

This question paper contains 2 printed pages

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Your Roll No. 93/5/25

Name of the Course : **B.Sc. (Hons.) Zoology**
Semester : **IV (LOCF)**
Name of the Paper : **Physiology: Life Sustaining systems**
Unique Paper Code : **32231402**
Maximum Marks : **75**
Time : **3Hr**



Instructions for candidates:

1. Write your **Roll No.** on the top immediately on receipt of this question paper
2. Attempt **FIVE** questions in all
3. Question **No. 1** is **compulsory**
4. **Draw** diagrams where ever required

Q1. (a) Define:

- 1) Haustral churning
- 2) Stroke Volume
- 3) Peristalsis
- 4) Ultrafiltration
- 5) Hematocrit

5

(b) Differentiate between the following (Any Five):

- 1) Tachycardia and Bradycardia
- 2) Myelinated and non-myelinated axons
- 3) PCT and DCT
- 4) Metabolic and respiratory acidosis
- 5) Vital capacity and Residual volume
- 6) Myenteric and Submucosal plexus

10

(c) Expand the following:

- 1) ANP
- 2) JGA
- 3) Tm
- 4) GBHP
- 5) GIP

5

(d) Give location and function of the following:

- 1) Podocytes
- 2) K-cells
- 3) Papillary Muscles
- 4) Type-II alveolar cells

4

(e) Write significance of the following:

- 1) Biconcave shape of erythrocytes
- 2) Presence of submucosal glands
- 3) Counter-current mechanism

3

Q2. (a) What is cardiac output? Explain the factors that regulate stroke volume.

(b) Comment on coronary circulation of heart.

(9+3)

Q3. (a) Draw the detailed structure of a nephron.

(b) Describe mechanism of tubular absorption and tubular secretion in PCT. Discuss glomerular capillary pressure with respect to pressure in normal blood capillaries.

(3+9)

Q4. (a) How is carbon dioxide transported by the blood? What is Haldane effect?

(b) Comment on oxygen-hemoglobin dissociation curve.

(8+4)

Q5. (a) Discuss in detail mechanical and chemical digestion in the stomach.

(b) Write a note on the portal triad.

(9+3)

Q6. Write short notes (any three):

- 1) Absorption of lipids
- 2) RAAS
- 3) Pulmonary volumes and capacities
- 4) Cardiac cycle

(4+4+4)

1314

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Roll No. 27/5/25 N

Unique paper Code: 32231403
Name of the paper: Biochemistry of Metabolic Processes
Name of the Course: B.Sc. (H) Zoology (LOCF)-OC
Semester: IV
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. Attempt *FIVE* questions in all
3. Question No. 1 is compulsory. Illustrate your answers with diagrams/structures wherever necessary.

Q.1 i) Define the following:

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- a) Anaplerotic reactions
- b) Shuttle system
- c) Oxidative deamination
- d) Dehydrogenation
- e) Ketosis

ii) Expand the following

5

- a. PEPCK
- b. NADP
- c. HMG-CoA
- d. PLP
- e. UDPG

iii) Differentiate between the following

10

- a. Oxidative phosphorylation and Substrate level phosphorylation
- b. Phosphorolysis and Hydrolysis
- c. Glycogen and Glycogenin
- d. Oxidases and Oxidoreductases
- e. Glucogenic and Ketogenic amino acid

- iv) Give the contribution of following scientists: 3
- E. Racker
 - G. Cori
 - H. Krebs
- v) Write the reaction catalyzed by the following enzymes (with structures): 4
- PDH
 - Lactate dehydrogenase
 - Transketolase
 - Glycerol kinase
- Q.2 a) Elucidate the pathway responsible for the complete oxidation of glucose aerobically. 9
- b) How many ATPs are produced in this pathway. Also indicate the steps where oxidative and substrate phosphorylation take place. 3
- Q.3 a) Discuss the process of biosynthesis of Palmitic acid. 9
- b) Add a note on the production of ketone bodies and its significance. 3
- Q.4 How do the terrestrial animals (humans) get rid of their nitrogenous waste. Discuss in detail the various steps involved in the process. 12
- Q.5 a) Describe the chemiosmotic hypothesis along with the various electron carriers of the mitochondrial respiratory chain. 9
- b) Explain the Q cycle and its importance in the Electron transport chain. 3
- Q.6 a) Describe the alternate route of glucose oxidation that occurs in cytoplasm. Briefly discuss the role of the phases involved in the process. 9
- b) Diagrammatically represent the fate of carbon skeleton of ketogenic amino acids. 3
- Q7. Write short notes (any **three**): (4X3=12)
- Debranching enzyme
 - Cori cycle
 - Biogenic amines
 - ATP synthase

[This question paper contains 4 printed pages.]

Your Roll No.

