SIR P T SCIENCE COLLEGE, MODASA

INTERNAL TEST-2022

M.Sc Botany-Sem-II

BOT CC-201

DT. TIME: 1.30 hrs. MARKS:40

INSTRUCTION: 1.All the questions are compulsory and all questions carry equal marks.
2. Illustrate your answers with neat and labeled diagrams.

Q-1.Describe. (any two) **Marks.16**

1. Vegetative propagation in bryophytes.
2. Evolution of sporophytes in bryophytes.
3. Ecological importance of bryophytes.

Q-2.Describe. (any two) **Marks.16**

1. Stele in pteridophyta.
2. Economic importance of pteridophytes.
3. Telome theory.

Q-3.Write answer in short. (any four) **Marks.8**

1. Any two economic importance of bryophytes.
2. What are Gemmae?
3. Define: Peristome.
4. Define: Heterospory.
5. What is apospory?
6. What is strobilus?

SIR P T SCIENCE COLLEGE, MODASA

INTERNAL TEST-2022

M.Sc Botany-Sem-II

BOT CC-202

DT. TIME: 1.30 hrs MARKS:40

INSTRUCTION: 1.All the questions are compulsory and all questions carry equal marks.
2. Illustrate your answers with neat and labeled diagrams.

Marks.16

Q-1.Describe. (any two)

1. Apical cell theory.
2. Porous and non porous wood.
3. Anomalous secondary growth in *Mirabilis* stem.

Marks.16

Q-2.Describe. (any two)

1. Structure of ovule.
2. Types of embryo sac development.
3. Applications of polyembryony.

Marks.8

Q-3.Write answer in short. (any four)

1. What are annual rings?
2. Function of transfusion tissue.
3. Define cambium activity.
4. Define: Palynology.
5. What is embryogenesis?
6. What is double fertilization?

SIR P T SCIENCE COLLEGE, MODASA

INTERNAL TEST-2022

M.Sc Botany-Sem-II

BOT CC-203

DT. TIME: 1.30 hrs MARKS:40

INSTRUCTION: 1.All the questions are compulsory and all questions carry equal marks.
2. Illustrate your answers with neat and labeled diagrams.

Q-1.Describe. (any two) **Marks.16**

1. Classification of amino acids.
2. Properties of enzymes.
3. Biosynthesis of phospholipids.

Q-2.Describe. (any two) **Marks.16**

1. Law of thermodynamics.
2. ESR spectroscopy.
3. Isotopes and their role.

Q-3.Write answer in short. (any four) **Marks.8**

1. What are complex lipids?
2. What is isomerism?
3. Define: Inhibition.
4. Define: Buffer.
5. Full form of HPTLC?
6. What is electrophoresis?

SIR P T SCIENCE COLLEGE, MODASA

INTERNAL TEST-2022

M.Sc Botany-Sem-II

BOT CC-204

DT. TIME: 1.30 hrs MARKS:40

INSTRUCTION: 1.All the questions are compulsory and all questions carry equal marks.
2. Illustrate your answers with neat and labeled diagrams.

Q-1.Describe. (any two) **Marks.16**

1. Methods of data collection.
2. Significance of scientific communications.
3. Writing research proposal.

Q-2.Describe. (any two) **Marks.16**

1. Non parametric tests.
2. Level of bio-safety.
3. Intellectual property protection.

Q-3.Write answer in short. (any four) **Marks.8**

1. What is research?
2. What is a citation?
3. Define: Impact factor.
4. Define: Probability.
5. Give the types of parametric tests.
6. Types of patents?

Formula indicate Mark

JCV-2521 Seat No. 204

M. Sc. (Sem. II) Examination

June – 2022

CHN-501(I) : Inorganic Chemistry

Time : 2:30 Hours] [Total Marks : 70

1 Answer any two :

(1) Explain Tanabe Sugano diagram for d^2 ion.

(2) Calculate the microstates of d^2 electronic configuration, describe the term symbol for all the states arising from it. Arrange them in increasing order of stability.

(3) Draw Orgel diagram for Co^{+2} ion in tetrahedral and Octahedral field and discuss briefly.

2 Answer any two :

(1) Write a short note on Polynuclear Carbonyl.

(2) Explain how do structure prediction for carbonyl clusters by Wade's rules.

(3) Calculate the EAN of $Co_4(CO)_{12}.Co_2(CO)_8.Cr(CO)_6$ and draw the Coulson's molecular orbital energy level diagram for Carbonyl.

