[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 8561 **HC**

Unique Paper Code : 42163512

Name of the Paper : Ethnobotany

Name of the Course : **B.Sc. Life Sciences : Skill Enhancement Course**

Semester : V

Duration : 3 Hours Maximum Marks : 38

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt **all** questions.
3. All of their parts together.

4. (a) Define the following terms **(any five)** : (1×5=5)

(i) GPS

P.T.O.

(ii) TKDL

(iii) Participatory forest management

(iv) Herbarium

(v) Paleoethnobotany

(vi) Biopiracy

(b) Write suitable answers of the following : (1×5=5

(i) A plant used to cure cancer

(ii) A plant which is used in Alzheimer's disease

(iii) Father of Indian Ethnobotany

(iv) A plant which is associated with Lord Vishnu

(v) A plant which is used as insect-repellent

2. Write botanical name, family, part used a ethnobotanical uses of any **four** : (2×4=

(i) Neem

(ii) Tiger-claw

(iii) Snake-root

(iv) Ashwagandha

(v) True Indigo

(a) Write short note on any **two** : (2.5×2=5)

(i) Major ethnic groups in India

(ii) Gloriosa superba

(iii) Knowledge of ancient literature in ethnobotany

(b) How endangered taxa can be conserved through forestry management practices. (2)

(a) Knowledge is wealth, it expands when we share. Explain it in terms of Ethnobotany. (4)

(b) Explain the role of ethnic groups in conservation of the plant genetic resource. (3)

a) Discuss the various protection methods of traditional knowledge in India. (4)

[This question paper contains 6 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : **5061** **H**

Unique Paper Code : 223355

Name of the Paper : LSPT-306 : Zoology (Introduction to Medical Diagnostics)

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

Semester : III

Duration : 3 Hours Maximum Marks : 75

Instructions for Candidates

Write your Roll No. on the top immediately on receipt of this question paper.

Answer **Five** questions only, including Question No. **1** which is compulsory.

(a) Define the following terms :

(i) Anemia

(ii) Metastasis

(iii) Hematocrit

(iv) Serum

(v) Electrocardiography

(5)

P.T.O.

(b) Expand the following :

(i) DOTS

(ii) WHO

(iii) MRI

(iv) TB

(v) ESR

(c) Differentiate between the following :

(i) Type I and Type II Diabetes

(ii) Benign tumor and Malignant tumor

(iii) Bleeding time and Clotting time

(iv) DLC and TLC

(v) Erythrocytes and Thrombocytes

(d) Fill in the blanks in the following Table :

	Parameter	Unit of measurement	Normal value human male
1.	Blood Volume		
2.	Blood Sugar level (fasting)		
3.	Number of leucocytes		
4	Systolic blood pressure		
5	Number of Platelets		

(e) Name the instrument used to measure/estimate the following :

(i) BP

(ii) Haemoglobin (2)

2. (a) Describe the pathogenicity of Hepatitis and suggest the methods to control the disease. (8)

(b) Write a detailed note on principle of Chromatography. List the various types. (4)

3. (a) Name the pathogen which causes malaria and the vector responsible for transmitting it. State the symptoms of malaria and discuss the ways for its prevention and control. (8)

(b) State the Beer – Lambert's Law and its applications. (4)

4. (a) Distinguish between Gram - positive and Gram - negative bacteria. Describe the method used to distinguish between these two types of bacteria. Give three examples of diseases caused by bacteria. (9)

(b) List the various types of cancer. (3)

5. (a) Describe the causes and symptoms of various types of Hepatitis infection. (9)

(b) What are the advantages of MRI over CT scan. (3)

6. (a) Perform the t-test to compare the marks obtained by 100 students in section A and B (out of 100 marks) as per data given below :

Range of marks obtained (Out of 100)	Number of students (Section A)	Number of students (Section B)
0-20	10	14
20-40	14	10
40-60	30	26
60-80	36	40
80-100	10	10

Refer to Table 1. (6

(b) Perform an appropriate statistical test to analyse the data given below :

Category	Observed frequency	Expected frequency
A	35	30
B	50	45
C	30	15
D	10	15
E	25	45

