**

(1) Phyto-alexins.

(2) Herbicide resistance.

(3) Significance of Germplasm storage.

(4) Biodegradable plastic.

4 Answer the following : (any **five**) **5**

(1) Define : Antibody.

(2) Explain : Polymer.

(3) Name the Transgenic tomato produced using antisense RNA gene.

(4) What are pathogens ?

(5) Write full form of TTC.

(6) Explain : Oxidative stress.

(7) Give the temperature of liquid N_2 at which plant material is frozen and maintained.

(3) EBO - 406 : Marine Botany

Instructions :

(1) The question paper consists of two section, each has two question.

(2) All questions are compulsory. In each section 1st question divide into - a (10 marks), b(06 marks) and c(04 marks) and IInd question carry 05 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 (a) Answer the following : (two out of three) each of 05 marks : **10**

(1) Write the effect of temperature on marine flora ?

(2) Describe : sewage as a marine pollutant

(3) Write note on SEA as a biological environment.

(b) Answer the following : (two out of four) each of 03 marks : **6**

(1) Write the chemical composition of water.

(2) Describe zones of marine environment.

(3) Describe : minerals of sea water.

(4) Micro-organisms of marine flora.

(c) Answer the following : (two out of four) each of 02 marks : 4

(1) Describe : salinity of sea water.

(2) What is tides ?

(3) Explain in short : continental drift.

(4) Write any two effect of radioactive elements on marine biota.

2 Answer the following : (five out of seven) each of 01 mark : 5

(1) What is pollutant ?

(2) Explain : Bio remediation

(3) Define : pollution.

(4) Write any two of tides ?

(5) Define : pH

(6) What is most abundant salt in sea ?

(7) What is oceanography ?

SECTION - II

3 (a) Answer the following : (two out of three) each of 05 marks : 10

(1) Write the salient features of marine chlorophyta (algae)

(2) Describe : Costal flora of India.

(3) Write the salt uptake and translocation of marine angiosperms.

(b) Answer the following : (two out of four) 6
each of 03 marks :

(1) Write the types of marine phytoplankton.

(2) Describe : Sea grasses.

(3) Describe : Uses of mangroves.

(4) Nitrogen metabolism of marine angiosperms.

(c) Answer the following : (two out of four) 4
each of 02 marks :

(1) Write the general characters of phaeophyta.

(2) Write the any two uses of marine algae.

(3) Describe : Helophytes.

(4) Describe : Bio mass.

4. Answer the following : (five out of seven) 5
each of 01 mark :

(1) What is phytoplankton.

(2) Write the any marine algal products.

(3) Write the any two name of rhodophycien algae of Gujarat.

(4) Write the any two name of mangroves ?

(5) Agar agar is obtain from _____?

(6) Which pigment is dominant in red algae ?

(7) Sargasso sea is named after an algae sargassum belongs to _____ family ?

ACA-3854

Seat No._____

M. Sc. (Physics) (Sem. II) Examination

March / April – 2019

CPH - 501 : Electrodynamics & Microprocessor

Time : 3 Hours] [Total Marks : 70

Instructions : (1) Symbols have their usual meanings.
(2) Figures on R.H.S. indicate marks of each question.

1 (a) Answer the following : (Any **One**) **10**

(1) Define retarded potential, retarded time and advance time with formula and explain Lienard-Wiechart potential.

(2) Explain boundary conditions and Pointing theorem with necessary equations.

(b) Answer the following : (Any **Two**) **4**

(1) Using the relativistic electrodynamics derive electrical force on charge q and using Maxwell's stress tensor derive total force on charge by both fields.

(2) Explain about conservation of momentum and angular momentum.

2 (a) Answer the following : (Any **One**) **10**

(1) What is radiation ? Derive equation of electric and magnetic fields by electric. dipole radiation.

(2) Explain Larmor formula for power radiated by a point charge

(b) Answer the following : (Any **One**) **4**

(1) Discuss about Radiation Reaction and derive Abraham Lorentz formula for radiation reaction force.

(2) Obtain the equation of the energy flux for magnetic dipole radiation.

3 (a) Answer the following : (Any **One**) **10**

(1) Draw logic pin out diagram of microprocessor and explain functions of each pin.

(2) (a) Write note on 'Demultiplexing multiplexed A/D bus'

(b) Explain ROM and RAM memory in detail.

