# Bangabasi College

## B. Sc. Part I Test Examination, 2014

## ZOOLOGY HONOURS

*Candidates are required to use **Separate Answer Scripts** for Each Group*

Full Marks: 100 Time: 4 Hours

*Answer Question Number 1 (Compulsory) and 3 from each group*

1. Answer any five of the following: 2 × 5 = 10
   a. State the functions of Ctenidia in insects.
   b. Distinguish between Class Polyplacophore and Class Monoplacophore. Give examples.
   c. Differentiate barrier reef from that of fringing reef.
   d. What are Rabdities? What is its function ?
   e. What is meant by "Active site" of an enzyme?
   f. What is Chloride shift?
   g. Prokaryotic ribosome is made of 30S & 50S subunits- explain the unit "S" (Svedberg).
   h. Mention four symptoms of Down syndrome.
   i. Cite two differences between polytene chromosome and lampbrush chromosome.
   j. Diffentiate between scotopic and photopic vision.

### Paper I Unit I : Animal diversity I: Non Chordates

(Answer *any three* questions from following)

2. (a) Discuss the affinities of *Balanoglossus* sp.
   (b) Describe the role of algae in the formation of coral reefs. Write the importance of coral reefs in ecosystem. 5+3+2= 10
3. Place the following animals (any four) into their respective systematic position with reasons mentioning at least two diagnostic feature of each taxon 2.5X4=10
   (a) *Cyclops* sp.,(b) Sea hare.,(c) *Antedon* sp.,(d) *Taenia* sp.,(e) Blood worm,(f) *Monocystis* sp.
   (g) Bath Sponge.
4. (a) Illustrate the Nervous organization of a common Gastropod and characterize it.
   (b) Compare and contrast the respiratory system of Scorpion and Kingcrab. (2+3)+5= 10
5. (a) Describe the larval forms of Asteroidea. Discuss the phylgenetic importance of the larval forms of echinoderm.
   (b) Write short note on Tubefeet and Tiedmann's body. 4+4+2=10
6. (a) Why a *Parameocium* known as heterokaryotic animal ?
   (b) Give an account of ciliary movement in *Paramoecium* sp.
   (c) Draw and describe the Leuconoid canal system and show the course of water current with the help of a flow chart. 1+4+5=10

### Paper I Unit II : Cell Biology and Genetics

(Answer *any three* questions from following)

7. (a) If the wavelength of electron beam is 0.005 nm, calculate the limit of resolution for the microscope.
   (b)State the importance of GERL system in formation of lysosome.
   (c) State the importance of Cardiolipin.
   (d) Differentiate between smooth and rough endoplasmic reticulum. 4+2+1+3= 10
8. (a) Write a short note on the enzyme content of a lysosome.
   (b)Define endosome and phagosome.
   (c) Mitochondria has extreme similarity with prokaryotes- justify. 5+2+3=10
9. (a) Mention the role of SRY in human sex determination.
   (b) Define transition and transversion types of mutation.
   (c) State briefly the regulatory cascade mechanism of sex determination of Human or *Drosophila*

with flow diagram. 3+2+5= 10

10. (a) In *Drosophila*, Dichaete is a dominant wing shape mutation and the pink and ebony are the recessive mutations affecting the eye colour and body colour respectively.
A Dichaete stock were crossed to homozygous pink ebony flies. The F1 flies with Dichaete phenotype were back crossed to the pink ebony homozygous and the following results were obtained-

| Phenotype | Number |
|---|---|
| Dichaete | 811 |
| Pink ebony | 844 |
| Dichaete ebony | 200 |
| Pink | 199 |
| Dichaete pink | 12 |
| Dichaete pink ebony | 30 |
| Ebony | 19 |
| Wild type | 35 |

Determine-
i) The recombination distance between the genes and their linkage order.
ii) Coefficient of coincidence. 7+3

11. (a) What is meant by Okazaki fragment?
(b) Why lagging strand is synthesized in small fragments?
(c) Cite names of 4 proteins involved in replication initiation. Describe their roles. 2+2.5+5.5=10

Or

(a) What is meant by co-dominance? Describe it with an example.
(b) What do you mean by Bombay phenotype?
(c) What do you mean by endoreplication?
(d) Distinguish between polytene puff and lampbrush loop. 3+2+2+3=10

**Paper II UNIT I : Biochemistry and Animal Physiology**

(Answer *any three* questions from following)

12. (a) What are R and T states of haemoglobin?
(b) Distinguish between competitive and non-competitive inhibition of enzymes.
(c) How glucose is formed from lactate? 2+3+5 = 10

13. (a) What is Michaelis- Menten constant? Explain the phenomenon of enzyme kinetics by using Michaelis- Menten constant.
(b) State the role of glycogen synthase. 5+2+3 = 10

14. (a) Define Ectothermic and endothermic animals.
(b) Describe the behavioral and physiological adaptations of animals exposed to cold or hot.
(c) Draw and describe the structure of hair cells of mammalian inner ear. 2+4+4 =10

15. (a) Briefly discuss the transduction of sound energy into nerve impulse in the inner hair cells of the organ of Corti.
(b) What is filtration membrane in kidney? State its significance. 6+1+3 =10

Or

16. a. Describe with suitable diagram the formation of action potential in the excitatory nerve.
b. What is GFR? Give a precise description of the mechanisms for regulating GFR in the kidney. 2+2+6=10

16. (a) Cite the role of cytochrome in ETS.
(b) How proton motive force drive the molecular machine of ATP generation. 4+6=10

Or

a. Describe the role of different bonds in the protein complexity.
b. Differentiate between unsaturated and saturated fatty acid.
c. What is PUFA? 5+3+2=10