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1 (Sem-4/FYUGP) ZLG 41 MJ

2026

ZOOLOGY

(Major)

Paper : ZIG4400104MJ

**(Animal Taxonomy, Systematics
and Biostatistics)**

Full Marks : 45

Time : 2 hours

*The figures in the margin indicate
full marks for the questions.*

Q. No. 1 is compulsory in both **PART-A** and **PART-B**.

PART-A

(Animal Taxonomy, Systematics)

1. Answer the following questions as directed :

1×4=4

(i) _____ coined the term taxonomy.
(Fill in the blank)

(ii) A group of interconnected genera is called an order

(Write true or false)

(iii) Name the only taxonomic category that has a real existence.

(iv) The term systematic was used for the first time by Linnaeus in

(Choose the correct option)

(a) 1st edition of Systema Naturae in 1758

(b) 1st edition of Species Plantarum in 1753

(c) 4th edition of Systema Naturae in 1735

(d) 4th edition of Systema Naturae in 1758

2. Write short notes on **any three** : 2×3=6

(i) Cryptic Species

(ii) Taxonomic key

(iii) Linnaean Hierarchy

(iv) Cladogram

(v) IUBS

3. Answer the following questions : *(any two)*

5×2=10

(i) What is new systematics? Distinguish between chemotaxonomy and Cytotaxonomy.

1+4=5

(ii) What is species? Write a brief comparative note on Biological species concept and Morphological species concept.

1+4=5

(iii) What do you mean by derived character? Distinguish between Homology and Analogy.

1+4=5

(iv) Distinguish between Holotype and Paratype. Add a note on importance of type specimen.

3+2=5

4. Answer elaborately : *(any one)* 10×1=10

(i) Explain the following : 2+8=10

(a) Principle of priority

(b) Systematics plays important role in the field of applied biology.

(ii) What is the full form of ICZN? Elaborate the principles and functions of ICZN.

1+6=3=10

PART-B

(Biostatistics)

1. Give the formula for calculating Standard deviation for ungrouped data. 1

2. Write very briefly on : *(any two)* 2×2=4

(i) Frequency distribution

(ii) Mathematical average and Positional average

(iii) Percentile and Quartile

(iv) Correlation and regression

3. Answer **any two** from the following :

$$5 \times 2 = 10$$

(i) Discuss the importance of statistics in biology.

(ii) Following table shows the distribution of blood groups in male and female students of a college.

Blood group	No of Students	
	Male	Female
A	427	317
B	559	412
O	521	367
AB	122	85

Draw a pie-diagram for distribution of blood groups.

(iii) Calculate median from the following data :

x	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60
f	15	17	32	13	13	10

(iv) Define sample. Describe the different sampling method used in biostatistics.

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1 (Sem-4/FYUGP) ZLG 42 MJ

2026

ZOOLOGY

(Major)

Paper : ZLG4400204MJ

(Animal Physiology and Endocrinology)

Full Marks : 45

Time : 2 hours

*The figures in the margin indicate
full marks for the questions.*

1. Multiple choice questions :
(all are compulsory) $1 \times 5 = 5$

- (a) The Nodes of Ranvier are found in
- (i) Nerve cells
 - (ii) Heart cells
 - (iii) Liver cells
 - (iv) All of the above
- (b) In a contracted skeletal muscle fiber, which of the following statement is correct?
- (i) I Band disappears
 - (ii) M line vanishes
 - (iii) H zone elongates
 - (iv) A Band remains constant
- (c) α and β cells of pancreas are involved in the secretion of respectively
- (i) Insulin and Glucagon
 - (ii) Glucagon and Insulin
 - (iii) Somatostatin and Insulin
 - (iv) Insulin and Glycogen
- (d) The primary hormone associated with the production of RBC is
- (i) growth hormone
 - (ii) Erythropoietin
 - (iii) Insulin
 - (iv) Adrenaline

(e) The functional unit of the contractile system in striated muscle is

- (i) Sarcomere
- (ii) Myofibril
- (iii) Z Band
- (iv) Cross-bridge

2. Short answer type questions : (any five)
 $2 \times 5 = 10$

- (a) Skeletal muscles are known as striated muscles. Why?
- (b) Write the functions of columnar epithelium in the intestine.
- (c) Importance of respiratory pigments.
- (d) Importance of villi and microvilli in intestinal absorption.
- (e) Write the names of posterior pituitary hormones with their functions.
- (f) Role of ADH.
- (g) What are the Neuro transmitters? Write their functions.
- (h) Ampulla of vater is a common passage for bile and pancreatic juice—Justify the statement.
- (i) Differentiate between action potential and resting potential.
- (j) Role of synapse in impulse transmission.