(b) Answer the following : (Any **One**) **4**

(1) With proper diagram explain how we can generate $\overline{\text{MEMW}}$ signal.

(2) Explain two types of microprocessor applications.

4 (a) Answer the following : (Any **One**) 10

(1) Explain. 16 bit data transfer instruction and write a program to add 2626H and 8585H. Write your expected answer.

(2) (a) Explain logic operation Rotate right with and without carry.

(b) Explain instructions for different Arithmetic operation

(b) Answer the following : (Any **One**) 4

(1) Write a program to find l's compliments of data. 32 H stored in accumulator and store result at M.L. 8501 H

(2) Write a program to load llH registers A L,C and H.

5 Answer the following : (Any **Seven**) 14

(1) In which case of linear media the boundary condition is expressed in terms of _____ and _____

(2) Write equation of Biot-Savart law with time-dependent generalization

(3) From an arbitrary source what is the radiated total power ?

(4) Which theorem is the work-energy theorem of electrodynamics ?

(5) Write Maxwell's equations for free space.

(6) Give the full form of ALE and ALU.

(7) Write instruction to load 36H in register L.

(8) Convert binary 1001000 to decimal.

(9) Explain instruction MVI B, 22H

(10) Write instruction to store data D4 in register C.

CDP-904 Seat No._____

M. Sc. (Sem. II) Examination

October - 2019

Physics : CPH - 501

(Electrodynamics & Microprocessor)

(Old Course)

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

1 (a) Attempt any **one** : **10**

(1) Explain charge conservation. Derive differential version of the Poynting theorem.

(2) What is bound current ? Obtain Maxwell's equations in matter and explain them.

(b) Attempt any **one** : **4**

(1) Find the potentials of a point charge moving with constant velocity.

(2) What is bound current ?

2 (a) Attempt any **one** : **10**

(1) Explain the magnetic dipole radiation, obtain the formulation for energy flux and total power radiated.

(2) Find the vector potential (A) as a function of r, θ and t in case of electric dipole radiation.

(b) Attempt any **one** : **4**

(1) Explain magnetism as a relativistic phenomenon and general transformation rules for electromagnetic field.

(2) Using relativistic electrodynamics calculate electric force on charge q.

3 (a) Attempt any **one** : **10**

(1) Explain any five pins of 8085 microprocessor.

(2) What is decoder ? Explain any type of decoder with truth table and logical circuit diagram.

(b) Attempt any **one** : **4**

(1) How many address lines are required to Interface 2K byte of memory ?

(2) Draw and explain generation of MEMR signal.

4 (a) Attempt any **one** : **10**

(1) Explain 16 bit data transfer instructions and write a program to add 1234 H and 9876 H.

(2) Explain two copies and two arithmetic instruction with suitable example.

(b) Attempt any **one** : **4**

(1) Write a program to subtract 22H and 99 H and write answer in register C.

(2) Write a program to load 55 H in Registers A,B,C and H.

5 Attempt any **seven** : **14**

(1) What is the total power radiated by a point charge ?

(2) What is Maxwell equation in terms of free charge and current ?

(3) Define software.

(4) What is the application of rotate instruction ?

(5) From an arbitrary source what is the radiated total power ?

(6) Explain magnetization results in bound current.

(7) What is the energy radiated by the magnetic dipole ?

(8) Write the full form of E^2PROM.

(9) Explain the function of RD' and WR' pins.

(10) Give the full name of CPU and ALU.

3 (a) Attempt any one out of two : 10

(1) Explain one dimensional array with block structure and write a programme to calculate summation up to 10.

(2) Explain do while loop and write a programme $Y = X^n$ where n is non-negative integer using do while statement.

(b) Attempt any one out of two : 4

(1) Explain two dimensional array initialization using block structure.

(2) Explain procedure for skipping a part of a loop.

4 (a) Attempt any one out of two : 10

(1) Explain Multi-function programme with appropriate blocks and flow chart.

(2) Explain string array. Write a programme to read series of words from a terminal.

(b) Attempt any one out of two : 4

(1) Write a programme to multiply two integer using function.

(2) Briefly explain need for user defined function.

5 Attempt any seven out of ten : 14

(1) Define : Generating function.

(2) Explain term jump out loop.

