Unique Paper Code: 42231102

Name of the paper: Animal Diversity

Name of the course: B.Sc (P) Life Sciences

Semester: I LOCF

Duration: 3 hours

Maximum Marks: 75 Marks

Instructions for candidates:

(a) Attempt any 4 questions. All questions carry equal marks.
(b) Draw well labelled diagrams wherever necessary.

SET A

1.Describe the life cycle of *Taenia solium* with well labelled diagrams. Explain the reasons for its successful parasitic mode of life? 18.75

2. The life cycle of insects is quite complex and generally consists of several stages. Explain the variations of the process by which the young one hatching out from the egg transforms into adult in different groups of insects. Add a note on the endocrine control of this process. 18.75

3.Describe the various types of locomotory organelles of Protists and explain their role in locomotion. 18.75

4.Give the salient features of Class Amphibia. What do you understand by the term Parental care? Describe the parental care and its significance in amphibians with suitable examples. 18.75

5. Migration is one of the most amazing events in the life of many species of animals. Describe the process of migration of birds in details. 18.75

6. Elaborate the mechanism of maintaining the internal balance of salt and water in various groups of fishes that help them to adapt to their habitats. 18.75

Mode of Examination: Open Book Examination

Unique Paper Code : 42234301

Name of the Paper : Physiology and Biochemistry

Name of the Course : **B.Sc. (P) Life Science Zoology Examination, 2021-LOCF**

Semester : Semester- III, Theory Examination

Duration : 3 hours

Maximum Marks : 75 Marks

**Instruction for Candidates**

1. Write your Roll No., Name of the paper, Course, Semester, UPC and Date of examination on the first page of answer sheet.
2. Attempt **ANY FOUR** questions in all, **TWO** each from Section A and Section B.
3. Use separate sheet for **Section A** and **Section B**.
4. All questions carry equal marks.
5. Draw well labelled diagrams wherever required.

## SECTION A

Q1. Define pacemaker. Write in detail the origin, conduction and regulation of heartbeat. Describe the various events associated with the Cardiac cycle. (18.75)

Q2. Explain the detailed structure of pituitary gland. Give the names and functions of hormones secreted by it. Discuss the hormonal control of the menstrual cycle. (18.75)

Q3. Describe the mechanism of dilute urine formation in kidney nephron. Add a note on hormones of adrenal gland. (18.75)

## SECTION B

Q4. Describe the various steps involved in oxidation of fatty acids. Discuss in brief components of Electron Transport Chain. (18.75)

Q5. What is an enzyme? Explain the action of enzymes with special reference to induced fit theory. Derive the Michaelis Menten equation for single enzyme single substrate reaction. (18.75)

Q6. Give an account of Citric Acid Cycle. Explain the process of glycogenolysis. How is it regulated? (18.75)

**SET I**

**B.Sc. Life Sciences / Semester III/ 2021**

**Paper Title: Plant Anatomy and Embryology**

**Unique Paper Code: 42164301_OC**

**Time: 3 + 1 Hours** **Maximum Marks: 75**

**(Write your University Roll Number, Paper Title and Unique Paper Code on top of the Answer Sheet)**

**Attempt any four questions in all. All questions carry equal marks (i.e., 18.75)**

Q.1. What do you understand by the cambial zone? Elucidate the reason behind the seasonal activity of cambium with the help of suitable diagrams.

Q.2. What is double fertilization? Describe the development of the two products of double fertilization during the formation of a dicotyledonous seed.

Q.3. What is meristem? Give a brief account of the organization of root and shoot apical meristems in plants. Draw diagrams to support the same.

Q.4. What is cross-pollination? Discuss its significance and list out the different mechanisms of cross pollination. Also bring out the similarities and dissimilarities in hydrophily and anemophily.

Q.5. Explain the different anatomical changes adapted by some plants to be able to grow in extreme scarcity of water in arid zones with the help of examples (two) and suitable diagrams.

Q.6.What are the different types of embryo sacs present in angiosperms? Explain in detail the development of Polygonum type of embryo sac with suitable diagram.