Refer to Table 2

7. Write short notes on any **three** of the following :

(i) X-ray

(ii) Hypertension

(iii) Clinical significance of WBC count

(iv) Diabetes mellitus

(v) HPLC

(3×4

TABLE-1

Degrees of Freedom	p=0.05	p=0.025	p=0.01	p=0.005
1	12.71	25.45	63.66	127.32
2	4.30	6.20	9.92	14.09
3	3.18	4.17	5.84	7.45
4	2.78	3.50	4.60	5.60
5	2.57	3.16	4.03	4.77
6	2.45	2.97	3.71	4.32
7	2.36	2.84	3.50	4.03
8	2.31	2.75	3.36	3.83
9	2.26	2.68	3.25	3.69
10	2.23	2.63	3.17	3.58
11	2.20	2.59	3.11	3.50
12	2.18	2.56	3.05	3.43
13	2.16	2.53	3.01	3.37
14	2.14	2.51	2.98	3.33
15	2.13	2.49	2.95	3.29
16	2.12	2.47	2.92	3.25
17	2.11	2.46	2.90	3.22
18	2.10	2.44	2.88	3.20
19	2.09	2.43	2.86	3.17
20	2.09	2.42	2.84	3.15
21	2.08	2.41	2.83	3.14
22	2.07	2.41	2.82	3.12
23	2.07	2.40	2.81	3.10
24	2.06	2.39	2.80	3.09
25	2.06	2.38	2.79	3.08
26	2.06	2.38	2.78	3.07
27	2.05	2.37	2.77	3.06
28	2.05	2.37	2.76	3.05
29	2.04	2.36	2.76	3.04
30	2.04	2.36	2.75	3.03
40	2.02	2.33	2.70	2.97
60	2.00	2.30	2.66	2.92
120	1.98	2.27	2.62	2.86
infinity	1.96	2.24	2.58	2.81

P.T.O.

TABLE-2

Percentage Points of the Chi-Square Distribution

Degrees of Freedom	Probability of a larger value of x^2								
	0.99	0.95	0.90	0.75	0.50	0.25	0.10	0.05	0.01
1	0.000	0.004	0.016	0.102	0.455	1.32	2.71	3.84	6.63
2	0.020	0.103	0.211	0.575	1.386	2.77	4.61	5.99	9.21
3	0.115	0.352	0.584	1.212	2.366	4.11	6.25	7.81	11.34
4	0.297	0.711	1.064	1.923	3.357	5.39	7.78	9.49	13.28
5	0.554	1.145	1.610	2.675	4.351	6.63	9.24	11.07	15.09
6	0.872	1.635	2.204	3.455	5.348	7.84	10.64	12.59	16.81
7	1.239	2.167	2.833	4.255	6.346	9.04	12.02	14.07	18.48
8	1.647	2.733	3.490	5.071	7.344	10.22	13.36	15.51	20.09
9	2.088	3.325	4.168	5.899	8.343	11.39	14.68	16.92	21.67
10	2.558	3.940	4.865	6.737	9.342	12.55	15.99	18.31	23.21
11	3.053	4.575	5.578	7.584	10.341	13.70	17.28	19.68	24.72
12	3.571	5.226	6.304	8.438	11.340	14.85	18.55	21.03	26.22
13	4.107	5.892	7.042	9.299	12.340	15.98	19.81	22.36	27.69
14	4.660	6.571	7.790	10.165	13.339	17.12	21.06	23.68	29.14
15	5.229	7.261	8.547	11.037	14.339	18.25	22.31	25.00	30.58
16	5.812	7.962	9.312	11.912	15.338	19.37	23.54	26.30	32.00
17	6.408	8.672	10.085	12.792	16.338	20.49	24.77	27.59	33.41
18	7.015	9.390	10.865	13.675	17.338	21.60	25.99	28.87	34.81
19	7.633	10.117	11.651	14.562	18.338	22.72	27.20	30.14	36.19
20	8.260	10.851	12.443	15.452	19.337	23.83	28.41	31.41	37.57
22	9.542	12.338	14.041	17.240	21.337	26.04	30.81	33.92	40.29
24	10.856	13.848	15.659	19.037	23.337	28.24	33.20	36.42	42.98
26	12.198	15.379	17.292	20.843	25.336	30.43	35.56	38.89	45.64
28	13.565	16.928	18.939	22.657	27.336	32.62	37.92	41.34	48.28
30	14.953	18.493	20.599	24.478	29.336	34.80	40.26	43.77	50.89
40	22.164	26.509	29.051	33.660	39.335	45.62	51.80	55.76	63.69
50	27.707	34.764	37.689	42.942	49.335	56.33	63.17	67.50	76.15
60	37.485	43.188	46.459	52.294	59.335	66.98	74.40	79.08	88.38

