RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College affiliated to University of Calcutta)

SECOND YEAR [2017-20]

B.A./B.Sc. THIRD SEMESTER (July – December) 2018

Mid-Semester Examination, September 2018

Date : 24/09/2018

ZOOLOGY (Honours)

Time : 11 am – 1 pm

Paper : III

Full Marks : 50

1. Answer **any five** questions : [5×2]

   a) What is DNA loop? Describe its role in gene transcription. [1+1]

   b) What is phytoremidiation?

   c) What is Heteroduplex?

   d) Describe two techniques for detecting HbH from blood smear.

   e) What is a probe?

   f) Define "Law of the Minimum".

   g) State why a population is regarded as the smallest unit that can evolve.

   h) Distinguish between potential and realised natality.

2. Answer **any four** questions : [4×5]

   a) Describe why the *Universal Model of Energy Flow is* considered as the best model. Explain how the partly upright pyramid of number is formed? Mention two advantages of pyramid of number. [3+1+1]

   b) "Green house gases are beneficial"- explain. Define eutrophication. Describe photochemical smog. [2+1+2]

   c) "Man-elephant conflict can be avoided by protecting elephant corridors" – justify.
   Write a short note on 'Biodiversity hotspots of India'. [1.5+3.5]

   d) What is dispersion? Describe the basic dispersion patterns with examples.
   Why a population fails to grow continuously under really existing environment? [3+2]

   e) Discuss with suitable examples how living organisms are confronted with *r-K Trade-off* depending on their selective environment. [5]

   f) Estimate net reproductive rate from the following demographic data. [5]

	(x)	$(n)_x$	$(l)_x$	m_x
0.	1	1000	1.00	----
1.	2	800	0.80	----
2.	3	580	0.58	0.41
3.	4	310	0.33	0.46
4.	5	120	0.12	0.15
5.	6	0	0.00	----

3. Answer **any four** questions : [4×5]

a) Explain the principle of COBRA assay to detect DNA methylation. Describe the different probable origin and corresponding classical syndromes associated with β thalassemia. [2+3]

b) Describe mechanistically how histone acetylation would confer gene activation by chromosomal remodelling with suitable example. [5]

c) What is MPF? How did Market and Ecker propose its role in cell-cycle? What is the role of p27 in cell cycle? [1+2+2]

d) Explain the role of cAMP and CAP protein in lac operon. What do you mean by 'Gratuitous inducer'? Site an example. [3+2]

e) Conduct one experiment to separate mRNA from a mixture of RNAs. List out the functions of various chemicals used in extraction of genomic DNA in Phenol-Chloroform extraction process. [2.5+2.5]

f) What is the biological function of restriction endonucleases? Explain the function of E.coli DNA ligase and Polynucleotide Kinase in RDT. [2+3]

g) Differentiate between resolution and dissolution. Explain the importance of Serine and Tyrosine in conservative site specific recombination. [2+3]

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