HALF YEARLY EXAMINATION -2017

11th BIO ZOOLOGY FULL ANSWER KEY

ONE MARKS

1. B) Phillipine goby

2. B) Microtome

3. B) Protien synthesis

4. B) Nervous tissue

5. B) Sylvius canal

6. D)0.33

7. B) Micro lecithal

8. A) Entamophagous

2 MARKS

9. The zygote assumes an elongated form and is capable of movement. It is known as **ookinete**.

10. a) BRCA 1- Breast and ovarian carcinoma

    b) Rb- Retinoblastoma

11. It is a ring of bones formed by the sacrum and paired bones called the **coxae** or **hip bones.**

12. The cortex is composed of smaller cells. These cells form three distinct layers, namely the **zona glomerulosa**, the **zona fasciculate** and the **zona reticularis**.

13. This mechanism is also known as arrhenotokus parthenogenesis. It is a common mechanism in several insects such as ants, bees andwasps. In these insects, fertilized eggs develop into diploid females and unfertilized egg into haploid males.

14. **Beeswax** is also a natural secretion of the worker bee from the glands located in the abdomen. It is used in the manufacture of cosmetics, face creams, paints, ointments, insulators, plastic works, polishes, carbon paper and many other lubricants.

3 MARKS

15. When a cell dies its own lysosomes release the enzymes that digest the remains of the cell in a process known as **autolysis**.

16. The endocrine part of the pancreas consists of **pancreatic islets**. They produce insulin and glucagon.

17. The presence of Rh^+ child in the uterus of the Rh^- mother can cause agglutination in the blood of the fetus. Even though such an unfortunate incident may not happen in the first pregnancy, it could occur in successive pregnancies. The death of the foetus in such cases is due to haemolytic anemia.This disease is called **erythroblastosis fetalis**.

18. **Laws of cleavage**
The cleavages are governed by certain basic principles or laws.
1. **Sach's laws** - These laws were proposed by Sach in 1877.
i) Cells tend to divide into equal daughter cells
ii) Each new division plane tends to intersect the preceding plane at right angles.
2. **Balfour's law** (Balfour 1885) - "The speed or rate of cleavage in any region of egg is inversely proportional to the amount of yolk it contains".

19. **Atolls** consist of a ring shaped reef, encircling a shallow lagoon which is connected to the outside by an opening. Hawaii and Carribian Islands are famous for Atolls.

5 MARKS

20. Plasma Membrane

It is the outer limiting membrane of both prokaryotic and eukaryotic cells. It is an ultra thin, elastic, living membrane. Plasma membrane is a dynamic and selective transport barrier.

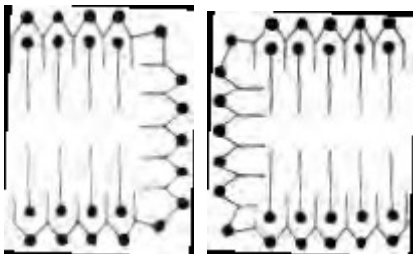
Since the plasma membrane is ultra thin, it could be observed only under electron microscope. Structure of the membrane is studied by isolating the same from the cell and conducting biochemical investigations.

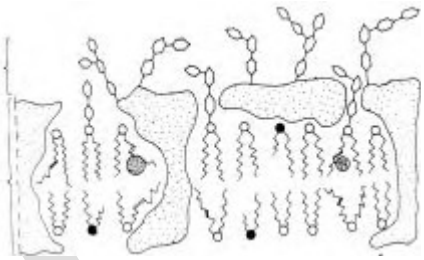
In 1895 **Overton** suggested that the membrane is made of fatty substances. Other workers later concluded that two layers of lipid were present in the cell membrane. According to a model proposed by **Danielli** and **Davson** in 1935, the **lipid bilayer** of the membrane was coated on either side with protein.