**Unique Paper Code** : 42174304_OC

**Name of the Paper** : Solutions, Phase Equilibrium, Conductance, Electrochemistry& Functional Group Organic Chemistry-II

**Name of the Course** : B.Sc (Prog) Life Sciences /Physical Sciences

**Semester** : III

**Duration** : 3 hours

**Maximum Marks** : 75

## Instructions for Candidates:

i. Following details must be written on first page:
• University Roll No.:
• Unique Paper Code:
• Class:
• Course:
• Semester:
• Paper Name:
ii. Put page numbers on every page of the answer script.
iii. **Attempt and upload Section A and B separately.**
iv. Attempt **two** questions from **each** section and **four** questions in all.
iv. Marks are mentioned at the end of each question.
v. Attempt all parts of a question together.

### Section A: Physical Chemistry

*Attempt any **two** questions.*

1. (a) A pair of partially miscible liquids shows upper CST if, an impurity which is soluble in both is added, the upper CST is .....while an impurity which is soluble in one of the liquids, upper CST ..... . **(0.75)**

(b) Explain, what do you understand by an ideal solution. Show that for an ideal solution $\Delta_{mix}H = 0$ and $\Delta_{mix}V = 0$, where $\Delta_{mix}H$ and $\Delta_{mix}V$ are the changes in enthalpy and volume on mixing various constituents of the liquid solution. Suggest a possible reason for $\Delta_{mix}H$ and $\Delta_{mix}V$ being equal to zero. **(6)**

(c) (i) Explain the Lever Rule.

(ii) What are azeotropic mixtures? Is it possible to separate the components of an azeotropic system using distillation? Explain. **(6)**

(d) A solute X is distributed between two immiscible liquids B and C with the value of the distribution coefficient, $[X]_C/[X]_B$, equal to 10. The concentration units are expressed in terms of grams of solute per $dm^3$ of solvent. It is desired to remove 99% of the amount of X from a solution containing 1 g of X in 100 $cm^3$ of B by extraction with successive 10 $cm^3$ portions of solvent C. Calculate the approximate volume of solvent C **(6)**

required for this purpose.

2. (a) What does '2' represent in the Gibbs phase rule, F=C-P+2? **(0.75)**

(b) (i) KCl-NaCl-$H_2O$ is a three component system whereas KCl-NaBr-$H_2O$ is a four component system. Explain.

(ii) In the phase diagram of water, the slope of the fusion curve is negative. Explain. **(6)**

(c) Draw the phase diagram of $FeCl_3$-$H_2O$ system and discuss its salient features. **(6)**

(d) (i) Draw the conductometric titration curve of a weak acid against a strong base and explain the nature of the plot.

(ii) The molar conductances at infinite dilution for sodium acetate and hydrogen chloride at 30°C are $91.0 \times 10^{-4}$ and $426.16 \times 10^{-4}$ S $m^2$ $mol^{-1}$, respectively. Also for $H^+$ ion in HCl, $t_+$ is 0.821 and for $CH_3COO^-$ ion in $CH_3COONa$, $t_-$ is 0.556. Assuming that, $t_\pm = t_\pm^0$, calculate $\Lambda_M^0$ for $CH_3COOH$. **(6)**

3. (a) Which one is preferred to make a salt bridge: KCl or $KNO_3$? **(0.75)**

(b) (i) Why does conductivity of an electrolyte solution decrease with dilution while molar conductivity increases?

(ii) How is ionic velocity different from ionic mobility? **(6)**

(c) (i) Write down the principles underlying potentiometric titration. What are the advantages of potentiometric titration?