3 Answer any two :

(1) Discuss synthesis and structure of Deca Borane-14 and discuss the structure of diborane.

(2) Write a note on "Metallo Carboranes".

(3) Discuss the Poly hedral Skeletal Electron Pair Theory for Borane Cage.

4 Answer any two :

(1) Explain the structure of $(CH_3Li)_4$ and report what is the coordination No. of Carbon.

(2) Explain the structure of $(Me_3Al)_2$. How many 3c-2e bond present in $(Me_3Al)_2$.

(3) Explain : Keggin's Theory.

JCV-2522 Seat No. _____

M. Sc. (Sem. II) Examination

June - 2022

CHNN:502 : Organic Chemistry

(New Course)

Time : 2.30 Hours] [Total Marks : 70

Instructions : All the questions are compulsory,

1 Answer any two of following. 17

(1) Discuss the unimolecular electrophilic aliphatic substitution (SE_1) with mechanism.

(2) Write a note on orientation and reactivity in mono substituted benzenes.

(3) Discuss the following name reactions.

(i) Vilsmeier reaction.

(ii) Gattermann - Koch reaction.

2 Answer any two of following. 18

(1) Give account on aromatic nucleophilic substitution reaction via benzyne.

(2) Write sommelet-hauser rearrangement with mechanism.

(3) Explain stereochemical aspects of addition reactions of alkene.

(4) Write a note on Hydroboration of alkenes.

3 Answer any two of following. 17

(1) Discuss the reactions of any two metal hydrides on saturated and unsaturated carbonyl compounds, acids and esters.

(2) Explain "Knoevenagel reaction."

(3) Give the comparison between E_1, E_2, and E_1cb reactions.

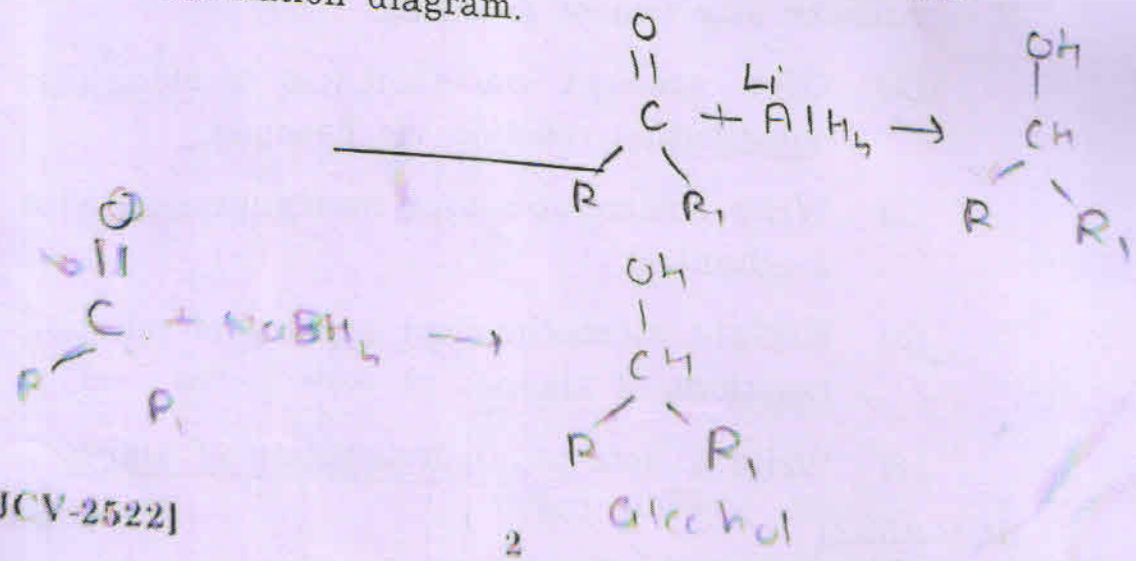
(4) Describe the effects of substrate structure, attacking base, the leaving group and solvent on E_2 reaction.

4 Answer any two of following. 18

(1) Explain the molecular orbital symmetry of 1,3 -butadiene with symmetry Properties.

(2) Discuss the conrotation and disrotation process for 4n and 4n+2 systems with suitable examples.

(3) Discuss the Diels-Alder reaction with the correlation diagram.