In 1960, **Robertson** using electronmicrographs proposed a **unit membrane hypothesis**. According to this hypothesis the two outer layers of **protein** are about 2 nm thick and appear densely granular. They enclose a clear central area of about 3.5 nm wide consisting of **lipids**. The lipids are mainly **phospholipid** molecules.

Singer and **Nicholson** (1972) have proposed a **fluid mosaic model** for the plasma membrane. The fluid mosaic membrane is a dynamic structure. In this structure much of the protein molecules float about. Some of them are anchored to the organelles within the cell. Lipid molecules also move about. 'Fluid mosaic model' is applied to all biological membranes in general.

The cell membrane controls the passage of materials both into and out of the cell. It regulates the passage of water and dissolved substances. Water passes through the membrane by **Osmosis**. Water soluble substances cross the membrane by **diffusion** or by **active transport**. Many water soluble solutes are transported by carrier proteins. Lipid soluble compounds pass more quickly by dissolving in the phospholipid layer.

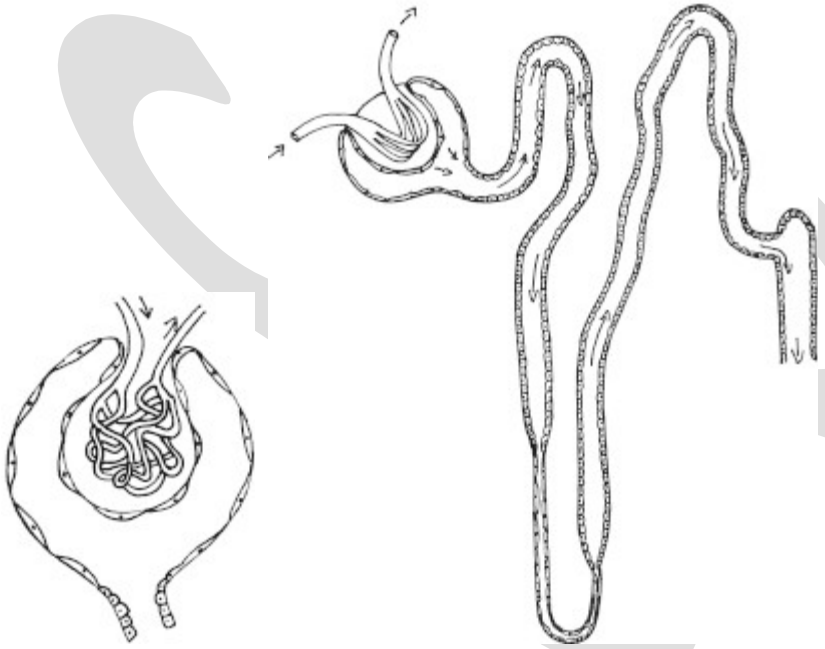




(or)

Nephron Structure

The basic functional unit of each kidney is the **nephron**. There are approximately 1.3 million nephrons in each kidney. Atleast 450,000 of them must remain functional to ensure survival. Each nephron consists of an enlarged terminal end called the **renal corpuscle,** a **proximal tubule**, a **loop** of **Henle** and a **distal tubule**. The distal tubule opens into a collecting duct. The renal corpuscle, proximal tubule and distal tubules are in the renal cortex. The collecting tubules and parts of the loops of Henle enter the renal medulla.



Most nephrons measure 50-55 mm in length. 15% of the nephrons are larger and they remain near the medulla. These are called the **juxtamedullary nephrons**. They have larger loops of Henle.

The renal corpuscle of the nephron consists of a **Bowman's capsule** and a bunch of capillaries called the **glomerulus**.

In the Bowman's capsule the outer and inner layers are called **parietal** and **visceral layers** respectively. The outer parietal layer is composed of simple squamous epithelium. The inner visceral layer surrounds the glomerulus.

It consists of specialized cells called **podocytes**. The walls of the glomerular capillaries are lined with endothelial cells. There is a basement membrane between the endothelial cells of the glomerular capillaries and the podocytes of Bowman's capsule. The capillary endothelium, the basement
membrane and the podocytes of Bowman's capsule make up the **filtration membrane**.