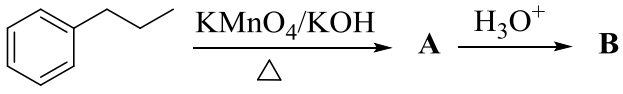
(ii) What is the role of salt bridge in an electrochemical cell? **(4,2)**

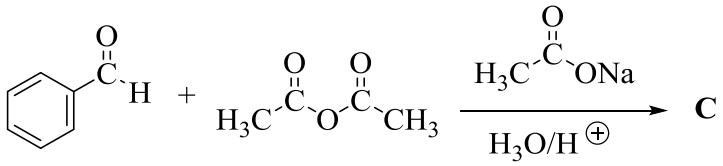
(d) The EMF of the Standard Weston cell written as
$Cd(Hg), CdSO_4.8/3H_2O(s)| | CdSO_4(sat.), Hg_2SO_4$ (s), Hg
in which the cell reaction is
$Cd(Hg) + Hg_2SO_4(s) + 8/3H_2O(l) \leftrightarrow CdSO_4.8/3H_2O(s) + 2Hg(l)$
is 1.0185 V at 25°C. Calculate the free energy change $\Delta G°$, enthalpy change $\Delta H°$, entropy change $\Delta S°$ for the cell reaction at 25°C if the temperature coefficient of EMF of the cell is $5.00 \times 10^{-5}$ V $K^{-1}$. Given that F= 96485 C $mol^{-1}$. **(6)**

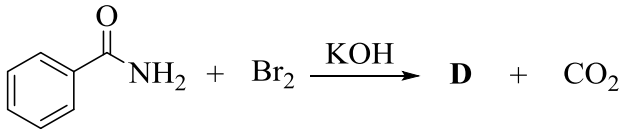
## Section B: Organic Chemistry

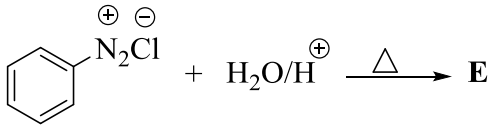
*Attempt any **two** questions.*

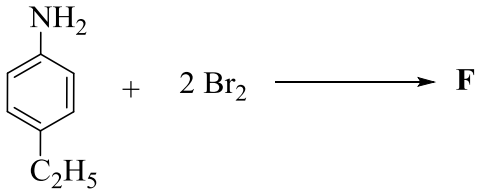
4. (a) Predict the structure of products (A-F) in the following reactions:











(b) Explain the following name reactions with suitable examples.

(i) Hell-Volhard-Zelinsky reaction.

(ii) Schotten-Baumann reaction.

(c) How will you synthesize the followings?

(i) Acetic acid using acidic hydrolysis of ethyl acetate.

(ii) Glycine using Streker's synthesis.

(d) Write the reaction involve for the conversion of an acid chloride to an amide.

**(6, 6, 5, 1.75)**

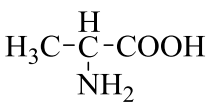
5. (a) Write short notes on:

i. Carbylamine test

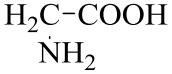
ii. Zwitter ion

iii. Claisen condensation reaction.

(b) Deabbreviate: *t-BOC* and *DCC*. Using these, write all the steps involve for the synthesis of ala-gly dipeptide.



Alanine



Glycine

(c) How will you separate Arginine, Alanine and Aspartate by electrophoresis technique?

(Isoelectric points for Arginine, Alanine and Aspartate are 10.76, 6.02, and 2.98, respectively).