Sr. No. of Question Paper : 5540

J

Unique Paper Code : 2232012401

Name of the Paper : DSC – Comparative Anatomy
of Vertebrates

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

Semester : IV

Duration : 2 Hours

Maximum Marks : 60

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt four questions in all.
3. Question No. 1 is compulsory.
4. Draw well labelled diagrams wherever necessary.

1. (a) Define the following (any four) : (4)

(i) Corpus callosum

P.T.O.

(ii) Neurocranium

(iii) Craniostyly

(iv) Iter

(v) Carapace

(vi) Holobranch

(b) Differentiate between the following **(any two)** :
(4)

(i) Amphicoelous and heterocoelous centrum

(ii) Uteri duplex and uteri simplex

(iii) Horns and antlers

(iv) Ductus caroticus and ductus arteriosus

(c) Give exact location and function of the following
(any four) : (4)

(i) Fovea centralis

(ii) Spiracle

(iii) Aqueduct of Sylvius

(iv) Jacobson's organ

(v) Helicotrema

(vi) Foramen of panizzae

(d) State whether following statements are True/False
(any three) : (3)

(i) Mammalian skulls have a single temporal fossa.

(ii) The neurocranium of chondrichthyes is well ossified.

(iii) Cerebrospinal fluid is secreted by choroid plexus.

(iv) Post ganglionic fibres of parasympathetic nervous system are adrenergic.

(v) All mammals have seven cervical vertebrae.

2. (a) Briefly discuss the comparative account of stomach in amniotes. (6)

(b) What are the different hard derivatives of epidermis of skin in vertebrates? (9)

3. (a) Classify receptors based on their functions and give examples. (6)
- (b) With the help of labelled diagrams, illustrate the evolution of aortic arches in vertebrates. (9)
4. (a) Discuss the evolution of vertebrate kidney with the help of labelled diagrams. (12)
- (b) What is the name, nature and innervations of VII cranial nerve in mammals? (3)
5. (a) Explain the structure and function of mammalian ear with the help of suitable diagrams. (9)
- (b) Describe the structure of the gills in cartilaginous and bony fishes. (6)
6. Write short notes on **any three** of the following : (3×5=15)
- (i) Fate of first two visceral arches
 - (ii) Swim bladder
 - (iii) Scales in fishes
 - (iv) Male genital ducts

[This question paper contains 4 printed pages.]

Your Roll No.....

(29/5/25)

Sr. No. of Question Paper : 5600

J

Unique Paper Code : 2232012402

Name of the Paper : DSC – Developmental Biology

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

Semester : IV – NEP

Duration : 2 Hours

Maximum Marks : 60

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt any **four** questions including Question No. 1 which is compulsory.
3. Draw well-labelled diagrams wherever necessary.

1. (a) Define the following : (4)

(i) Primary Organizer

(ii) Delamination

P.T.O.

(iii) Spermateliosis

(iv) Gray crescent

(b) Distinguish between the following (**any two**) :

(2×2=4)

(i) Autonomous and conditional specification

(ii) Hensen's Node and Nieuwkoop Center

(iii) Yolk Sac and Yolk Plug

(c) Match the following :

(2)

(i) J.F. Gudematsch

a. Phocomelia

(ii) Thalidomide

b. Salamander regeneration

(iii) Spallanzani

c. Epigenesis

(iv) Caspar Friedrich
Wolff

d. Amphibian metamorphosis

(d) Expand the following abbreviations :

(3)

(i) AGE

(ii) DLHP

(iii) PTTH

(e) Name the germ layer from which each of the following is derived :

(2)

- (i) Notochord
- (ii) Lungs
- (iii) Adrenal Cortex
- (iv) Lens

2. (a) Describe the process of metamorphosis in amphibians. Explain the role of hormones in regulating this transformation. (8)
- (b) What is a fate map? Describe the different techniques used to construct fate maps. Draw a well-labelled fate map of the blastula stage of a frog. (7)
3. (a) Define regeneration. Explain the process of epimorphic regeneration with a suitable example, highlighting the key stages involved. (8)
- (b) Discuss the process by which the spermatid transforms into spermatozoa. (7)
4. (a) Define placenta and describe its different types based on morphological and histological criteria with suitable examples. (9)

- (b) Describe the various types of cleavage patterns in animal embryos based on the amount and distribution of yolk. Support your answer with suitable examples. (6)
5. (a) Describe the extra-embryonic membranes in a chick embryo and explain their formation and function. (8)
- (b) Define gastrulation. Illustrate and describe the various morphogenetic movements involved in gastrulation, with specific examples from amphibian embryonic development. (7)
6. Write short notes on **any three** of the following : (3×5=15)
- (a) French Flag Model
- (b) Blocks to polyspermy
- (c) Embryonic stem cells
- (d) Teratogens
- (e) Ageing



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03/6/28

Roll No.