This question paper contains 4 printed pages.

Your Roll No. .....

Sl. No. of Ques. Paper	: 5090	**H**
Unique Paper Code	: 216555	
Name of Paper	: Genetics and Genomics (LSPT-512)	
Name of Course	: B.Sc. (Prog.) Life Sciences	
Semester	: V	
Duration	: 3 hours	
Maximum Marks	: 75	

(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt five questions in all, including Question No. 1 which is compulsory.

All questions carry equal marks.

1. (a) Define (any *five*):

   (i) Barr body

   (ii) Pseudodominance

   (iii) Missense mutation

   (iv) Proteomics

   (v) Dicentric chromosome

   (vi) Conditional lethal mutation. 1×5=5

   (b) Give one contribution of (any *five*):

   (i) Barbara McClintock

   (ii) W. Sutton and T. Boveri

6. (a) What are physical mutagens? Discuss the role of ionizing and non-ionizing radiations in inducing mutation. 8

(b) Explain the Celera genomics project and the sequencing methodology used in the project. 7

7. (a) What is Pedigree Analysis? Explain the inheritance of X-linked recessive inheritance with the help of a suitable example. 8

(b) Explain why the recombination frequency never exceeds 50%. 5

(c) Give the number of barr bodies present in an individual with chromosomal constitution XXXXYY and XXYY. 2

Partt
002092

This question paper contains 6 printed pages.

Your Roll No. .....

H

Sl. No. of Ques. Paper : **5065**

Unique Paper Code : **217361**

Name of Paper : **CHPT-303 (Solutions, Conductance, Eletrochemistry and Functional Group Organic Chemistry - II)**

Name of Course : **B.Sc. Life Sc. / PhySc. / Industrial Chem. / AnalyticalChem.**

Semester : **III**

Duration : **3 hours**

Maximum Marks : **75**

(Write your Roll No. on the top immediately on receipt of this question paper.)

Answer six questions in all, three questions from each Section.

Use of scientific calculator is allowed.

Use separate answer sheets for Section A and Section B.

SECTION A

Attempt three questions in all.

Question No. 1 is compulsory.

All questions carry equal marks.

1. Attempt any *five* questions:

(a) Explain why a eutectic mixture has a definite composition and sharp melting point yet it is not a compound.

(b) What are the electrochemical reactions that take place at calomel electrode?

(c) The ionic molar conductivity of hydrogen ion is much greater than any other ion. Give reason.

(d) How will you explain the presence of both lower and upper CST for certain systems?

(e) Give and justify the number of components in the system:

$$CaCO_3(s) \rightleftharpoons CaO(s) + CO_2(g)$$

(f) Usually a saturated solution of KCl or NH_4NO_3 is used in the salt bridge. Explain.

(g) Explain why enthalpy and volume of mixing for the formation of ideal binary solution is zero.

(h) State and explain Kohlrausch's law of independent migration of ions. 2½×5=12½

2. (a) What is meant by the process-solvent extraction? Explain why the process of extraction is more efficient if the solvent is used in a number of small portions rather than in one whole lot.

(b) Why do binary solutions deviate from ideality? The vapour pressure of pure benzene and toluene at 40°C are 184.0 torr and 59.0 torr, respectively. Calculate the partial pressures of benzene and toluene, the total vapour pressure of the

solution and the mole fraction of benzene in the vapour above the solution that has 0.40 mol fraction of benzene. Assume that the solution is ideal.