3. Long answer type questions : (any four)
 $5 \times 4 = 20$

- (a) Describe the mechanism of urine formation.

- (b) Describe the feedback mechanism of hormones with an example.
- (c) Write the Intrinsic mechanism of blood clotting.
- (d) Write a note on the types and structure of heart.
- (e) Discuss the Hypothalamus-hypophyseal portal system.
- (f) Describe the structure of connective tissue with diagram.
- (g) Describe the absorption process of fatty foods in human.
- (h) Discuss the Hans Krebs cycle involved in urea production.

4. Essay type questions : (**any one**) $10 \times 1 = 10$

- (a) Describe the structure and functions of pancreas as endocrine gland.
 $5+5=10$
- (b) Describe the mechanism of O_2 and CO_2 transport in human.
 $5+5=10$
- (c) What are the digestive enzymes? Describe the functions of digestive enzymes for protein and carbohydrates.
 $5+5=10$
- (d) Describe the mechanism of Nerve in a pulse transmission through a non-myelinated nerve fibre.

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1 (Sem-4/FYUGP) ZLG 44/45/46 MJ

2026

ZOOLOGY

(Major)

Answer the Questions from any one Option.

OPTION-I

Paper : ZLG4400404MJ

(Comparative Anatomy of Vertebrates)

OPTION-II

Paper : ZLG4400504MJ

(Animal Behaviour and Chronobiology)

OPTION-III

Paper : ZLG4400604MJ

(Parasitology)

Full Marks : 45

Time : 2 hours

*The figures in the margin indicate
full marks for the questions.*

OPTION-I

Paper : ZLG4400404MJ

(Comparative Anatomy of Vertebrates)

1. Multiple choice questions :

(All are compulsory)

1×5=5

- (a) Sebaceous gland is an epidermal derivatives of —
(i) Soft epidermis
(ii) Hard epidermis
(iii) Both (i) and (ii)
(iv) None of the above
- (b) Which of the following is not a part of the axial skeleton ?
(i) Skull
(ii) Vertebral column
(iii) Rib cage
(iv) Pelvic girdle
- (c) Dental formula of man is $2/2, 1/1, 2/2, 3/3 = 32$. What is the dental formula of an elephant :
(i) $1/0, 0/0, 0/0, 3/3 = 14$
(ii) $0/0, 1/1, 0/0, 3/3 = 16$
(iii) $1/1, 0/0, 0/0, 3/3 = 16$
(iv) None of the above

(d) Which one of the following represents the true stomach in ruminants ?

- (i) Rumen
(ii) Reticulum
(iii) Omasum
(iv) Abomasum

(e) Hepatic portal system is associated with—

- (i) Lung
(ii) Liver
(iii) Stomach
(iv) None of the above

2. Write short notes on the following :

(any five)

2×5=10

- (a) Hoofs
(b) Sternum of birds
(c) Thecodont teeth
(d) Brunner's glands
(e) Solenocytes
(f) Nephrostome
(g) Glossopharyngeal nerve
(h) Cornea

3. Answer briefly : **(any four)** $5 \times 4 = 20$

- (a) What is exoskeleton? Write a note on digital cornifications.
- (b) Write a note on cervical vertebrates of mammals.
- (c) Write a brief note on liver of an amphibian.
- (d) Describe briefly the structure of a true gill.
- (e) Write a note on larynx of bird.
- (f) Give a brief comparative account of heart of birds and mammals.
- (g) Discuss briefly about the aortic arches in reptiles.
- (h) Write a note on nephridial apparatus of Amphioxus.
- (i) Describe organ of Corti with diagram.
- (j) Describe the characteristics of respiratory organs.

4. Answer elaborately : **(any one)** $10 \times 1 = 10$

- (a) Describe the structure and modifications of vertebral column in vertebrates.

vertebrates.

- (d) Give a comparative account of structure and functions of stomach in vertebrates.

OPTION-II

Paper : ZLG4400504MJ

(Animal Behaviour and Chronobiology)

1. Choose the correct answers : $1 \times 5 = 5$

(a) _____ is a male sex hormone.

- (i) Aldosterone
- (ii) Estrogen
- (iii) Testosterone
- (iv) Melatonin

(b) The scientific and objective study of Animal Behaviour is known as

- (i) Ecology
- (ii) Ethology
- (iii) Physiology
- (iv) Ichthyology

(c) Honey bee uses _____ to convey wide range of communication.