The glomerulus is supplied with blood by an afferent arteriole. It is drained by an efferent arteriole.The cavity of Bowman's capsule opens into the proximal tubule. The proximal tubule is also called the **proximal convoluted tubule**. It is approximately 14mm long and 60 µm in diameter.

Posteriorly the proximal tubule continues as the **loop of Henle**. Each loop has a descending limb and an ascending limb. The first part of the descending limb is similar in structure to the proximal tubule. The loops of Henle that extend into the medulla become very thin near the end of the loop. The first part of the ascending limb is also very thin and it consists of simple squamous epithelium, but it soon becoms thick. The distal tubules, also called the distal convoluted tubules are not as long as the proximal tubules.

21. **ABO blood groups in human beings**

The ABO blood group system in human beings was established by K. Landsteiner. It is based on the presence or absence of certain antigens. There can be two anitigens A or B in the blood, resulting in four blood groups, namely A,B, AB and O. These are called **ABO blood groups** or **Landsteiner blood**
groups.

The inheritance of ABO system illustrates a new principle in genetic control of phenotypes.

The blood of a person having A group will have the antigen A and a person having B group will have the antigen B. With these antigens A and B there are certain naturally occurrring antibodies in the serum of the blood. The antibodies in a particular individual will be found only for those antigens which
are absent in blood of this individual. The presence of antigens and antibodies occur as follows

Blood groups	**Antigen**	**Antibody in the serum**
A	A	anti B
B	B	anti A
AB	A and B	None
O	None	anti A and B

Antibodies in the blood of 'group **A**' will agglutinize red blood corpuscles of the blood group **B**. Similarly the antibody in blood 'group **B**' will agglutinize red blood corpuscles of the blood group **A**. Since no antibody is found in 'group **AB**' blood, it will not agglutinize any other group . 'Group **O**' will have antibodies for 'group **A**' and **B**. Hence 'group **O**' will agglitinize group **A** and **B**. Compatibility of donor blood to that of the recipient will occur as follows.

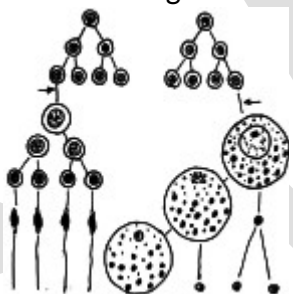
Blood group of the donor	**Blood group of the recipient**
A	**A**and **AB**
B	**B** and **AB**
AB	**AB**
O	**O**, **A**, **B, AB**

From the table provided it is obvious that 'group **AB**' is **universal recipient**. 'Group **O**' is **universal donor**.

(or

Gametogenesis :

The process of embryonic development in sexually reproducing multicellular organisms is made possible through processes of **gametogenesis** and **fertilization**. Gametogenesis is the formation of **sex cells** or **reproductive cells** or **gametes**. It happens in primary sex organs called **gonads**. The male and female gonads, namely the testis and ovary contain **primordial germ cells**. These cells are responsible for the production of gametes.



Spermatogenesis :

In the testis of vertebrates the specialised tissue for the process of spermatogenesis are located in the **seminiferous tubules**. The primordial germ cells of these tubules produce cells which ultimately become **sperm mother cells** or spermatogonia. Through a growth phase the speramtogonia get converted into **primary spermatocytes**. These are diploid cells. They undergo meiotic cell division. Initially the I Meiosis results in the formation of **secondary spermatocytes**. Through II Meiosis they form **spermatids**. The spermatids are haploid in nature. By a process of **spermiogenesis** or **spermioteliosis** they get differentiated into specialized cells called **spermatozoa**.

Oogenesis :

A similar process happens inside the female gonad, namely the **ovary** for the production of **Ova**. This process that happens in the primordial germ cell of the ovary passes through stages of primary **oogonia**, **primary oocyte** and s**econdary oocyte**. These stages are conducted by meiotic cell divisions. Thus the final product, namely the **ovum** is a haploid female reproductive cell.