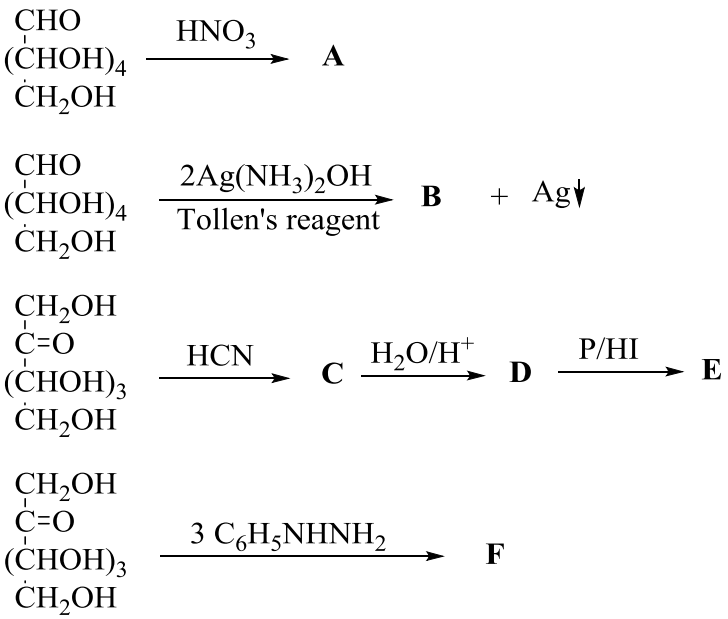
(d) Draw the structure of Edman's reagent. Write the PTH-amino acid structure formed, when it applies on the following structure.

ala-gly-his-val-asp

(e) Draw the structure of violet/purple coloured complex which is obtained by glycine with ninhydrin.

**(6, 6, 4, 1.75, 1)**

6. (a) Write the structure of the products (A-F) of the following reactions:




(b) How will you convert D-arabinose to D-glucose and D-mannose by Killiani-fisher synthesis?

(c) What does it mean by mutarotation. Explain by taking D-glucose as an example.

(d) Draw the following structures:

(i) α-D-Glucose and β-D-Glucose (Haworth projection)

(ii) α-D-Fructopyranose and β-D- Fructopyranose (Haworth projection)

(e) Maltose is reducing sugar while sucrose is not. Why?

**(6, 4, 2, 4, 2.75)**

**SET I**

**B.Sc. Life Sciences / Semester III/ 2021**

**Paper Title: Plant Anatomy and Embryology**

**Unique Paper Code: 42164301_OC**

**Time: 3 + 1 Hours** **Maximum Marks: 75**

**(Write your University Roll Number, Paper Title and Unique Paper Code on top of the Answer Sheet)**

**Attempt any four questions in all. All questions carry equal marks (i.e., 18.75)**

Q.1. What do you understand by the cambial zone? Elucidate the reason behind the seasonal activity of cambium with the help of suitable diagrams.

Q.2. What is double fertilization? Describe the development of the two products of double fertilization during the formation of a dicotyledonous seed.

Q.3. What is meristem? Give a brief account of the organization of root and shoot apical meristems in plants. Draw diagrams to support the same.

Q.4. What is cross-pollination? Discuss its significance and list out the different mechanisms of cross pollination. Also bring out the similarities and dissimilarities in hydrophily and anemophily.

Q.5. Explain the different anatomical changes adapted by some plants to be able to grow in extreme scarcity of water in arid zones with the help of examples (two) and suitable diagrams.

Q.6.What are the different types of embryo sacs present in angiosperms? Explain in detail the development of Polygonum type of embryo sac with suitable diagram.

| | | |
|---|---|---|
| **Unique Paper code** | **:** | **42167902** |
| **Name of the paper** | **:** | **Cell and Molecular Biology** |
| **Name of the Course** | **:** | **B.Sc. Life Sciences** |
| **Semester** | **:** | **V** |

**Duration :** 4 Hours (three hours for answering and one hour for downloading of question paper and uploading the PDF of scanned answer sheets as one file)

**Maximum Marks: 75**

**Guidelines to attempt the Question paper**

1. Attempt any **Four** Questions.
2. Attempt the Question paper on Numbered A- 4 size sheets.
3. Mention Roll number, Date, UPC and Examination on the top of answer sheet.

