Practice Question Set For A-Level
Subject : Biology
Paper-2 Topic: 6 Organisms Response To Their Environment

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Name of the Student:_____
Max. Marks : 25 Marks **Time : 25 Minutes**

Mark Schemes

Q1.

1. SAN initiates heartbeat / acts as a pacemaker / myogenic;
   Q *Must be in context*

2. (SAN) sends wave of electrical activity / impulses (across atria) causing atrial contraction;
   Reject: signals / electronic / messages / nerve impulses once only

3. AVN delays (electrical activity / impulses);
   Neutral: reference to non-conducting tissue delaying impulses instead of the AVN

4. (Allowing) atria to empty before ventricles contract / ventricles to fill before they contract;

5. (AVN) sends wave of electrical activity / impulses down Bundle of His / Purkyne fibres;

6. (Causing) ventricles to contract (from base up) / ventricular systole;

5 max

[5]

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Q2.

(a) Hydrostatic pressure / description of pressure / description of how pressure generated;
Causes ultrafiltration (*Allow description of ultrafiltration*) at Bowman's capsule / glomeruli / renal capsule;
Through basement membrane;
Enabled by small size urea molecule;

2 max

(b) Reabsorption of water / by osmosis;
At the PCT / descending LoH;
At the DCT / CD;
Active transport of ions / glucose creates gradient (in context);

Ignore references to facilitated diffusion or to selective reabsorption.

3 max

[5]

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Q3.

(a) 1. Blood pressure / hydrostatic pressure;
2. Small molecules / named example;
3. Pass through basement membrane / basement membrane acts as filter;
4. Protein too large to go through / large so stays behind;
5. Presence of pores in capillaries / presence of podocytes;

5

(b) 1. High concentration of glucose in blood;
2. High concentration in tubule / in filtrate;
3. Reabsorbed by facilitated diffusion / active transport;
4. Requires proteins / carriers;
5. These are working at maximum rate / are saturated;
6. Not all glucose is reabsorbed / some is lost in urine;

4 max

(c) For general principle, applied to either example:

1. More water (from filtrate) reabsorbed / returned to blood / less lost in urine;
2. By osmosis;
3. From collecting duct / from end of second convoluted tubule;
4. Due to longer loop of Henle;

For loop of Henle, maximum 2 marks:

5. Sodium / chloride ions absorbed from filtrate in ascending limb;
6. Gradient established in medulla / concentration of ions increases down medulla;

For ADH, maximum 2 marks:

7. Acts on collecting duct / distal convoluted tubule / second convoluted tubule;
8. Makes cells more permeable / inserts aquaporins in plasma membranes;

Note: to score full marks, candidates must make one specific statement about Loop of Henle and one about ADH.

6 max

[15]

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