(3) Poisson brackets are commutative, do you agree ?

(4) Explain function "gets".

(5) _____ is the generator of infinitesimal rotational motion of system.

(6) What header file is needed to print character ?

(7) Define principle mode of oscillation of system.

(8) What do you mean by damped oscillation ?

(9) Give classification of rigid bodies.

(10) Define principle mode of oscillation of system.

CDP-926 Seat No._____

M. Sc. (Sem. II) Examination

October - 2019

Physics : CCCPH - 503

(Nanotechnology)

Time : **3** Hours] [Total Marks : **70**

Instructions :

(1) Symbol have their usual meaning.

(2) Figure to the right indicate marks of the question.

1 (a) Answer the following : (any **one**) **10**

(1) Explain following application of Nanotechnology.

(1) Nanomedicine

(2) Information and Communication.

(2) Discuss about fullerenes and its properties.

(b) Answer the following : (any **one**) **4**

(1) Write a short note on "Use of Nanotechnology in Heavy Industry".

(2) Describe "Production of Nanoparticles".

2 (a) Answer the following : (any **one**) **10**

(1) What is QUANTUM DOT ? Explain its optical properties and fabrication.

(2) Discuss about Nanocrystal.

(b) Answer the following : (any **one**) 4

(1) Explain Light-Emitting Device(LED) by using quantum dots.

(2) Write a short note on "Nanocrystal solar cell".

3 (a) Answer the following : (any one) 10

(1) Write the definition of biosensors and explain its three parts and principles of detection.

(2) Explain following Nanobiotechnological devices.

(a) Nanoparticles

(b) Dendrimers

(c) Nanorobots.

(b) Answer the following : (any one) 4

(1) Explain photodynamic therapy.

(2) Explain use of Nanotechnology in cancer diagnosis and therapy.

4 (a) Answer the following : (any one) 10

(1) Explain Scanning Probe Microscope (SPM) with its advantages and disadvantages.

(2) Describe water and waste water treatment, water conservation, water purification and water management.

(b) Answer the following : (any one) 4

(1) Explain Scanning Tunnelling Microscope in brief.

(2) Explain basic of economic disruption.

5 Attempt any **seven** : 14

(1) What is Nanocomputer ?

(2) What is Nanobuds ?

(3) List the application of quantum well.

(4) What is the difference between nanobiosensors and biosensors ?

(5) Write the full name of Nubot.

(6) Write the four imaging mode of Atomic Force Microscope.

(7) Write the name of material whose nanoparticles glow when exposed to ultraviolet light.

(8) Why is known as direct detection biosensors ?

(9) Write the full name of PFM and MFM.

(10) Write the name of three nanolithography techniques.

CDP-939-940-941 Seat No._____

M. Sc. (Sem. II) Examination

October - 2019

Physics

(1) EPH - 501 Energy Technology & Storage System) (Elective (Old Course)

(2) EPH - 502 : Synthesis of Materials

(3) EPH - 503 Experimental Technologies (Old Course)

Time : 2 Hours] [Total Marks : 50

(1) EPH - 501 Energy Technology & Storage System) (Elective (Old Course)

1 (a) Attempt any one : 10

(1) What is Geo thermal energy ? Explain it. Describe applications of it with utilization of geo thermal energy.

(2) Give brief introduction of wind energy. Explain applications and Historical background of wind energy.

(b) Attempt any one : 6

(1) State various principle routes of biomass energy conversion to useful energy.

(2) Describe the advantages and limitations of the ocean energy conversion technology.

(c) Attempt any one : 4

(1) Explain types of wind turbine.

(2) Discuss the important aspects of the geothermal energy.

2 (a) Attempt any one : 10

(1) What are energy storage system ? Explain in detail.

(2) Explain energy storage in high pressure hydraulic accumulator.

(b) Attempt any two : 6

(1) List the non-electrical energy storage system.

(2) Write short note on acid battery cell.

(3) Give electrical schematic and main componeuts of SMES system.

(c) Attempt any one : 4

(1) Which qualities must posses for the latent heat storage medium ?

(2) Which are distinct categories of chemical energy storage ?

3 Attempt any five : 10

(1) What is planetary winds local winds ?

(2) Define ocean tidel energy.

(3) State the name of row biomass for waste.