1. Differentiate between Light microscopy, Electron microscopy and Fluorescent microscopy with suitable diagrams. (18.75)

2. Write short notes on any ***Three***: (18.75)

   a) Genetic code

   b) Hershey & Chase Experiment

   c) Various phases of cell cycle & its significance

   d) Functions of Golgi apparatus

   e) Nucleosome

3. a) Draw the well labelled Diagram of Chloroplast and justify the statement that chloroplast is semiautonomous organelle. (12.75)

   b) Explain Freeze fracture technique. (6.00)

4. a) Explain Lac operon model in detail with reference to positive and negative control of gene regulation. (14.75v)

   b) Draw the well labelled structure of Lampbrush chromosome. (4.00)

5 a) Mention differences in DNA Replication process of Prokaryotes and Eukaryotes. (12.75)

   b) Explain Theta mode of replication. (6.00)

6. a) Discuss about Transcription in Prokaryotes with suitable diagram. (12.00)

   b) Draw well labelled diagram of Prokaryotic and Eukaryotic cell. (6.75)

   or

   Discuss about any one model of cell membrane studied by you with the help of suitable diagrams and mention the function of it. (6.75)

**SET A**

Unique Paper Code : 42177925_OC

Name of the Paper : Chemistry of d-block elements, Quantum Chemistry & Spectroscopy

Name of the Course : B.Sc.( Prog.) Life Sciences/Physical Sciences

Semester : V

Duration : 3 hours

Maximum Marks : 75

**Instruction for Candidates**

Following details to be written on first page:

University. Roll. No.
Name:
Class:
Course:
Semester:
Paper Name:
Unique paper code:

1. Put page numbers on every page of the answer script.
2. Attempt ***ANY TWO*** questions from each section.
3. Each Question carries equal marks.
4. First part of each question carries 6.75 marks.
5. Remaining parts of each question carry 6 marks.
6. Attempt all parts of a question together.

**SECTION-A**

Q1.

(a) (i) The complex ion $[CoCl_6]^{3-}$ has a maximum in absorption of visible light at 363 nm. What is the value of CFS for this complex ion, expressed in $cm^{-1}$.

(ii) Give all possible geometrical and optical isomers of: $[Co(en)Cl_2Br_2]^-$, $[Co(NH_3)_2BrCl]^+$, and $[Pt(NH_3)_2(NO_2)_2]$. If optically active, give reasons to account for it.

(b) (i) Explain why knowledge of magnetic moment is often necessary for a correct assignment of the electron configuration and geometry according to the Valence bond theory.

(ii) $K_4[Cr(NCS)_6]$ has a magnetic moment of 5.0 B. M. while $K_4[Cr(CN)_6]$ has a value of only 3.2 B.M. Using the valence bond treatment for both the complexes, (i)) assign

the electronic configuration to the central metal ion, (ii) predict the type of hybridization involved, and (iii) explain the geometry.

(c) (i) Arrange the following complex ions in the order of increasing $\Delta_0$ giving reasons:

$[Co(NH_3)_6]^{3+}$, $[CoF_6]^{4-}$, $[Rh(NH_3)_6]^{3+}$ and $[CoF_6]^{3-}$

(ii) What is CFS? In a square planar complex, the CFS of the d-orbital energies of a central ion decrease in the sequence: $d_{x2-y2} > d_{xy} > d_{z2} > d_{xz}, d_{yz}$. Offer an explanation for the decreasing trend in energies.

Q2.

(a) Construct the Latimer diagram for iron in acidic medium. Given the standard reduction potentials in volts at 25°C as follows:

$FeO_4^{2-} + 3e^- \rightarrow Fe^{3+}$ $\quad E°_{red} = 2.20$ V
$Fe^{3+} + e^- \rightarrow Fe^{2+}$ $\quad E°_{red} = 0.77$ V
$Fe^{2+} + 2e^- \rightarrow Fe_{(s)}$ $\quad E°_{red} = -0.47$ V

Based on the Latimer diagram answer the following:

(i) Is there any tendency of $Fe^{2+}$ to reduce to Fe? Give reasons.
(ii) Is there any state which undergoes disproportionation? Explain
(iii) Calculate skip step emf for $Fe^{3+} \rightarrow Fe$ change.
(iv) Which is the most stable species and which is the most oxidizing species? Give reasons for your choice.