(c) Differentiate between congruent and incongruent melting points. 4,6,2½

3. (a) Define specific conductance, molar conductance and equivalent conductance, What are their S.I. units?

(b) The molar conductances of sodium acetate, hydrochloric acid and sodium chloride at infinite dilution are 91.0×10^{-4}, 426.16×10^{-4} and 126.45×10^{-4} S m^2 mol^{-1}, respectively at 25°C. Calculate the molar conductance at infinite dilution for acetic acid. Is transport number of ions related to molar conductivity at infinite dilution? Give reason for your answer.

(c) Draw and explain the conductometric titration of a weak acid with a strong base. 4½,4,4

4. (a) Differentiate between concentration cell with and without transference.

(b) The emf of the cell

$$Cd, CdCl_2.2{\cdot}5H_2O \text{ (saturated)} \parallel AgCl(s), Ag$$

in which the cell reaction

$$Cd(s) + 2AgCl(s) + aq \rightleftharpoons CdCl_2.2{\cdot}5H_2O \text{ (sat.)} + 2Ag(s)$$

is 0.6753 volt at 25°C and 0.6915 volt at 0°C. Calculate the free energy change (ΔG), enthalpy change (ΔH) and entropy change (ΔS) of the cell reaction at 25°C.

(c) How is the pH of a solution determined using (i) hydrogen electrode and (ii) quinhydrone electrode? 4,4½,4

5. Write short notes on:

(a) Moving Boundary Method

(b) Phase Diagram of Sulphur

(c) Lever Rule or Glass Electrode. 4½,4,4

Section B

Attempt three questions in all.

All questions carry equal marks.

6. (a) Arrange the following acid derivatives in decreasing order of reactivity towards nucleophilic substitution and give reason:

$(CH_3CO)_2O$, CH_3COCl, $CH_3COOC_2H_5$, CH_3CONH_2

(b) Explain the following:

(i) Acetyl chloride is hydrolysed more readily than benzoyl chloride.

(ii) Benzoic acid is stronger acid than acetic acid.

(iii) *p*-hydroxy benzoic acid is weaker acid than *m*-hydroxy benzoic acid.

(c) Discuss Hell-Volhard-Zelinsky reaction with mechanism.

(d) Complete the following reactions:

(i) $C_6H_5CHO + (CH_3CO)_2O \xrightarrow{\text{Base}} A + B$

(ii) $BrCH_2COOC_2H_5 + CH_3COCH_3 \xrightarrow[(ii)\ H_2O]{(i)\ Zn,\ ether} C$

2,4½,3,3

7. (a) Write short notes on the following (any *two*):

(i) Gabriel's Phthalimide Synthesis

(ii) Hofmann Bromamide Reaction

(iii) Schotten-Baumann Reaction.

(b) How will you chemically differentiate between aniline and N-methyl aniline?

(c) Complete the reactions:

(i) $ArNH_2 + CHCl_3 + 3KOH \rightarrow A$

(ii) $ArNH_2 + Br_2 \xrightarrow{CS_2} B$

(iii) $ArN_2^+Cl^- + H_2O/H^+ \xrightarrow{\Delta} C$

(d) Give a detailed account of Hofmann elimination and compare it with Saytzeff elimination. 5,2,2,3½

8. (a) How will you convert D-arabinose to D-glucose and D-mannose by Killiani-Fischer synthesis?

(b) How will you convert D-glucose to D-fructose?

(c) Draw the Haworth projection for α-D-glucopyranose and β-D-fructofuranose.

(d) Write short notes on the following:

(i) Mutarotation

(ii) Ruffs Degradation. 2½,3,2,5

9. (a) Give the name and mechanism of the reaction involved in the synthesis of ethyl acetoacetate from ethyl acetate.

(b) What is tautomerism? Give the structures of keto and enol form of ethyl acetoacetate.

(c) How can the following compounds be obtained from ethyl acetoacetate:

(i) 2-Pentanone

(ii) Butanoic acid

(iii) Succinic acid? 5,3,4½