JCV-2523

Seat No. ______

M. Sc. (Sem. II) Examination

June - 2022

CHNN : 503 : Physical Chemistry

Time : **2.30** Hours] [Total Marks : **70**

Constants :

$R = 8.314$ Joule/mol, K, (MKS)

$R = 1.987$ Calorie/mol, K,

$K = 1.38 \times 10^{-16}$ erg/mol. K. (CGS)

$K = 1.38 \times 10^{-23}$ Joule/mol. K. (MKS)

$h = 6.626 \times 10^{-27}$ erg. Sec. (CGS)

$h = 6.626 \times 10^{-34}$ Joule. Sec. (MKS)

$C = 3.0 \times 10^{10}$ cm/Sec

1 (A) Give the answer any one **9**

(1) Write a short note : Hinshelwood theory.

(2) Write a short note : Transition state theory.

(B) Give the answer any one **9**

(1) The reaction rate of reaction to be 7.2×10^{-5} and 8.3×10^{-4} at 300 K and 320 K. Calculate the Arrenhenius frequency factor,

(2) A reaction is first order in A and second order in B.

(i) Write the differential rate equation.

(ii) How is the rate affected When the concentration of B is three times?

(iii) How is the rate affected When the concentration of both A and B are doubled?

2 (A) Give the answer any two, 17

(1) Write a short note : BET equation.

(2) Write a short note : Micellization.

(3) Explain: (i) CMC (ii) Factor affecting on CMC (iii) Counter ion binding to micelles.

(4) Explain: Laplace equation.

3 (A) Give the answer any one 9

(1) Explain: Kinetics of cataonic polymerization,

(2) Explain: Various types of polymers.

(B) Give the answer any one.. 9

(1) A polymer sample contains 35% : 65% Weight ratio of particle with molecular weight 40000 and 60000 respectively. Calculate the PDI of polymer.

(2) An equimolar mixture of two substance has $\overline{M_n}$ = 1000 gm/mol and $\overline{M_w}$ = 15000 gm/mol. Calculate the respective molar masses,

4 (A) Give the answer any one 9

(1) Explain; Donnan membrane equilibrium when (a) The electrolyte on both sides have no common ions. (b) One of the electrolytes contains polyvalent ions.

(2) (a) Nernst-plank equation (b) Tafel plot,

(B) Give the answer any one. 8

(1) The value of overvoltage is 0.35 V. Calculate the overvoltage under the condition, when the magnitude of electric current is increased by ten times and value of b is 0.12

(2) Determine the diffusion current for nickel. Concentration of solution is 2.5 m. Time is 7 sec. weight of drop is 4.2 mg/sec. n = 2, D = 0.7×10^{-5} cm^2/sec.

JCV-2524

Seat No. _____

M. Sc. (Sem. II) Examination

June - 2022

CHNN504 : Chemistry

(Spectroscopy Part-II)

Time : 2:30 Hours] [Total Marks : 70

Instructions : (1) All questions are compulsory.
(2) The medium of answers is English only.

1 Answer any two of the following. 17

(1) Explain Franck-Condon principle with suitable examples.

(2) Write a note on Russell-Saunders coupling approximation with vector representation.

(3) What is a diffuse spectrum? Explain in detail.

(4) Explain spectra of alkali metal atoms.

2 Answer any two of the following. 18

(1) Explain rotational Raman spectra of diatomic and linear polyatomic molecules.

(2) Write a note on resonance Raman spectroscopy

(3) With the proper derivations discuss the classical theory of Raman effect.

(4) Write a note on vibrational and vibrational-rotation Raman spectra.

3 Answer any two of the following 17

(1) Explain Linear, symmetric rotor, spherical rotor and asymmetric rotor molecules

(2) The first three Stokes lines in the rotational Raman spectrum of $^{16}O_2$ are separated by 14.4 cm^{-1}, 25.8 cm^{-1} and 37.4 cm^{-1} from the exciting radiation. Using the rigid rotor approximation obtain a value for r_0.

(3) Write a note on isotopic effect in rotational spectra.

(4) Describe stark effect in diatomic, linear and symmetric rotor molecules.

4 Answer any two of the following 18

(1) Write a note on factor influence NMR chemical shift.

(2) Write a note on ^{19}F and ^{31}P NMR spectroscopy.

(3) What is first and second order spectra? Explain splitting patterns in ABX and AMX spin system.

(4) Write importance of FT-NMR and give application of FT-NMR in medical diagnostics.

