

Reg. No.:

Name:



Y8104

University of Kerala

Fourth Semester FYUGP Degree Examination, May 2026

Discipline Specific Core Course

ZOOLOGY

UK4DSCZOO203 - Comparative Anatomy of Vertebrates

Academic Level: 200-299

2024 Admission

Time: 2 Hours(120 Mins)

Max. Marks: 56

Part A. 6 Marks:Time 5 Minutes.(Cognitive Level :Remember(RE)/Understand(UN)) Objective Type.1 mark each, Answer all questions

Qn No.	Question	CL	CO
1	The furcula (wishbone) of birds is formed by fusion of: Options : A)The two coracoids only B)The two clavicles plus the interclavicle C)The scapulae and coracoids D)The sternum and both clavicles	RE	2
2	The notochord in adult bony fishes (teleosts) is: Options : A)Completely replaced by well-ossified vertebral centra, with no trace remaining B)Constricted within each centrum and expanded between centra (in the intervertebral spaces) C)Still the primary axial support with no vertebral centra D)Found only in the tail region	RE	2
3	In comparative anatomy, homoplasy refers to: Options : A)Structural similarity due to shared common ancestry B)Structural similarity due to convergent, parallel, or reversal evolution (Not shared ancestry) C)The retention of a primitive character in a derived group D)The loss of a structure during evolution	UN	1
4	During the contraction of a skeletal muscle, which band of the sarcomere shortens while the length of the myofilaments remains unchanged. Options : A)A band B)H zone C)I band D)Z line	UN	3
5	Muscles that cause movement at a joint by decreasing the angle between bones are called: Options : A)Extensors B)Flexors C)Abductors D)Rotators	UN	3
6	The connective tissue layer that surrounds an individual skeletal muscle fibre (myocyte) is called the: Options : A)Epimysium B)Perimysium C)Endomysium D)Aponeurosis	UN	4

Part B. 10 Marks:Time:20 Minutes (Cognitive Level:Understand(UN)/Apply(AP))Two-three sentences.2 marks each.Answer all questions

Qn No.	Question	CL	CO
7	Match the following		
	1. Axial Skeleton	A. provides a strong, stable connection for the lower/hind limbs.	
	2. Pectoral Girdle	b. is comprised of the appendages and the girdles that attach them.	
	3. Appendicular Skeleton	c. forms the main longitudinal axis of the body	
	4. Pelvic Girdle	d. supports the upper/front limbs	
8	Distinguish between an Evolutionary Grade and a Clade.	UN	1
9	Write a note on the structural principles of the chordate body plan	AP	3
10	Describe spiracle in sharks and its embryological identity?	AP	4
11	Generalize two ways in which comparative anatomy provides evidence for phylogenetic relationships among vertebrates.	AP	1

Part C. 16 Marks. Time: 35 Minutes. (Cognitive Level : Apply (AP) / Analyse (AN)) Short Answer. 4 marks each, Answer all 4 questions, choosing among options * within each question

Qn No.	Question	CL	CO
12	A) Apply the structural features of cardiac muscle to explain its continuous rhythmic function.	AP	3, 3
	OR B) Trace the evolution of the vertebrate heart from fish to mammals		
13	A) Explain the role of homologous organs in understanding phylogenetic relationships with an example	AP	1, 1
	OR B) How does comparative anatomy distinguish between convergent and divergent evolution?		
14	A) Assess how surface area and vascularization influence respiratory efficiency in vertebrates.	AN	4, 4
	OR B) Illustrate the evolutionary changes in respiratory structures from fishes to mammals.		
15	A) Analyse the bone structure in any two different vertebrate groups	AN	2, 2
	OR B) Examine the functional significance of regional differentiation in the vertebral column of mammals.		

Part D. 24 Marks. Time: 60 Minutes. (Cognitive Level :Analyse(AN)/Evaluate(EV)/Create(CR)) Long Answer 6 Marks each. Answer all 4 questions choosing among options * within each question

Qn No.	Question	CL	CO
16	A) Describe the hierarchical organisation of connective tissue in a skeletal muscle from the level of the individual muscle fibre to the tendon. Name each connective tissue layer, state what it surrounds, and explain how all these layers are structurally continuous with each other and with the tendon. Why is this continuity functionally essential? OR B) Compare the structural adaptations of skeletal, smooth and cardiac muscles of vertebrates	AN	3, 4
17	A) Assess the role of jaw suspension types in determining prey capture efficiency among fishes. OR B) Evaluate the evolutionary importance of the appendicular skeleton in the transition from aquatic fins to terrestrial limbs.	EV	2, 2
18	A) Assess the role of muscle structure in enabling efficient movement and locomotion in vertebrates. OR B) Explain the functional morphology of muscles in vertebrate locomotion and movement.	EV	3, 3
19	A) Prepare a note on the application and importance of comparative anatomy in biology. OR B) Create a comparative framework showing how vertebrate morphology reflects adaptation to aquatic, terrestrial, and aerial modes of life, using examples from major vertebrate groups.	CR	1, 1