

6. Write short notes (attempt any **three**):

3×5=15

- (i) High-altitude adaptations in various vertebrate classes.
- (ii) Structure and digestion in different compartments of the rumen.
- (iii) Modes of reproduction in various vertebrates.
- (iv) Physiological responses to desert conditions.

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[This question paper contains 4 printed pages]

**Your Roll No.** : .....

**Sl. No. of Q. Paper** : **107** **I**

Unique Paper Code : 2232014801

Name of the Paper : DSC-20 : Comparative  
Physiology of Vertebrates  
(NEP-UGCF)

Name of the Course : **B.Sc.(H) Zoology/B.Sc.  
(P) Life Science**

Semester : **VIII**

**Time : 2 Hours** **Maximum Marks : 60**

**Instructions for Candidates :**

- (a) Write your Roll No. on the top immediately on receipt of this question paper.
- (b) Attempt **four** questions in all.
- (c) Draw neat labelled diagrams wherever necessary.

1. (a) Define the following terms (attempt any **five**): 5×1=5

- (i) Thermogenin
- (ii) Hypobaric hypoxia

- (iii) Hardware stomach
  - (iv) Root-effect hemoglobin.
  - (v) Ovoviviparity
  - (vi) Starvation
- (b) Differentiate between the following (attempt any **four**) :  $4 \times 2 = 8$
- (i) Starvation and Fasting
  - (ii) Osmoconformers and Osmoregulators
  - (iii) Gill and Parabronchial respiration
  - (iv) Autoenzymatic and Alloenzymatic Digestion
  - (v) Estrous and Menstrual Cycle
- (c) Expand the following (attempt any **two**) :  $2 \times 1 = 2$
- (i) HVR
  - (ii) BAT
  - (iii) HPG
- 2.** (a) Compare the mechanisms of thermoregulation in homeotherms and poikilotherms. Add a note on the role of various hormones and ion channels therein. 10

- (b) Describe the mechanisms of thermal regulation in desert animals. 5
- 3.** (a) Delineate the fine structure of the fish gill and the bird lung, and compare the functional similarity between them. 8
- (b) Examine the process of counter-current exchange of  $O_2$  and  $CO_2$  in fish and birds. 7
- 4.** (a) Discuss the challenges and physiological adaptations necessary for air and aquatic respiration. 8
- (b) Discuss the gradual shift in physiological fuels in response to chronic starvation in various vertebrates. 7
- 5.** (a) Explain the general mechanisms of Osmoregulation in animals. 5
- (b) Compare and contrast the challenges of osmoregulation among freshwater and marine vertebrates. 10