JCV-2525-2526 Seat No._____

M. Sc. (Sem. II) Examination

June – 2022

Chemistry

(1) Organ Transition Metal Chemistry : CHNN-505(A)

(Elective Course)

(2) Bionorganic & Supramolecular Chemistry : CHNN-505(B)

(Elective Course)

Time : $1\frac{1}{2}$ Hours] [Total Marks : 35

(1) Organ Transition Metal Chemistry : CHNN-505(A)

(Elective Course)

Instruction : All questions are compulsory.

1 Answer any two : 18

(1) Discuss classification and types of organotransition metal compound.

(2) Write a note on homogeneous catalytic hydrogenation.

(3) Write a note on organo copper additions reactions.

2 Answer any two : 17

(1) Write a note on metal carbene and metal carbyne complexes.

(2) Explain transition metals compounds with bonds to hydrogen.

(3) Write a note on organo copper reagent.

3 Answer any two of the following 17

(1) Explain Linear, symmetric rotor, spherical rotor and asymmetric rotor molecules

(2) The first three Stokes lines in the rotational Raman spectrum of $^{16}O_2$ are separated by 14.4 cm^{-1}, 25.8 cm^{-1} and 37.4 cm^{-1} from the exciting radiation. Using the rigid rotor approximation obtain a value for r_0.

(3) Write a note on isotopic effect in rotational spectra.

(4) Describe stark effect in diatomic, linear and symmetric rotor molecules.

4 Answer any two of the following 18

(1) Write a note on factor influence NMR chemical shift.

(2) Write a note on ^{19}F and ^{31}P NMR spectroscopy.

(3) What is first and second order spectra? Explain splitting patterns in ABX and AMX spin system.

(4) Write importance of FT-NMR and give application of FT-NMR in medical diagnostics.

JCV-2527 Seat No. 232

M. Sc. (Sem. II) Examination

June - 2022

BOC-201 : Botany

(Biology and Diversity-II Bryophytes and Pteridophytes)

(New Course)

Time : Hours] [Total Marks : 70

Instructions : (1) This question paper consists total four questions.

(2) All.. questions are compulsory and caring 18, 17,18 and 17 marks respectively.

(3) There is no overall choice. However, an internal choice has been provided in each sub-questions.

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

1 Answer the following as per instruction : 18

(A) Explain in Detail - any one.. 8

(1) Describe :Vegetative propagation in Bryophytes

(2) Write in short :Algal origin of Bryophytes

(B) Explain in Brief - any one. 7

(1) Explain in short : Origin of Bryophytes From Ptridophytes.

(2) Write in short :Economic importance of Bryophytes.

(C) Give short answers - any three. 3

(1) Which phase is dominant in Bryophytes

(2) In liverworts, the rhizoids are ____ cellular.

(3) First land inhabiting plants are ____

(4) In Bryophytes sporemother cells are ____ in nature.

(5) Bryology is the study of ____

2 Answer the following as per Instruction:

(A) Explain in Detail - any one.

(1) Describe the theory of 'Progressive sterilization' of the potentially sporogenous tissue in Bryophytes

(2) Write the structure of mature sporophyte of Polytrichum

(B) Explain in Brief - any one. 4

(1) Describe in detail : Mature Sporophyte of Anthoceros.

(2) Explain in short: Sexual reproductive organ in Riccia.

(C) Give short answers - any three. 3

(1) Intercalary meristematic tissue occurs in the sporophyte of ____

(2) Air gun mechanism of capsule dehiscence occurs in ____

(3) Sphagnum commonly known as ____

(4) Psudoelaters are found in ____

(5) Name the central-sterile, tissue found in certain capsules of Bryophytes.

3 Answer the following as per Instruction: 18

(A) Explain in Detail - any one. 8

(1) Telome theory

(2) Apospory

(B) Explain in Brief - any one. 7

(1) Economic importance of Pteridophytes.

(2) Explain Heterospory with the help of sellaginela

(C) Give short answers - any three. 3

(1) Who proposed Telome theory?

(2) _____ is the vascular cryptogams.

(3) Seed habit,considered an impotant step in evolution, is present in _____.

(4) Apogamy results in the formation of _____ embryo.

(5) Apospory was first demonstrated by _____

4 Answer the following as per Instruction : 17

(A) Explain in Detail - any one. 8

(1) Descibe the protostele and its types

(2) Lycopodium cone

(B) Explain in Brief - any one. 6

(1) Marsilea sporocarp

(2) Write the internal structure of Psilotum sem with labeled diagram

(C) Give short answers - any three. 3

(1) Name the spore producing organs in Psilotum

(2) Quillwort is the common name of _____

(3) What is ligule?