(4) Mention the criteria for choice of the type of battery.

(5) Define compressed air storage.

(6) What is oceanography ?

(7) Define power in wind stream.

(2) EPH - 502 : Synthesis of Materials

1 (a) Attempt any **one** : 10

(1) Describe an experimental procedure to prepare samples using a solid state reaction method.

(2) Explain vacuum evaporation technique for thin film production.

(b) Attempt any **two** : 6

(1) Discuss Chemical Vapor Deposition (CVD) technique for synthesis of hinkal.

(2) Explain heat treatment and analysis of solid state function.

(3) Explain vacuum evaporation technique for thin film production.

(c) Attempt any **one** : 4

(1) Write disadvantages of solid state reaction method.

(2) Describe sputtering technique for the synthesis of thin film.

2 (a) Attempt any **one** : 10

(1) Explain epitaxial growth of thin layers.

(2) Discuss vapour phase transport method.

(b) Attempt any **two** : 6

(1) Describe Czochralski method for the growth of single crystal

(2) Discuss silica for Optical Fibre.

(3) Explain 'Flux Method'.

(c) Attempt any **one** : 4

(1) Explain precipitation from solution flux method.

(2) Explain Bridgman method for the growth of single crystal.

3 Attempt any **five** : 10

(1) What do you understand by Sol-gel ?

(2) List the difference between Czochralski and Stockburger Method.

(3) What do you understand by Dip Coating ?

(4) What is reagent ?

(5) What is ceramic material ?

(6) Why heat treatment is necessary in solid state function ?

(7) Write chemical formula forTin Dioxide and Silica.

(3) EPH - 503 Experimental Technologies
(Old Course)

1 (a) Attempt any **one** : 10

(1) Discuss the production of X-ray.

(2) Explain nuclear magnetic energy levels.

(b) Attempt any **two** : 6

(1) Write a short note on NMR spectrometer.

(2) Write a short note on ESR spectrometer.

(3) Explain in short X-ray detector.

(c) Attempt any **one** : 4

(1) What is XFS ? Explain.

(2) What is hyperfine interactions ?

2 (a) Attempt any **one** : 10

(1) How to operate mass spectrometer ? Explain.

(2) Explain 57 Fe Mossbauer spectroscopy.

(b) Attempt any **two** : 6

(1) Explain principle of Mass spectrometer.

(2) Write short note on IR spectroscopy.

(3) Write application of Mass spectroscopy.

(c) Attempt any **one** : 4

(1) Discuss correlation of IR spectra with molecular structure.

(2) Explain nuclear hyperfine structure.

3 Attempt any **five** : 10

(1) What is spectroscopy ?

(2) Write wave length of X-ray

(3) What is collimator ?

(4) Write basic principle of NMR.

(5) Write the uses of Mossbauer spectroscopy.

(6) What is fluorescence ?

(7) What is mass spectrum ?

ACA-3888-89

Seat No. _____

M. Sc. (Sem. II) Examination

March / April - 2019

Physics (Elective)

(A) EPH501 : Energy Technology & Storage Systems

(B) EPH502 : Synthesis of Materials

Time : 2 Hours] [Total Marks : **50**

(A) EPH501 : Energy Technology & Storage Systems

Instructions : (1) Symbols have their usual meaning.
(2) Figures to the right indicate marks of the question.

1 (a) Answer the following : (any **two**) **10**

(1) Explain hydro geothermal energy resources. State its merits.

(2) Explain Ocean energy resources.

(3) Describe the various principal routes of biomass energy conversion to useful energy.

(b) Answer the following : (any **one**) **6**

(1) What is hot rock geothermal source? How is it used?

(2) Write important aspects of geothermal energy.

(c) Answer the following : (any **one**) **4**

(1) What are units of the electrical generator with the wind turbine?

(2) Give important aspects of geothermal energy.

2 (a) Answer the following : (any **two**) **10**

(1) Explain the consumption construction and working of Ni-Cd Battery.

(2) State the advantage and limitation of superconducting magnet storage system.

(3) Discuss advantage and limitation of superconducting magnet storage system.

(b) Answer the following : (any **one**) **6**

(1) Explain the thermal and thermal sensitive energy storage systems.

(2) Discuss the functioning advance battery.