(b) (i) Define Jahn-Teller theorem. (ii) Octahedral Complexes are found to possess distorted structures due to Jahn-Teller Distortions. Rank the following compounds in terms of their degree of distortion from regular octahedral structure. (iii) Explain your reasoning with the help of crystal field splitting diagram.

$[Mn(CN)_6]^{3-}$, $[Co(NH_3)_6]^{3+}$, and $[Cu(OH_2)_6]^{2+}$

(c) For the $Mn^{3+}$, the electron-pairing energy, P, is about 335 kJ $mol^{-1}$. Approximate values of CFS, $\Delta_0$ for the complexes $[Mn(H_2O)_6]^{3+}$ and $[Mn(CN)_6]^{3-}$ are 250 kJ $mol^{-1}$ and 460 kJ $mol^{-1}$ respectively. Calculate the crystal field stabilization energy (CFSE) for both high-spin and low-spin states and predict if these complexes have high-spin or low-spin configurations? Give the electron compositions of the $t_{2g}$ and $e_g$ levels for the observed spin states.

Q3. Answer ***ANY THREE*** of the following:

(a) Transition elements (3d series) show variable oxidation states. Explain giving reasons. Which of the following will show greater number of oxidation states: Cr or Mn and why?

(b) Discuss the magnetic behaviour in Lanthanides and actinides as compared to transition elements. Among the lanthanide ions the magnetic moment of only $Gd^{3+}$ is in agreement with the moment calculated from spin only formula. Explain?

(c) Actinides have a greater tendency to form complexes than lanthanides.

(d) How does CFT account for preference for octahedral geometry? Why do metal ions with $d^3$ and $d^8$ ions prefer octahedral geometry?

(e) Transition elements and their compounds are good catalysts. Explain giving reasons.

## SECTION-B

Q4.

(a) What important aspect is signified by the property of commutation? Find whether the operators A = $\frac{d}{dx}$ and B = x commute with each other.

(b) Show that $\psi = 3\cos 2x$ is an eigenfunction of the operator:

$$\frac{-h^2}{4\pi^2}\frac{d^2}{dx^2}$$

What is the eigenvalue?

(c) For a particle of mass m in a 1-D box of length l, show that $\Psi_n$ forms an orthonormal set of wavefunctions.

Q5.

(a) What are the selection rules for a molecule to show rotational and vibrational spectra. Which of the following molecules will give rise to observable rotational and vibrational spectra CO, $O_2$, HBr.

(b) Write the properties of an acceptable wavefunction. State which of the following wavefunctions are acceptable over the range:

x = 0 to $2\pi$ .

(i) tan(x) (ii) cosec(x) (iii) cos (x) + sin(x)

(c) Write the formula for the reduced mass of a diatomic molecule. For HCl molecule calculate energy of the rotational state with J = 1. ($m_H$ = 1.673 x $10^{-27}$ kg, $m_{Cl}$ = 58.06 x $10^{-27}$ kg and equilibrium distance, r = 121.25 pm)

Q6.

(a) Define and explain the term 'Quantum Efficiency'. Justify the statement that the quantum efficiency of a primary process is always one.

(b) Explain the process of Fluorescence and Phosphorescence with appropriate diagram.

(c) Write short note on the following:

(i) Auxochrome
(ii) Frank-Condon principle
(iii) Photoelectric cell

**Set B**

**Unique Paper Code:** 42163512
**Name of the Course:** B.Sc. Life Sciences (CBCS)
**Name of the Paper:** Ethnobotany (SEC-III)
**Semester:** V

**Time: 2+ 1 Hours** **Maximum Marks: 38**

(Write Date of exam, Examination Roll Number, Name of Course, Semester, Unique paper code, Paper Title, College Name, your Email ID and Phone number on first page of the Answer Sheet. Answer on A4 size sheets and mark page number on top of each sheet.)