- (i) Enzymes
- (ii) Spores
- (iii) Pheromones
- (iv) None of the above

(d) After feeding 'Royal Jelly', the larva of Honey bee develops into

- (i) Worker
- (ii) Queen
- (iii) Drone
- (iv) All of the above

(e) Termites belong to the order

- (i) Diptera
- (ii) Hymenoptera
- (iii) Blattodea
- (iv) Coleoptera

2. Write short notes on the following : $2 \times 5 = 10$
(any five)

- (a) Schooling behaviour of fish
- (b) Structure of Honey comb
- (c) Circadian Rhythms
- (d) Conditional Reflex
- (e) Biological oscillation
- (f) Dance language in honey bees
- (g) Navigation
- (h) Social behaviour in ants
- (i) Clock genes
- (j) Sleep-wake cycle

3. Answer briefly : **(any four)** $5 \times 4 = 20$

(a) Differentiate between instinct and learned behaviour with example.

(b) Describe the methods of studying behaviour.

(c) Discuss the social behaviour of Monkeys.

(d) Write the functions of biological clock in animal.

(e) Write the importance of zeitgebers in circadian rhythm.

(f) Circalunar vs Infradian rhythms.

(g) Importance of Biological time keeping.

(h) Significance of photoperiod.

4. Explain the following : **(any one)** $10 \times 1 = 10$

(a) Describe the circadian and circannual rhythms in human. $5 + 5 = 10$

(b) Discuss the phenomenon of bird migration.

(c) Discuss the Taxis and Kinesis movement in animal with example. $5 + 5 = 10$

(d) Describe the Eusocial organization in Honey bee.

OPTION-III

Paper : ZLG4400604MJ

(Parasitology)

1. Multiple choice questions : $1 \times 5 = 5$

(i) The vector of *Plasmodium vivax* is :

(a) *Culex* mosquito

(b) *Anopheles* mosquito

(c) *Aedes* mosquito

(d) Sandfly

(ii) *Taenia solium* belongs to :

(a) Nematoda

(b) Trematoda

(c) Cestoda

(d) Protozoa

(iii) The infective stage of *Ascaris lumbricoides* is :

(a) Larva

(b) Egg with larva

(c) Adult

(d) Cyst

(iv) Head louse is scientifically known as :

- (a) *Xenopsylla cheopis*
- (b) *Pediculus humanus capitis*
- (c) *Cimex lectularius*
- (d) *Ancylostoma duodenale*

(v) Trypanosomiasis is transmitted by :

- (a) Tsetse fly
- (b) Sandfly
- (c) Tick
- (d) Mosquito

2. Very short answer type questions : **(any five)**

2×5=10

- (i) Define parasitism.
- (ii) What is a definitive host? Give one example.
- (iii) Write *two* diagnostic features of *Leishmania donovani*.
- (iv) Define epidemiology and mention its importance in parasitic diseases.
- (v) Name the causative organism of filariasis and mention *one* preventive measure of filariasis.
- (vi) What is an endoparasite? Give example.

(vii) Define vector and give *one* example.

(viii) Name the vector of kala-azar and mention *one* symptom.

(ix) What is zoonosis? Give *one* example of a zoonotic parasitic disease.

(x) Mention *any two* control measures of lice infestation.

3. Short answer type questions : **(any four)**

5×4=20

- (i) Describe the host-parasite relationship with suitable examples.
- (ii) Explain the life cycle of *Plasmodium vivax* with a diagram.
- (iii) Write a note on the pathogenicity and diagnosis of *Leishmania donovani*.
- (iv) Describe the morphology and life cycle of *Taenia solium*.
- (v) Discuss the epidemiology and control of *Wuchereria bancrofti*.
- (vi) Explain the pathogenic effects of *Ascaris lumbricoides* in humans.
- (vii) Write a note on ticks and their medical importance.
- (viii) Describe the control measures of *Xenopsylla cheopis*.

4. Long answer type questions : **(any one)**

10×1=10

- (i) Describe in detail the morphology, life cycle, pathogenicity, diagnosis, and treatment of *Trypanosoma gambiense*.
 - (ii) Give a detailed account of *Schistosoma haematobium* with reference to epidemiology and control.
 - (iii) Define and differentiate between parasite, parasitoid and vector with suitable examples.
 - (iv) Write an essay on parasitic vertebrates with special reference to Candiru and Vampire bat.
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