(4) The spore producing bodies of Marsilea are called _____

(5) _____ is the non-medullated stele.

Inter Ac Pi Mix with Pith

JCV-2528

Seat No. _____

M. Sc. (Sem. II) Examination

June - 2022

BOC-202 : Botany

(Plant Antomy and Reproduction)

(New Course)

Time : 2.30 Hours] [Total Marks : 70

Instructions : (1) This question paper consists total four questions.

(2) All questions are compulsory and caring 18, 17, 18 and 17 marks respectively.

(3) There is no overall choice. However, an internal choice has been provided in each sub-questions.

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

1 Answer the following as per Instruction: 18

(A) Explain in Detail - any one. 8

(1) Histogen theory of shoot apical meristem

(2) Heart wood and Sap wood

(B) Explain in Brief - any one. 7

(1) Korper-Kappe theory.

(2) Xylem elements

(C) Give short answers - any three.

(1) Companion cells are present alongside the ____.

(2) Who proposed quiescent centre concept?

(3) Tunica corpus theory is connected with ____.

(4) The term meristem was given by ____

(5) Which region in heartwood is light in colour?

2 Answer the following as per Instruction:

(A) Explain in Detail - any one.

(1) Explain the secondary growth in Mirabilis stem

(2) Cambium in monocotyledons

(B) Explain in Brief - any one.

(1) Write in short: Nodal Anatomy

(2) Write the structural variability of Aloe and Maize leves.

(C) Give short answers - any three.

(1) Growth that increase the girth and thickness of plants is called ____.

(2) Cork cambium is also called ____.

(3) Inter fascicular cambium is a ____

(4) Wound healing in plants is initiated by ____.

(5) Which tissue provides maximum mechanical strength to the plant.

3 Answer the following as per Instruction: 18

(A) Explain in Detail - any one. 8

(1) Write the structure of mature anther wall

(2) Formation of vegetative and generative cell

(B) Explain in Brief - any one. 7

(1) Types of ovule

(2) Preparation of pollen grain

(C) Give short answers - any three. 3

(1) Exine is made up of Sporopollenine

(2) Generative nucleus divided forming _____. Microgametophyte

(3) Germ pore is an area where exine is _____.

(4) A microspore mother cell divided meiotically and forms ____.

(5) Stalk of ovule is called _____.

4 Answer the following as per Instruction : 17

(A) Explain in Detail - any one. 8

(1) Tetra sporic types of embryo sac development

(2) In vitro pollen germination

(B) Explain in Brief - any one. 6

(1) Polyembryony

(2) Crusifer type of embryo development

(C) Give short answers - any three.

(1) Define : Double fertilization

(2) Milky water of green coconut is _____.

(3) Write the role of Boron on in vitro pollen germination.

(4) What is the function of the filiform apparatus ?

(5) The female gametophyte is also known as _____.

JCV-2529 Seat No. _____

M. Sc. (Sem. II) Examination

June - 2022

Botany : BOC - 203

(Biochemistry, Biophysics & Instrumentation)

(New Course)

Time : 2:30 Hours] [Total Marks : 70

1 (a) Answer the following: Long answer question: 8

(**one** out of two)

(1) Write note on structure and function of Polysaccharides.

(2) Describe oxidation of fatty acid.

(b) Answer the following: Short notes: 7

(**one** out of two)

(1) Give the properties and classification of amino acids.

(2) Write note on chemical bonds.

(c) Answer the following: Short question: 3

(**three** out of five)

(1) What is isomerism?

(2) Name two disaccharides. Glucose | Fructose

(3) Give the example of two hexose sugar.

(4) What is Phospholipid?

(5) Name the sulfur containing amino acids.

JCV-2529 Seat No._____

M. Sc. (Sem. II) Examination

June - 2022

Botany : BOC - 203

(Biochemistry, Biophysics & Instrumentation)

(New Course)

Time : 2:30 Hours] [Total Marks : 70

1 (a) Answer the following: Long answer question: 8

(**one** out of two)

(1) Write note on structure and function of Polysaccharides.

(2) Describe oxidation of fatty acid.

(b) Answer the following: Short notes: 7

(**one** out of two)

(1) Give the properties and classification of amino acids.