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S. No. of Question Paper : 5679

Unique Paper Code : 2232012403

Name of the Paper : DSC : Animal Behaviour

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

Semester : IV (NEP-UGCF)

Duration : 2 Hours

Maximum Marks : 60

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

Attempt any four questions in all including Question No. 1

which is compulsory.

1. (a) Define any four of the following terms :

4×1=4

(i) Ethogram

(ii) Inclusive Fitness

(iii) Mnemotaxis

(iv) Latent Learning

(v) Polyphenism

(vi) Alloparental behavior.

P.T.O.

(b) Distinguish between any *three* of the following : 3×2=6

- (i) Orthokinesis and Klinokinesis
- (ii) Hormone and Pheromone
- (iii) Intersexual and Intrasexual selection
- (iv) Eusocial and Subsocial species
- (v) Habituation and Sensitization

(c) Match the following scientists with their contributions : 5×1=5

Column A

Column B

- | | |
|----------------------|---|
| (i) Konrad Lorenz | Communication in bees through waggle dance |
| (ii) Oskar Heinroth | Theories of parental investment and reciprocal altruism |
| (iii) W.D. Hamilton | Innate behaviour patterns |
| (iv) Karl von Frisch | Studied imprinting in birds |
| (v) Robert Trivers | Theory of inclusive fitness and Kin selection |

2. (a) Explain associative learning. Add a note on Skinner's experiment to describe operant conditioning. 8

(b) Classify and explain the orientation behaviour with the help of suitable examples. 7

3. (a) Describe various types of dances performed by forager honeybees. With the help of diagram explain the distance and direction component of waggle dance. 8
- (b) What is stimulus filtering ? With suitable example explain its biological significance. 7
4. What is altruism in animal behaviour ? Explain its different types with examples. Why do some animals exhibit altruistic behaviour despite potential risks to their own survival ? 15
5. Explain the concept of male rivalry in animals. Describe *three* distinct ways in which males compete for mates and briefly discuss the advantages gained by the winning male. 15
6. Write short notes on any *three* of the following : 3×5=15
- (a) Innate behaviour
- (b) Courtship behavior
- (c) Imprinting
- (d) Code breaker
- (e) Artificial intelligence.

This question paper contains 4 printed pages]

04/6/25 R

Roll No.

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S. No. of Question Paper : **8063**

Unique Paper Code : **2233012008**

Name of the Paper : **DSE-8, Parasitology**

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

Semester : **IV, (DSE-8)**

Duration : **3 Hours**

Maximum Marks : **90**

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

Attempt any *five* questions in all, including

Question No. 1, which is compulsory.

1. (i) Explain the following terms :

5×2=10

(a) Incubation period

(b) Facultative parasite

(c) Schizogony

(d) Strobila

(e) Apolysis.

P.T.O.

- (ii) Match the following terms in the column A with the organism in column B : 5

'A'

'B'

- | | |
|-------------------------|-------------------------------|
| (a) Organ of Berlese | (i) Flea |
| (b) Promotal Comb | (ii) <i>Plasmodium vivax</i> |
| (c) Sporozoite | (iii) <i>Cimexlectularius</i> |
| (d) Oncosphere | (iv) <i>Schistosoma</i> spp |
| (e) Gynaecophoric canal | (v) <i>Taenia solium</i> |

- (iii) Differentiate between any *five* of the following terms : 5×2=10

- (a) Primary host and Secondary host
- (b) Parasite and Host
- (c) Gravid and Mature proglottid
- (d) Epidemic and Endemic disease
- (e) Monogenetic and Digenetic life history
- (f) Head louse and Body louse.

(iv) Write the vector of the following :

5

(1) Cholera

(2) Malaria

(3) Leishmaniasis

(4) Elephantiasis

(5) Plague.

2. What is digenetic life cycle ? Explain it with reference to life history of *Fasciolopsis buski*. 15
3. Explain the life cycle, pathogenicity and control of *Trichinella spiralis*. 15
4. What are the clinical manifestations of *Wuchereria bancrofti* ? How is it transmitted, diagnosed and treated ? 15
5. Discuss in detail about the morphology, life-cycle and pathogenicity of *Trypanosoma gambiense*. 15
6. (i) With the help of a neat and labelled diagram write detailed note on the life cycle of *Xenopsylla cheopis*. 7
- (ii) State the habit and habitat of *Xenopsylla cheopis*. Give the medical importance of this insect. 8

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

3×5=15

- (a) *Ascariasis*
- (b) Life cycle of *Entamoeba histolytica*
- (c) Biology of *Pediculus humanus*
- (d) Vampire bat
- (e) Life cycle of *Ascaris lumbricoides*.