This question paper contains 4 printed pages]

Roll No. | | | | | | | | | | | |

S. No. of Question Paper : 6731

Unique Paper Code : 32231101 IC

Name of the Paper : Non-Chordates I : Protists to Pseudocoelomates

Name of the Course : B.Sc. (H) Zoology

Semester : I

Duration : 3 Hours Maximum Marks : 75

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

Attempt any *five* questions including

Q. No. 1 which is compulsory.

Attempt various parts of question at one place only.

Draw well-labelled diagrams wherever necessary.

1. (*a*) Differentiate between the following pairs of terms (any *four*) : 8

(*i*) Primary host and Secondary host

(*ii*) Polyp and Medusa

(*iii*) Cilia and Flagella

P.T.O.

(*iv*) Hermatypic corals and Ahermatypic corals

(*v*) Encystation and Excystation

(*vi*) Mature binucleate cyst and quadrinucleate cyst of *Entamoeba histolytica*.

(*b*) Define the following terms (any *three*) : 3

(*i*) Cyclosis

(*ii*) Metamerism

(*iii*) Radial symmetry

(*iv*) Polyembryony.

(*c*) Give *one* function of each of the following : 4

(*i*) Renette cells

(*ii*) Contractile vacuole

(*iii*) Trichocysts

(*iv*) Seminal receptacle.

(*d*) Give generic names of any *five* of the following organisms. Classify up to class and write one identifying feature of phylum in each case : 10

(*i*) Glass rope sponge

(*ii*) Pork tapeworm

(*iii*) Filarial worm

(*iv*) Mushroom Coral

(*v*) Organ pipe coral

(*vi*) Comb jelly.

(*e*) Match the terms in Column 'A' with the organisms in Column 'B' : 2

Column 'A'	Column 'B'
(*i*) Amphids	(1) *Amoeba*
(*ii*) Pinacoderm	(2) *Aurelia*
(*iii*) Statocyst	(3) *Ascaris*
(*iv*) Circumvallation	(4) *Sycon*

2 (*a*) With the help of neat labelled diagrams explain the process of conjugation in *Paramecium*. Add a note on its significance. 8

(*b*) Explain the sol-gel theory of amoeboid movement. Draw suitable diagrams to explain the movement. 4

3. Give a detailed account of the life cycle and pathogenicity of the filarial worm. Add a note on its nocturnal periodicity in human beings. 12

4. Explain the different types of canal system found in poriferans. Draw well labelled diagrams and add a note on the importance of canal system in sponges. 12

. Give the scientific and common name of the parasite causing liver rot in sheep. Describe its life cycle in detail supported with neat and labelled diagrams. 12

P.T.O.

6. (*a*) Write the general characteristics of phylum Ctenophora. Discuss its affinities with Phylum Cnidaria. 6

(*b*) Give a brief account of the parasitic adaptations in cestodes. 6

7. Write short notes on any *three* of the following : 4,4,4

(*a*) Coral reefs

(*b*) Reproduction in *Euglena*

(*c*) Erythrocytic life cycle of *Plasmodium vivax*

(*d*) Metagenesis in *Obelia*

(*e*) Segmentation in metazoans.

This question paper contains 4 printed pages]

Roll No. | | | | | | | | | | | |

S. No. of Question Paper : 6732

Unique Paper Code : 32231102 HC

Name of the Paper : Perspectives/Principles of Ecology

Name of the Course : B.Sc. (Hons.) Zoology

Semester : I

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.

1. (*a*) State whether the following statements are true or false : 4

(*i*) Human population shows concave type of survivorship curve.

(*ii*) All individuals of same species that can interact are known as community.

(*iii*) Maximum theoretical production of new individuals under ideal conditions is known as exponential growth.

(*iv*) The primary cause of loss of biodiversity is habitat loss.

P.T.O.

(*b*) Name the scientists associated with the following terms : 6

(*i*) Exponential growth curve

(*ii*) Ecology

(*iii*) Trophic niche

(*iv*) Law of tolerance

(*v*) Logistic equation

(*vi*) Ecological efficiency.

(*c*) Define the following :

(*i*) Seral stage

(*ii*) Ecosystem

(*iii*) Mutualism

(*iv*) Food web

(*v*) Biodiversity.

(*d*) Differentiate between :

(*i*) Natality and Mortality

(*ii*) Concave and Convex survivorship curve

(*iii*) Commensalism and Mutualism.

(*iv*) Dispersal and Dispersion

(*v*) Autoecology and Synecology

(*vi*) Autogenic and Allogenic succession.

2. (*a*) Define population. Explain the density dependent factors that regulate the growth of a population. 9

(*b*) Explain Gause's principle. 3

3. (*a*) What do you understand by succession ? Discuss in detail the process of ecological succession in any *one* ecosystem. 9

(*b*) Briefly explain the vertical stratification in any *one* ecosystem. 3

4. Write in detail about wildlife conservation and management. 12

5. (*a*) Explain briefly the laws of limiting factors. 6+6

(*b*) What are '*r*' and '*k*' strategies ?