(2) Write note on chemical bonds.

(c) Answer the following: Short question: 3

(**three** out of five)

(1) What is isomerism?

(2) Name two disaccharides. Glucose / Fructose

(3) Give the example of two hexose sugar.

(4) What is Phospholipid?

(5) Name the sulfur containing amino acids.

2 (a) Answer the following: Long answer question:
(**one** out of two)

(1) Write the classification and structure of protein.

(2) Write note on structure and function of various water soluble vitamins.

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

(1) Give the various type of enzyme inhibitors.

(2) Write note on Ramachandran plot.

(c) Answer the following: Short question: 3
(**three** out of five)

(1) What is coenzyme?

(2) Name the two fat soluble vitamin.

(3) Give the cause of beriberi disease.

(4) What is protein denaturation?

(5) What are hydrolytic enzymes?

3 (a) Answer the following: Long answer question: 8
(**one** out of two)

(1) Write notes on pH and buffers.

(2) Explain the laws of thermodynamics.

(b) Answer the following: Short notes: 7
(**one** out of two)

(1) Give application of radians in plant science.

(2) Describe redox potential.

(c) Answer the following: Short question: 3

(**three** out of five)

(1) What are free radicals?

(2) What is isotope?

(3) Define Charge Transfer Complex (CTC).

(4) Give the range of alkaline pH.

(5) What is Entropy and Enthalpy?

4 (a) Answer the following: Long answer question: 8

(**one** out of two)

(1) Describe the principle and application of Thin layer chromatography.

(2) Write note on Agarose gel electrophoresis.

(b) Answer the following: Short notes: 6

(**one** out of two)

(1) Describe the principle and application of Spectrophotometry.

(2) Write note on UV-visible spectroscopy.

(c) Answer the following: Objective type question: 3

(**three** out of five)

(1) Give the full form of NMR.

(2) What is optical density?

(3) Give the full form of HPTLC.

(4) Define chromatography.

(5) What is Beer Lambert laws?

JCV-2530

Seat No. _____

M. Sc. (Sem. II) Examination

June – 2022

Botany : BOC 204

(Research Methodology, Bio Statistics, IPR & Biosafty)

(New Course)

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

SECTION I

1 (a) Answer the following – Long answer questions : (one out of two) 8

(1) Write note on various characteristics and types of scientific research.

(2) Explain the various methods of data collection.

(b) Answer the following – Short notes (One out of two) 7

(1) Write note on research and experimental design.

(2) Explain the basics of research methodology.

(c) Answer the following – Short Question : (three out of five) 3

(1) Enlist features of good research design.

(2) What is scientific research ?

(3) Define : Research methodology.

(4) Give two uses of applied research.

(5) Define : True experimental design.

Exc perimen + descriptive Historical Summative

2 (a) Answer the following – Long answer question (one out of two) 8

(1) Write a note on layout of writing research thesis.

(2) Describe briefly presentation of scientific research.

(b) Answer the following – Short notes (one out of two) 6

(1) Write note on selection criteria of scientific journals for research publication.

(2) Write note on preparation of research proposal.

(c) Answer the following – Short question (three out of five) 3

(1) What is impact factor ?

(2) How to calculate H index ?

(3) What is bibliography ?

(4) What is scientific abbreviations ?

(5) Define : Abstract of Research paper

3 (a) Answer the following – Long answer question (one out of two) 8

(1) Write about any one parametric test with example

(2) Explain significance of chi-square with example.

(b) Answer the following – Short notes (one out of two) 7

(1) Explain binomial distribution with example.

(2) Describe simple linear regression citing suitable example

(c) Answer the following – (short question : (Three out of five) 3

(1) What is biometry ?

(2) Enlist different types of student t test.

(3) Enlist few non parametric tests.

(4) What is the use of rank test in statistics ?

(5) Write formula of standard deviation and standard error.

4 (a) Answer the following – Long answer question : (one out of two) 8

(1) Write brief note on Intellectual Property Rights (IPR).

(2) Describe the various level of biosafety.

(b) Answer the following - Short notes : (One out of two) 6

(1) Discuss about the various types of patents.

(2) Describe various laboratory associate infection and hazards needed to control.

(c) Answer the following – Objective type question : (Three out of five) 3

(1) What is trademark ?

(2) How long do patents usually last for ?

(3) Give full form of WIPO and EPO.

(4) What is Tangible properties ?

(5) Name two biological hazards found in hospitals.

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