***Attempt any four questions in total. All question carry equal marks***.

1. 'Ethnobotany is considered as a multidisciplinary science', Comment. Describe lifestyle of any one major and one minor tribe of India. (9.5)

2. Discuss the importance of temples and sacred places in expanding ethnobotanical knowledge. Give suitable examples. (9.5)

3. Give scientific name, family, brief morphological description and the ethnobotanical importance of (a) Neem, (b) Nirgundi, & (c) Gokshur. (9.5)

4. Describe the endangered taxa in detail with reference to India. Do you think tribal practices help in protection and conservation of forests and endangered taxa? Justify your answer with evidences from India. (9.5)

5. Misappropriation of Traditional Knowledge is a great loss for a nation. Elaborate using three cases from India. Briefly explain the mechanisms adopted by India to prevent this. (9.5)

6. Illustrate the connection between Traditional Medicine and Modern Medicine by giving detailed account of the phytochemical profile and medicinal properties of Sarpagandha and Ashwagandha. (9.5)

SET A

Unique paper code :42163302
Name of the course : BSc Life Science
Name of the paper. : Biofertilizer (SEC)
Semester : III
Duration : 3 Hours+1 Hours for uploading **Maximum marks: 38**

**Instructions for candidate**

a) Write your Roll No., Name of the Paper, Course, Semester and Date of examination on the first page of the answer sheet.

b) Attempt **ANY FOUR** questions. All questions carry equal marks.

1. What are the different types of mycorrhizal associatons? Discuss the role of abuscular mycorrhizae in increasing the crop productivity. (9.5)

2.Why *Rhizobium* is a known as a wonder fertilizer? Discuss its production technology for field applications. (9.5)

3. What is a biofertilizer? Explain various sources of Biofertilizers with examples. (9.5)

4. What is the role of *Azolla* and Blue Green Algae in Rice cultivation? Mention various advantages of using Blue Green Algae as a biofertilizer. (9.5)

5. Define compost and mention its various sources. How is vermicomposting better than other methods of composting? (9.5)

6. Organic farming is a unique production management system which promotes and enhances agro-ecosystem health. Justify your answer. Discuss principle and advantages of the organic farming. (9.5)

**SET A**

Unique paper code :42163302

Name of the course : B.Sc Life Science

Name of the paper : Biofertilizer (SEC)

Semester : III

Duration : 3 Hours+1 Hours for uploading **Maximum marks: 38**

**Instructions for candidate**

a) Write your Roll No., Name of the Paper, Course, Semester and Date of examination on the first page of the answer sheet.

b) Attempt **ANY FOUR** questions. All questions carry equal marks.

1- "Organic farming- The need of the hour". Justify given statement. How organic farming is different from conventional farming. Discuss its advantages and limitations. (9.5)

2- 'Mutualistic associations are a subset of symbiosis where two or more different living organisms receive mutual benefits'. Explain given statement with mycorrhizal association and its benefits in agriculture. Differentiate between ectomycorrhiza and endomycorrhiza. (9.5)

3- Bio-fertilizers are formulations of beneficial microorganisms that help the growth of plants by increasing the quantity and availability of nutrients through their biological activities. Justify your answer with *Azolla- Anabaena* association and its application in Rice cultivation. (9.5)

4- Inappropriate or excess application of chemical N fertilizers causes environmental problems, such as contamination of ground water by nitrates, and air pollution and global warming due to nitrous oxide. Explain how *Rhizobium* as biofertilizer play an important role in sustainable agriculture. Give isolation and inoculation method of *Rhizobium*. (9.5)

5- Elaborate the statement "Earthworms are organic waste managers" and discuss the technique for forming biofertilizer using earthworms. Give advantages and limitations for same. (9.5)

6- What are different types of Biofertilizers? Explain method used for isolation and mass multiplication of *Azospirillum*. (9.5)

**Set B**

**Unique Paper Code:** 42163512
**Name of the Course:** B.Sc. Life Sciences (CBCS)
**Name of the Paper:** Ethnobotany (SEC-III)
**Semester:** V

**Time: 2+ 1 Hours** **Maximum Marks: 38**

(Write Date of exam, Examination Roll Number, Name of Course, Semester, Unique paper code, Paper Title, College Name, your Email ID and Phone number on first page of the Answer Sheet. Answer on A4 size sheets and mark page number on top of each sheet.)