6. (*a*) Explain Nitrogen cycle with the help of diagram. 8

(*b*) Explain Ecotone and edge effect. 4

7. Write short notes on any *three* : 4+4+4

(*i*) Linear and Y-shaped food chain

(*ii*) Ecological pyramids

(*iii*) Climax community

(*iv*) Human Modified Ecosystem.

[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 (2×5=1

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

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

(0.5×10

(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
b	25	45

Refer to Table 2 (6)

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=12)

TABLE-I

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

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	1.213	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	4.353	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	34.80
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. $1\times5=5$

   (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

[This question paper contains 4 printed pages]

Your Roll No. : .....

Sl. No. of Q. Paper : **8635** **HC**

Unique Paper Code : 42237903

Name of the Course : **Zoology : DSE for programme**

Name of the Paper : Animal Biotechnology

Semester : V

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

Instructions for Candidates :

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

(b) Attempt any **Five** Question in **all** and Question No. **1** is Compulsory.

1. (a) Define the following : 1×5=5

(i) Teminism

(ii) Transformation efficiency

(iii) Bioreactor

(iv) Phagemid

(v) Superbug

P.T.O.

(b) Differentiate between the following : 2×5=10

(i) Stringent and Relaxed Plasmid

(ii) Colony and Plaque hybridization

(iii) Restriction enzymes type I and Restriction enzymes type II

(iv) Probe and primer

(v) Isoschizomers and Isocaudomers

(c) Mention the function of the following : 1×4=4

(i) Polyethylene glycol

(ii) RNase H

(iii) Alkaline Phosphatase

(iv) Shuttle vectors

(d) Expand the following : 1/2×6=3

(i) MCS

(ii) SCID

(iii) VNTR

(iv) PAGE

(v) ORI

(vi) pUC

(e) State the contribution of the following Scientists : 1×5=5

(i) Gilbert

(ii) Karl Ereky

(iii) Lederberg

(iv) Alec Jeffery

(v) Boyer and Cohen

2. (a) Describe various methods for the production of transgenic animals. 6

(b) Explain the molecular diagnosis of Sickle cell anemia along with a diagram. 6

3. (a) Explain Gene therapy and its significance with examples. 6

(b) What is somatic cell hybridization and briefly mention the steps involved. 6

4. (a) Diagrammatically explain the Southern blotting technique and give its applications. 6

(b) Describe the method for the production of recombinant human Growth hormone. 6

5. (a) Briefly explain the concept of genomic library and the steps involved in its construction . 6

(b) Write an account of Sanger method for DNA sequencing. 6

6. (a) Diagrammatically represent the Ti-plasmid and give its applications. 6

(b) Explain the principle of production of transgenic herbicide tolerant plants. 6

7. Write short notes on any **three** : 3×4=12

(a) Alpha Complementation

(b) Production and application of Bt cotton

(c) Microinjection method

(d) DNA Microarray

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 7354 **HC**

Unique Paper Code : 32235901

Name of the Paper : Animal Cell Biotechnology

Name of the Course : **Zoology : Generic Elective for Honours**

Semester : I

Duration : 3 Hours Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Answer **five** questions in all.
3. Question No. **1** is compulsory.

1. (a) Distinguish between any **five** of the following : (2×5=10)

   (i) Cloning & Expression vectors

   (ii) Exonucleases and Endonucleases

   (iii) Type I and Type II Restriction endonucleases

   (iv) Western blotting and Northern blotting

P.T.O.

(v) Staggered ends and Flush ends

(vi) Monoclonal and Polyclonal antibody

(b) Define any **Six** of the following : (6)

(i) Super-ovulation

(ii) Transgenics

(iii) Plasmids

(iv) Primary Cell Culture

(v) Transfection

(vi) Colony Hybridization

(vii) Patents

(c) Expand any **five** of the following : (5)

(i) pSc101

(ii) PAGE

(iii) SCID

(iv) FISH

(v) PEG

(vi) RT PCR

(d) Explain any **two** of the followings : (3×2=6)

(i) The advantage of using Taq polymerase in PCR

(ii) Electroperation

(iii) Principle of Nucleic Acid Hybridization

2. (a) What are the essential features of a cloning vector? Explain the different types of cloning vectors mentioning their limitations. (8)

(b) What is DNA fingerprinting? Write its role in Forensic Science. (4)

3. (a) What is the principle underlying the production of monoclonal antibody? Add a note on its any two important applications. (9)

(b) Explain transformation using calcium chloride method. (3)

4. (a) What are recombinant vaccines? How are these vaccines more efficient than the conventional vaccines. (7)

(b) What is DNA Microarray? Add a note on its applications. (5)

5. (a) What is cDNA 'library? Write down the method of synthesis of cDNA. (6)

(b) What are transgenic animals? Explain their significance for human welfare. (6)

6. (a) Explain the method of production of recombinant insulin with the help of suitable diagrams. (6)

(b) Explain the role of gene therapy in therapeutics. (6)

7. Write short notes on any **three** of the following : (4×3=12)

(a) Sanger's method of DNA sequencing

(b) Poly acrylamide gel electrophoresis

(c) Southern Blotting

(d) PCR