BK BIRLA CENTRE FOR EDUCATION

SARALA BIRLA GROUP OF SCHOOLS
SENIOR SECONDARY CO-ED DAY CUM BOYS' RESIDENTIAL SCHOO
POST MID TERM EXAMINATION 2024-25
CLASS-XI
BIOLOGY MARKING SCHEME (044)

Section A

1. (b) Antigen-antibody reaction 1
2. (b) Vasopressin 1
3. C. A is true but R is false.

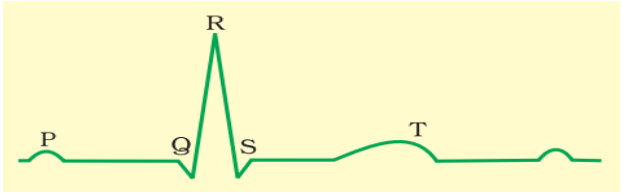
Section B

4. a) The first heart sound (lub) is associated with the closure of the tricuspid and bicuspid valves whereas the second heart sound (dub) is associated with the closure of the semilunar valves. These sounds are of clinical diagnostic significance. 1+1

b) Fibrinogens are needed for clotting or coagulation of blood. Globulins primarly are involved in defense mechanisms of the body and the albumins help in osmotic balance.

5.a) DCT- The ascending limb continues as another highly coiled tubular region called distal convoluted tubule (DCT). and PCT- The tubule continues further to form a highly coiled network – proximal convoluted tubule.

b) Flame cells- the excretory structures in Platyhelminthes (Flatworms, e.g., *Planaria*), rotifers, some annelids and Green glands- perform the excretory function in crustaceans like prawns. 1+1

6. 

1+1

The P-wave represents the electrical excitation (or depolarisation) of the atria, which leads to the contraction of both the atria.
The QRS complex represents the depolarisation of the ventricles, which initiates the ventricular contraction. The contraction starts shortly after Q and marks the beginning of the systole.
The T-wave represents the return of the ventricles from excited to normal state (repolarisation). The end of the T-wave marks the end of systole.

7. Kidneys do not play any significant role in the removal of ammonia. Terrestrial adaptation necessitated the production of lesser toxic nitrogenous wastes like urea and uric acid for conservation of water. 2
8. The contraction of smooth muscles of the bladder and simultaneous relaxation of the urethral sphincter causing the release of urine. The process of release of urine is called micturition. 2

OR

The amount of the filtrate formed by the kidneys per minute is called glomerular filtration rate (GFR). GFR in a healthy individual is approximately 125 ml/minute.

Section C

9. The JGA plays a complex regulatory role. A fall in glomerular blood flow/glomerular blood pressure/GFR can activate the JG cells to release renin which converts angiotensinogen in blood to angiotensin I and further to angiotensin II. Angiotensin II, being a powerful vasoconstrictor, increases the glomerular blood pressure and thereby GFR. 3
10. Liver, the largest gland in our body, secretes bile-containing substances like bilirubin, biliverdin, cholesterol, degraded steroid hormones, vitamins and drugs.
Lungs remove large amounts of CO_2 (approximately 200mL/ minute) and also significant quantities of water every day.

Sweat produced by the sweat glands is a watery fluid containing NaCl, small amounts of urea, lactic acid, etc. in excretion. 3

11. The deoxygenated blood pumped into the pulmonary artery is passed on to the lungs from where the oxygenated blood is carried by the pulmonary veins into the left atrium. This pathway constitutes the pulmonary circulation.
The oxygenated blood entering the aorta is carried by a network of arteries, arterioles and capillaries to the tissues from where the deoxygenated blood is collected by a system of venules, veins and vena cava and emptied into the right atrium. This is the systemic circulation.It provides nutrients, O_2 and other essential substances to the tissues and takes CO_2 and other harmful substances away for elimination. 3

12.i) complex organisms use special fluids within their bodies to transport such materials. Blood is the most commonly used body fluid by most of the higher organisms including humans for this purpose.
ii) The SAN can generate the maximum number of action potentials, i.e., 70-75 min^{-1}, and is responsible for initiating and maintaining the rhythmic contractile activity of the heart. Therefore, it is called the pacemaker.
iii) The heart's myogenic nature is due to the sinoatrial (SA) node, a modified muscular tissue in the right atrium that initiates the heartbeat. 1+1+1

OR

iii) Fishes have a 2-chambered heart with an atrium and a ventricle. Blood can mix and they don’t maintain constant body temperature.