



THE OPEN UNIVERSITY OF SRI LANKA
 B. Sc. DEGREE PROGRAMME – 2012/13

**ZLU2182 – ANIMAL DEVELOPMENT
 CAT 1 (NO BOOK TEST)**

DATE: 16th February 2013

Time: 11.00 a.m. – 12.00 noon

REGISTRATION NUMBER:

Answer all questions.

This paper consists of two parts, Part A & B.

Part A - Q 1 contains 20 multiple choice questions. Tick the correct answers for these questions on the answer sheet provided below.

Part B has two questions, Q 2 & Q3. Answers for these questions should be written on the space provided.

Submit the entire paper at the end of the examination.

Answer Sheet for Part A - Q 1

	(a)	(b)	(c)	(d)
1.1				
1.2				
1.3				
1.4				
1.5				
1.6				
1.7				
1.8				
1.9				
1.10				

	(a)	(b)	(c)	(d)
1.11				
1.12				
1.13				
1.14				
1.15				
1.16				
1.17				
1.18				
1.19				
1.20				

Registration No:

Part B

Q.2. This question is based on the spermatogenesis of vertebrates.

2.1 Illustrate the process of spermatogenesis using a suitable diagram.

2.2 State six events taking place in the process of spermatogenesis with their importance for the function of spermatozoa.

1.
.....

2.
3.
4.
5.
6.

(20 marks)

Q. 2 This question is based on the development of heart in frog embryo. Fill in the blanks choosing correct response from the words given within brackets.

During gastrulation, a mesoderm free triangle area retains in the gastrula, where the (brain/ nose/ mouth) is formed in frog. The base of this triangle lies (anteriorly/ dorsally/ posteriorly) in the embryo. The presumptive material of heart is present near the (apex/ middle/base) of the triangle, at the edges of the mesodermal mantle.

At the end of neurulation of the embryo, the free edges of the mesodermal mantle gradually (converge/ invaginate/ involute) towards the middle of the mesoderm free area and become thickened. Cells derived from this presumptive material of heart are positioned between the free edges of the mantle as loose (mesenchymal/ fibre/ endodermal) cells. These cells are the rudiments of the (epicardium/ mesocardium/endocardium) of heart. They arrange as a (longitudinal/ horizontal/ transverse) strand along the midline to develop into a thin-walled tube. The lumen of the tube is the cavity of the heart. The tube bifurcates at its both anterior and posterior ends. At the anterior end its' two prolongations are the (dorsal aortae/ ventral aortae/ vitelline arteries) and at the posterior end the two bifurcations receive the two (vitelline veins/ vitelline arteries/ cardinal veins).

While the tube is being formed, the remaining edges of the mesodermal mantle, which are actually the lateral plate mesoderm on either side, grow towards the midline and fuse with each other under the tube. Then the visceral layer of the lateral plate mesoderm moves around the tube and envelops it on dorsal side as well. The fusion of the right and left mesodermal layers beneath the endocardial tube forms the (dorsal/ lateral/ ventral) mesocardium of heart. When the visceral layers of the right and left sides meet and fuse above the tube, that fusion becomes the (dorsal/ lateral/ ventral) mesocardium. These mesocardia later dissolve making the coelomic cavity known as (pericardial/ mesocardial/ endocardial) cavity. This cavity, which was initially a part of the coelom, then becomes separated from it, by the fusion of the two layers of the lateral plate mesoderm. The visceral layer around the tube adheres to it and differentiates as muscle tissue giving rise to (epicardium/ mesocardium/ myocardium) of the heart.

The early developing heart is almost a straight tube and there are no chambers. As development proceeds the tube becomes bent in a very characteristic way, and assumes an 'S' shape. The tubular heart rudiment becomes constricted in some areas and dilated in others giving rise the four chambers. The (sinus venosus/ atrium/ conus arteriosus), which receives blood from the (vitelline veins/ cardinal veins/ common cardinal vein), is the most posterior chamber. The (sinus venosus/ atrium/ conus arteriosus) develops at the bend near to the (sinus venosus/ atrium/ conus arteriosus). The part between the two bends becomes the ventricle. The part going forward from the second bend or ventricle becomes the (sinus venosus/ atrium/ conus arteriosus), which will supply blood to (dorsal aortae/ ventral aortae/ vitelline arteries). All these chambers develop varying amounts of musculature in their walls by the development of myocardium. Finally, the peripheral cells layers of myocardium differentiate as an epithelial layer forming the (epicardium/ mesocardium/ myocardium) of the heart.

(20 marks)
