**BLOG WORKSHEET**

**BIOLOGY CLASS 10**

Teacher Name: Uzma Amer Class: 10 Subject: Biology Date: 4th Nov’17

**Q.1.Choose the best answers:**

**1. Reabsorption of useful substances from glomerular filtrate occurs in**

(a) collecting tube

 (b) loop of Henle

(c) proximal convoluted tubule

(d) distal convoluted tubule.

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**Answer and Explanation:**

**1. (c):** The cells lining the proximal convoluted tubule are well adapted for reabsorption of materials from the filtrate. They have abundant mitochondria and bear numerous microvilli on the free side. Mitochondria power the active transport of nutrient molecules back into the blood. The cells reabsorb entire glucose, amino acids, most of the inorganic ions (Na+, K+, Cl~), much of the water as well as some urea from the filtrate.

**2. Under normal conditions which one is completely reabsorbed in the renal tubule?**

(a) urea

(b) uric acid

(c) salts

(d) glucose.

**Answer and Explanation:**

**2. (d):** The cells lining the proximal convoluted tubule are well adapted for reabsorption of materials from the filtrate. They have abundant mitochondria and bear numerous microvilli on the free side thus giving brush border appearance. The cells reabsorb entire glucose, amino acids, most of the inorganic ions, much of the water as well as some urea from the filtrate.

**3. Nitrogenous waste products are eliminated mainly as**

(a) urea in tadpole and ammonia in adult frog

(b) ammonia in tadpole and urea in adult frog

(c) urea in both tadpole and adult frog

(d) urea in tadpole and uric acid in adult frog.

**Answer and Explanation:**

**3. (b):** Ammonia is highly soluble in water, so in aquatic animals e.g., tadpoles of frog, the nitrogenous waste products are excreted in the form of ammonia. In terrestrial animals e.g., adult frog, these wastes are excreted in the form of urea.

**4. Glucose is taken back from glomerular filtrate through**

(a) active transport

(b) passive transport

(c) osmosis

(d) diffusion.

**Answer and Explanation:**

**4. (a):** Glucose is taken back from the glomerular filtrate by the proximal convoluted tubule by active transport.

**5. If excess water passes out from the tissue without being restored by the kidneys, the cells would**

(a) burst open and die

(b) take water from the plasma

(c) not be affected at all

(d) shrivel and die.

**Answer and Explanation:**

**5. (c):** Individual cells have no role to play in this process. Excess water in the blood affects the osmoreceptors present in hypothalamus and volume receptors present in left atrium, ventricles and pulmonary veins. This causes ADH release so that body hydration is regulated by removal of excess water by kidney.

**6. A red blood cell was kept in a solution for a few minutes, where it got burst. The solution taken was**

(a) hypotonic

(b) concentrated sugar solution

(c) isotonic

(d) hypertonic.

**Answer and Explanation:**

**6. (a):** A cell gains water if it is kept in hypotonic solution or pure water. The phenomenon is called endosmosis. If the red blood cells are placed in a hypotonic solution, one in which the concentration of solutes is less and concentration of water is greater than inside the cells, they will take up water by endosmosis to equalize the water concentration, swell up and may burst.

The swelling cells protoplast exerts pressure on the surrounding cell membrane or wall if present. It is called hydrostatic pressure or turgor pressure. Animal cells do not have a wall; therefore high turgor pressure causes their bursting.

**7. The basic functional unit of human kidney is**

(a) nephridia

(b) Henle’s loop

(c) nephron

(d) pyramid.

**Answer and Explanation:**

**7. (c):** A nephron is a unit of structure and function in a kidney. A kidney contains about a million nephrons, each approximately 3 cm. long.

A nephron is a long tubule differentiated into four regions having different anatomical features and physiological role: Bowman’s capsule, proximal convoluted tubule (PCT), loop of Henle, and distal convoluted tubule (DCT). The latter opens into one of the collecting ducts. Nephridia are the excretory organs of annelids.

**8. A condition of failure of kidney to form urine is called**

(a) anuria

(b) deamination

(c) uremia

(d ) none of these.

**Answer and Explanation:**

**8. (a):** Anuria is the complete suppression of urine formation by the kidney. In this case most of the nephrons are destroyed. Uremia is the presence of an excessive amount of urea in the blood. Deamination is the removal of ammonia from amino acids.

**9. Concentration of urine depends upon which organ?**

(a) Bowman’s capsule

(b) length of Henle’s loop

(c) P.C.T.

(d) network of capillaries arising from glomerulus.