***Attempt any four questions in total. All question carry equal marks***.

1. 'Ethnobotany is considered as a multidisciplinary science', Comment. Describe lifestyle of any one major and one minor tribe of India. (9.5)

2. Discuss the importance of temples and sacred places in expanding ethnobotanical knowledge. Give suitable examples. (9.5)

3. Give scientific name, family, brief morphological description and the ethnobotanical importance of (a) Neem, (b) Nirgundi, & (c) Gokshur. (9.5)

4. Describe the endangered taxa in detail with reference to India. Do you think tribal practices help in protection and conservation of forests and endangered taxa? Justify your answer with evidences from India. (9.5)

5. Misappropriation of Traditional Knowledge is a great loss for a nation. Elaborate using three cases from India. Briefly explain the mechanisms adopted by India to prevent this. (9.5)

6. Illustrate the connection between Traditional Medicine and Modern Medicine by giving detailed account of the phytochemical profile and medicinal properties of Sarpagandha and Ashwagandha. (9.5)

## Mode of Examination: Open Book Examination

**SET- 2**

| | | |
|---|---|---|
| Unique Paper Code | : | 42237903 |
| Name of the Paper | : | DSE: Animal Biotechnology |
| Name of the Course | : | B.Sc. (Prog.) Life Sciences - **LOCF** |
| Semester | : | Semester – V |
| Duration | : | 3 hours |
| Maximum Marks | : | 75 Marks |

**Instructions for Candidates**

- Write your Roll No., Name of the paper, Course, Semester, and Date of examination on the first page of answer sheet.
- Attempt '**ANY FOUR**' **QUESTIONS**. All questions carry equal marks.
- Draw well labeled diagrams wherever necessary.

Q1. Describe the recombinant DNA technology. Enumerate the applications of recombinant DNA technology with suitable examples of each application. 18.75

Q2. Describe the various modification enzymes used in recombinant DNA technology giving example of the chemical reaction catalyzed by each enzyme. Write a short note on Restriction endonuclease enzymes. 18.75

Q3. Describe the use of plasmid pUC 18 and cosmid vectors in gene cloning. Write a short note on expression vectors. 18.75

Q4. Describe the New Generation Sequencing method illumina for DNA sequencing. What advantage it has over the Sanger's method? 18.75

Q5. Give a detailed account on the production of transgenic animals. Write a note on the applications of transgenic animals. 18.75

Q6. Describe the use of Gene therapy for treatment of genetic diseases along with examples each from in-vivo and ex-vivo method. 18.75

# Mode of Examination: Open Book Examination

**SET- 1**

| | | |
|---|---|---|
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- Attempt **'ANY FOUR' QUESTIONS**. All questions carry equal marks.
- Draw well labeled diagrams wherever necessary.

Q1. Define restriction enzymes with examples. Elaborate on the pattern of cleavage, classification and nomenclature of restriction enzymes. Explain how restriction enzymes can be an important tool in biotechnology based on examples on their usage in various techniques for gene manipulation. 18.75

Q2. In order to investigate a blood sample obtained from crime scene the amount of DNA need to be amplified. Which technique would be suitable for this purpose? Explain the principle and steps involved in this technique. Make a well labeled diagram. Write a note on some applications of this technique. 18.75

Q3. What are cloning vectors? Give characteristics of good cloning vectors. Elaborate on role of plasmid cloning vectors in gene cloning. Write a note on vectors used for cloning larger pieces of DNA from eukaryotic cells. 18.75

Q4. Explain the disease caused by mutation in the CFTR gene. Describe the diagnostic procedures for molecular screening of this disease. 18.75

Q5. Describe the methods used for the production of transgenic animals. Write a note on applications of transgenic animals with examples. 18.75

Q6. What is the significance of gene therapy? Write a short note on its types. Enumerate the application of gene therapy with suitable examples. 18.75

**Submitted by:**

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