

**BZYCT-133**

**ASSIGNMENT BOOKLET**

**Bachelor's Degree Programme**

**(BSCG)**

**(COMPARATIVE ANATOMY AND DEVELOPMENTAL BIOLOGY  
OF VERTEBRATES)**

**Valid from 1<sup>st</sup> January, 2022 to 31<sup>st</sup> December, 2022**



**School of Sciences  
Indira Gandhi National Open University  
Maidan Garhi  
New Delhi-110068  
(2022)**

Dear Student,

Please read the section on assignments in the Programme Guide for Core Courses that we sent you after your enrolment. A weightage of 30 per cent, as you are aware, has been earmarked for continuous evaluation, **which would consist of one tutor-marked assignment** for this course. The assignment is in this booklet, and it consists of three parts, Part A, B and C. The total marks of all the parts are 100, of which 35% are needed to pass it.

### **Instructions for Formatting Your Assignments**

Before attempting the assignment please read the following instructions carefully:

- 1) On top of the first page of your answer sheet, please write the details exactly in the following format:

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**ROLL NO.:** .....

**NAME:** .....

**ADDRESS:** .....

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**COURSE CODE:** .....

**COURSE TITLE:** .....

**ASSIGNMENT NO.:** .....

**STUDY CENTRE:** ..... **DATE:** .....

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**PLEASE FOLLOW THE ABOVE FORMAT STRICTLY TO FACILITATE EVALUATION AND TO AVOID DELAY.**

- 2) Use only foolscap size writing paper (but not of very thin variety) for writing your answers.
- 3) Leave 4 cm margin on the left, top and bottom of your answer sheet.
- 4) Your answers should be precise.
- 5) Complete each of Part A, Part B and Part C of this assignment separately, and **submit them together**.
- 6) The assignment answer sheets are to be submitted to your Study Centre as per the schedule made by the study centre. **Answer sheets received after the due date shall not be accepted.**

**We strongly suggest that you retain a copy of your answer sheets.**

- 7) This assignment is **valid from 1<sup>st</sup> January, 2022 to 31<sup>st</sup> December, 2022**. If you have failed in this assignment or fail to submit it by 31<sup>st</sup> December, 2022, then you need to get the assignment for the year 2023, and submit it as per the instructions given in the Programme Guide.
- 8) **You cannot fill the exam form for this course** till you have submitted this assignment.

We wish you good luck.

**ASSIGNMENT**  
**COMPARATIVE ANATOMY AND DEVELOPMENTAL BIOLOGY**  
**OF VERTEBRATES**

Course Code: BZYCT-133  
Assignment Code: BZYCT-133/TMA/2022  
Maximum Marks: 100

**Note: Attempt all questions. The marks for each question are indicated against it.**

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**Part-A**

**Maximum Marks: 50**

1. i) Match the following: (5)  

i) Femoral glands	a) Birds
ii) Uropygial glands	b) Crocodiles
iii) Scent glands	c) Lizards
iv) Mammary glands	d) Eye lids of mammals
v) Meibomian glands	e) Female mammals
vi) Sebaceous glands	f) Mammals
- ii) Give *five* features that you can use to distinguish between the skulls of frog and rabbit. (5)
2. a) Describe the specializations found in ruminant stomachs. (5)  
b) What are the peculiar features of respiratory system of agnathans? (5)
3. a) Give short answers to the following: (5)  
  - i) What is the major modification that occurs in reptilian aortic arches?
  - ii) What is the role of ductus arteriosus in bird's circulatory system?
  - iii) How does right subclavian develop in mammals?
  - iv) Write one difference between somatic and visceral arteries.
  - v) What are precaval veins?  
b) Write short notes on: (5)  
  - i) Kidney blood circulation
  - ii) Types of mammalian uteri
4. i) Fill in the blanks: (5)  
  - a) In fishes the ..... covers the brain and spinal cord.
  - b) Reptiles and birds have a double membrane made up of ..... and ..... to protect the brain.
  - c) In lower vertebrates the epithalamus forms ..... and .....  
ii) How do bats prevent getting deaf from their high frequency calls? How do they get information about the immediate environment? (5)

5. Briefly write the functions of the following hormones secreted in mammals. (10)
- Adrenocorticotropic hormone
  - Parathormone
  - Aldosterone
  - Testosterone
  - Progesterone

**Part-B**

**Maximum Marks: 50**

6. List at least three stages in gene expression that can be regulated to result in differentiated cell types? Explain any one of them with the help of an example. (10)
7. i) a) How would you define a ligand in cell-to cell signalling? (6)  
       b) What is the difference between juxtacrine and paracrine signalling.  
       c) How is EMT used in the embryo and in the adult?  
 ii) What is a signal transduction pathway? Write out its steps in the order they would occur in a target cell. (4)
8. i) Choose the correct answer from alternatives provided. (5)  
       a) Fertilization is responsible for the activation/arrest of development.  
       b) Activation of the sperm ensures/does not ensure that sperm will meet the egg.  
       c) In organisms with external/internal fertilization, chemotactic mechanisms have been evolved to attract the sperm towards the egg.  
       d) A period of maturation in the female reproductive tract required for the transformation of sperm is known as activation/capacitation.  
       e) Sperm using an enzyme called acrosin/hyaluronidase penetrate their way through zona pellucida.
- ii) Fill in the blanks with suitable words. (5)  
       a) ..... is the extension of egg cytoplasm around the entering sperm head.  
       b) Inhibitor of microfilament formation such as ..... prevents the formation of fertilization cone.  
       c) The early response for the entry of sperm into the egg is prevention of .....  
       d) The ..... for polyspermy is mediated by the electrical depolarization of egg plasma membrane.  
       e) The slow block to polyspermy is achieved by ..... reaction.
9. i) Indicate the following changes that occur during metamorphosis in amphibians either as progressive or regressive or remodeling: (5)  
       a) The development of middle ear in connection with the pharyngeal pouch.  
       b) The change in the shape of the mouth and the shortening and reduction of the cloacal tube.

- c) Disappearance of lateral line organs of skin and reduction of blood vessels.
  - d) The differentiation of brain.
  - e) The changes in the portal system and the changes in the vascular system to supply blood to the lungs.
- ii) Name the organs derived from: (5)
- a) Dorsal mesoderm
  - b) Lateral plate mesoderm
10. i) What is the function of amniotic fluid? How are substances exchanged between the embryonic and maternal blood? (4)
- ii) Which common maternal diseases can lead to flaws in development? Explain. (6)