(c) Answer the following : (any **one**) **4**

(1) With suitable chemical reaction comma explain how lead acid battery works.

(2) What are challenges in energy storage systems?

3 Answer the following : (any **five**) **10**

(1) What do you mean by wind turbine efficiency?

(2) What is the range of energy available from ocean?

(3) State applications of Advanced battery storage?

(4) Under which situations the wind energy not reliable.

(5) How power is determined in a wind stream?

(6) Define geothermal energy.

(7) Define power in wind stream.

(B) EPH502 : Synthesis of Materials

Instructions : (1) Symbols used have usual meaning.
(2) Figures on the right indicate marks of the question.

1 (a) Answer the following : (any **one** out of two) **10**

(1) Write notes on 'Chemical Vapour Deposition (CVD) technique' for synthesis of thin film.

(2) Discuss general principle of ceramic method. Also describe an experimental procedure to prepare samples using a solid state reaction method.

(b) Answer the following : (any **one** out of two) **6**

(1) Explain 'Pulse Laser Deposition (PLD) technique' for synthesis of thin film.

(2) Give the disadvantages of solid state reaction.

(c) Answer the following : (any **one** out of two) **4**

(1) Write note on Cathode sputtering.

(2) Explain heat treatment and analysis of solid state reactions.

2 (a) Answer the following : (any **one** out of two) **10**

(1) Explain an experimental procedure to prepare Lithium Niobate [$LiNbO_3$] samples using sol-gel route.

(2) Discuss "Vapour phase transport methods".

(b) Answer the following : (any **one** out of two) **6**

(1) Discuss 'Czocharalski Method for growth of single crystals.'

(2) Explain 'Flux method'.

(c) Answer the following : (any **one** out of two) **4**

(1) Explain precipitation from solution flux method.

(2) Draw relevant Schematic of flux method.

3 Answer the following : (any **five** out of seven) **10**

(1) What do you understand by doped Tin Dioxide?

(2) Why chemical routes are considered better than ceramic route ?

(3) What is 'Sputtering' ?

(4) What do you understand by Dip Coating ?

(5) What is reagent ?

(6) Write chemical formula for Tin Dioxide and Silica.

(7) What is 'Ceramic material' ?

CDP-938

Seat No._____

M. Sc. (Sem. II) Examination

October - 2019

Microbiology : MBEL - 11

(Food & Dairy Microbiology)

Time : **2** Hours] [Total Marks : **50**

Instructions :

(1) All questions are compulsory.

(2) Write each section in separate answer books.

SECTION - I

1 Discuss the following : **10**

Types of food spoilage.

OR

Preservation of food by physical methods.

2 Answer the following : **10**

Explain characteristics of an ideal chemical food preservatives.

OR

Discuss Clostridial food intoxication.

3 Write note on the following : **5**

Radiation as method of food preservation.

OR

Application of organic acids as food preservative.

SECTION - II

4 Answer the following : 10

Discuss the microbiology and recovery of wine and beer.

OR

Describe the role of starter culture in fermented dairy products.

5 Describe the following : 10

Single cell protein and its nutritional value.

OR

Leavening of bread.

6 Write note on the following : 5

Fermented Indian food.

OR

Fermented pickels.

CDP-903 Seat No._____

M. Sc. (Sem. II) Examination

October - 2019

Microbiology : Paper CC - 201

(Molecular Genetics of Bacteria & Bacteriophages)

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

SECTION-I

1 Answer the following : **14**

(a) With suitable explain the negative regulation of operon.

(b) Molecular mechanism of conjugation in bacteria.

OR

(a) Explain with suitable example mutagenesis induced by chemical mutagens.

(b) Discuss with specific example point mutation in bacteria.

2 Describe the following : **14**

(a) Properties of plasmids and discuss cryptic plasmid and its applications.

(b) Transfer of plasmid by $F^+ \times F^-$ and $HFR \times F^-$.

OR

(a) Properties and mechanism of replication of transposable elements.

(b) Agrobacterium mediated gene transfer in higher plants.

3 Answer in brief : 7

(1) What are biologica mutagens ? Give two examples.

(2) Mechanism of UV radiation on bacterial DNA.

(3) What is attenuation control ?

(4) What is bactreiocinogen ?

(5) What are jumping genes ?

(6) What are insertion sequences ?