**Answer and Explanation:**

**9. (b):** Concentration of urine depends upon the length of Henle’s loop. Loop of Henle is the hairpin shaped section of a kidney tubule situated between the proximal and distal tubules in the nephron. It consists of a thin descending limb which is permeable to water and a thick ascending limb which is impermeable to water complex movements of ions and water across the walls of the loop enable it to function as a countercurrent multiplier, resulting in the production of concentrated urine in the collecting duct.

**10. Conversion of ammonia to urea is done by**

(a) ornithine cycle

(b) arginine cycle

(c) fumaric cycle

(d) citrulline cycle.

**Answer and Explanation:**

**10. (a):** Refer answer 11.

**11. If Henle’s loop were absent from mammalian nephron, which one of the following is to be expected?**

(a) there will be no urine formation

(b) there will be hardly any change in the quality and quantity of urine formed

(c) the urine will be more concentrated

(d) the urine will be more dilute

**12. The net pressure gradient that causes the fluid to filter out of the glomeruli into the capsule is**

(a) 50 mm Hg

(b) 75 mm Hg

(c) 20 mm Hg

(d) 30 mm Hg.

**Answer and Explanation:**

**12. (c):** Walls of glomerular capillaries and Bowman’s capsule are very thin and are semipermeable due to the presence of pores in the former and slit-pores in the latter. They allow water and small molecules in the blood to pass through them. Fluid containing these materials is forced out of the glomerular capillaries into the Bowman’s capsule by the high pressure of the blood in the glomerular capillaries.

This pressure is about 70 mm. Hg in man. The fluid tends to move in the reverse direction due to (i) the osmotic pressure of plasma proteins in the glomerular capillaries, and (ii) hydrostatic pressure of the fluid in the urinary tubule. These pressures in man are about 30 mm. Hg. and 20 mm. Hg. respectively. The net force moving the fluid from the glomerular capillaries, called the filtration pressure, is 70 – (30 + 20) or 20 mm. Hg.

**13. A person who is on a long hunger strike and is surviving only on water, will have**

(a) less amino acids in his urine

(b) more glucose in his blood

(c) less urea in his urine

(d) more sodium in his urine.

**Answer and Explanation:**

**13. (c):** A person who is on a long hunger strike and is surviving only on water, will have less urea in his urine. Urea, also called carbamide, is an organic chemical compound which essentially is the waste produced when the body metabolizes protein. Manufactured in the liver, by broken down protein or amino acids, and ammonia, the kidneys transfer urea from the blood to the urine.

The average person excretes about 30 grams of urea a day. During total starvation with no food being eaten, the body must rely on its own tissues to provide the essential mixture of fuels to sustain life. The primary fuel is stored fat but we also need a continuous supply of glucose. The body has a very small store of glycogen that can provide glucose for about 36 hours, then the body must make its glucose.

The body has three sources of glucose, one is the diet (but the person is starving), a second is glycogen (but this is all gone) and the third is a process called gluconeogenesis where the body makes glucose from amino acids.

During starvation, the body must rely on body proteins for the amino acids. On high-protein diets the carbon skeletons of the amino acids are oxidized for energy or stored as fat and glycogen, but the amino nitrogen must be excreted. To facilitate this process, enzymes of the urea cycle are controlled at the gene level.

When dietary proteins increase significantly, enzyme concentrations rise. On return to a balanced diet, enzyme levels decline. Under conditions of starvation, enzyme levels rise as proteins are degraded and amino acid carbon skeletons are used to provide energy, thus increasing the quantity of nitrogen that must be excreted in the form of urea.

**15 Under normal conditions which one is completely reabsorbed in the renal tubule?**

(a) urea

(b) uric acid

(c) salts

(d) glucose.

16. Kidneys do not help in

1. osmoregulation
2. maintaining body temperature
3. maintaining composition of blood plasma
4. regulation of blood pH

17.Cortex contains cuplike structures called as

1. loop of Henle'
2. Renal capsule
3. Bowmans capsule
4. Glomerulus capsule

18.Anabolic activities include

1. tissue respiration
2. deamination of proteins
3. denaturation of enzymes
4. photosynthesis in green plants

19.Osmoregulators refers to

1. regulating salt concentration in blood
2. regulating water concentration in blood
3. regulating mineral concentration in blood
4. both A and B

20.Kidney tubules are also called as

1. collecting tubules
2. renal pelvis
3. ureter
4. nephrons

21.Renal artery, renal vein and nerves are connected at

1. ureters
2. urethra
3. hilus
4. medulla