(7) Draw a typical bacteriophage and label it.

SECTION - II

4 Answer the following : 14

(a) DNA replication in T4 bacteriophage.

(b) Mechanism of gene transfer and gene mapping by transformation.

OR

(a) Explain the lytic- cycle in bacteriophages.

(b) Discuss the Bacterial pathogenesis associated with Lysogenic phages.

5 Describe the following : 14

(a) Application of microbial physiology and metabolic pathways for investigation of bacteria.

(b) Construction of bacterial strains by gene fusion technique.

OR

(a) Biochemistry of nitrogenase action.

(b) Explain the sporulation in bacillus species.

6 Answer in brief : 7

(1) What are Prions ?

(2) What is operon ?

(3) What is phage titer ?

(4) What is epidemiology ?

(5) Define conjugation.

(6) Give two important properties of nitrogenase enzyme.

(7) At what level feedback inhibition and feedback repression works ?

CDP-915 Seat No. _____

M. Sc. (Sem. II) Examination

October - 2019

Microbiology : Paper - MB - 202

(Research Methodology & Professional Practices)

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

Instructions :

(1) All questions are compulsory.
(2) Write both sections in separate answer book.

SECTION - I

1 (a) Discuss the characteristics of research. 07
(b) Briefly explain various methods of data collection. 07

OR

(a) Explain how would you prepare a poster for conference presentation. 07
(b) Describe the criteria for writing a scientific research proposal. 07

2 (a) Write a note on measures of central tendency and standard error. 07
(b) Discuss salient features of binomial, poison and normal distributions. 07

OR

(a) Discuss the student's test with its importance. 07
(b) How level of significance is determined ? Give its importance in data analysis. 07

3 Write short note on any **two** of the following : **07**

(a) Chi square analysis in biological sciences.

(b) Applications of non parametric statistics in biological research.

(c) Components of research dissertation.

SECTION - II

4 (a) Write a note on multiple sequence alignment. **07**

(b) Write a note on significance of internet in modern scientific research. **07**

OR

Discuss the application of bioinformatics in genomic research and give its significance. **14**

5 Discuss briefly the concept of GLP and GMP for quality control in life science research. **14**

OR

(a) Briefly explain the regulatory issues in biotechnology industries. **07**

(b) Discuss the significance of ISO in biotechnological industry. **07**

6 Write short notes on any **two** of the following : **07**

(a) CLUSTAL W

(b) BLAST AND FASTA

(c) Microbial identification through gene sequencing.

CDP-925

Seat No._____

M. Sc. (Sem. II) Examination

October - 2019

Microbiology : Paper - MB - 203

(Bioprocess & Biochemical Engineering)

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

Instructions :

(1) All questions are compulsory.

(2) Write both sections in separate answer book.

SECTION - I

1 Differentiate the primary and secondary metabolism in microorganisms and significance in their life. **14**

OR

1 Explain the application of r-DNA technology for improving capacities of microorganisms for industrial applications. **14**

2 Explain application of auxotrophic mutant for over production of industrial products with suitable example. **14**

OR

2 (a) Discuss the importance of raw materials in industrial media. **7**

(b) Write in short on continuous stirred tank reactor. **7**

3 Do as directed : 7

(1) What are Auxotrophic mutants ?

(2) Complete removal of which element from media triggers secondary metabolism ?

(3) What is derepression of genetic information.

(4) By which name primary and secondary metabolic phase are identified ?

(5) What do you understand by complex media ?

(6) What are probiotics ?

(7) What are biopesticides ?

SECTION - II

4 (a) Discuss the cardinal rules for bioreactor design. 7

(b) Discuss the scale up in industrial bioprocesses. 7

OR

4 Discuss in detail the process control in industrial fermentation. 14

5 Define downstream process and briefly explain the steps of downstream processing with their advantages and limitation. 14

OR

5 Write short notes on the following :

(a) Mechanical methods for cell disruption. 7

(b) Filteration process for separation of solid and liquid. 7

6 Do as directed : 7

(1) What is head space in bioreactor ?

(2) Define scale up.

(3) What do you understand by redox potential ?

(4) Differentiate between antifoam and defoaming agent.

(5) Define homogenization.

(6) Differentiate between aerator and sparger.

(7) Give two examples of cross linking agents for immobilization by entrapment method.