**Q 2016 8**

1. Answer the following question in relation to the human pulse.
2. What is the pulse?
3. What makes the wrist (or temple, or neck) a suitable part of the body to detect a pulse.
4. Answer the following questions in relation to the investigation you carried out on the effect of exercise on the breathing rate or pulse rate.
   1. What was the control in this investigation?
   2. What was the purpose of this control?
   3. You carried out this investigation on two women of the same age. One of the women (A) was a very fit athlete. The other (B) was overweight and rarely took exercise.
      1. Appropriate label axis below
      2. Draw two curves or plots to summarise the most likely results of your investigation, clearly labelling which curve relates to which individual.
   4. Recovery time is the duration of the period following exercise during which the breathing rate or pulse rate returns to normal. Suggest how you might measure recovery time.

**MS 2016 8**

1. I. The (rhythmic) stretching (or expanding or vibrating) of an artery 3

II. Artery near the surface 3

(b)

* 1. Control: Rate (measured) at rest
  2. Purpose of this control: To compare with the results (of the experiment)
  3. Axis labels: x-axis ‘duration (of exercise) or ‘time’ or ‘level of exercise’

y-axis ‘rate’

Curve showing: B increases by a greater amount

* 1. Recovery time: Immediately (after exercise)/ count pulse or breathing/ rate pr per minute/ measure length of time until resting rate reached.

**Q 2016 15**

1. (i) Draw a labelled diagram of a transverse section and a labelled diagram of a longitudinal section through a human vein to show its structure.

(ii) In each of the following cases name a vein which fits the description.

* + - 1. Transports blood out of the muscle of the heart
      2. Brings blood away from the kidneys
      3. Carries very little carbon dioxide
      4. Brings blood to the right atrium.
      5. Has capillaries at both ends.

(iii) Briefly describe how blood is moved through veins

**MS 2016 15**

1. (i) T.S. vein thin wall +large lumen (>50% total diameter)

L.S. vein clearly longitudinal + valve

Labels: lumen/muscle or wall or endothelium/ valve

(ii) 1. Heart Muscle: Cardiac or coronary (vein)

2. Kidney: Renal (vein)

3. Little CO2: Pulmonary vein

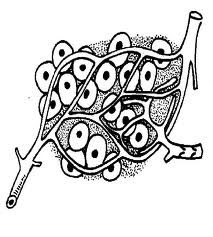
4. Into R.A.: Vena Cava

5. Capillaries at both ends: Hepatic portal (vein)

(iii) (skeletal or voluntary) muscles contracting (squeezing)/Valves prevent backflow

**Q 2014 3**

The diagram shows a region of tissue that includes body cells and parts of the circulatory and lymphatic systems.



Direction of blood flow

Body Cells

A

C

B

1. Name part C.
2. What type of blood vessel is A?
3. If a transverse section of A were viewed under the microscope state one way in which it would differ from a transverse section through B.
4. Give two functions of the lymphatic system.
5. Give one way in which lymph differs from blood.
6. Name a major blood vessel that returns the blood in B to the heart.

**MS 2014 3**

|  |  |
| --- | --- |
| 3. | 8 + 7 + 5(1) |
| (a) | C = Lymph vessel |
| (b) | Arteriole [*accept* artery] |
| (c) | Narrow(er) lumen or thick(er) wall or no valves |
| (d) | Maintains a constant level of ECF or drains fluid or returns fluid to blood / manufacture of |
|  | lymphocytes or maturation of lymphocytes / filtering bacteria / fighting infection / |
|  | transport of named material |
| (e) | No red blood cells or no haemoglobin / no platelets / no clotting (proteins) / |
|  | higher fat level [*accept* correct colour difference] |
| (f) | Vena cava |

**Q 2014 9**

Answer the following in relation to investigations that you carried out in the laboratory.

1. 1. When dissecting a mammalian heart where, precisely, did you locate the tricuspid valve?

2. Briefly describe how you carried out the dissection to expose this valve.

3. Where did you find the semilunar valves during the dissection?

(ii) 1. When you investigated the effect of exercise on the human pulse rate or breathing rate what did you first establish?

2. How did you measure pulse rate or breathing rate?

**MS 2014 9**

(b) (i) 1. Between the right atrium and right ventricle 3

2. Cut through the right side of the heart/using a scalpel 2(3)

3. At the base/ of the aorta or the pulmonary artery 2(3)

(ii) 1. The resting (pulse) rate or resting (breathing) rate 3

2. Feel (or locate) pulse (or observe breathing)/ Count heart beats (or breaths) for stated time/ repeat and find average. 2(3)

**Q 2012 15B**

1. State two ways, other than colour, in which red blood cells differ from white blood cells.
2. Name a group of white blood cells, other than lymphocytes.
3. Lymphocytes may be divided into B cells and T cells. B cells produce antibodies.
   1. What is the role of antibodies in the body?
   2. Name any three types of T cell.
   3. State a role of each of the T cell types that you named in part 2.

**MS 2012 15B**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1. 15. (b) | (i) | Smaller / more of them / biconcave / disc (shape) / no nucleus (when mature)  / no mitochondria / transport oxygen / contain haemoglobin / transport CO2 | | 2(3) |
| (ii) Phagocytic (white cells) or monocytes | | | | 3 |
|  | (iii) | 1. To inactivate antigens (or described) | | 3 |
|  |  | 2. Helper / killer / suppressor / memory | *Any three* | 3(3) |
| 3.  *Helper:* recognise antigens or secrete interferon or stimulate B-cell (or antibody production) or activate killer cell  *Killer:* attack infected cells or secrete perforin  *Suppressor:* stop immune responses  *Memory:* long term protection or remember antigens (to which they have been exposed) or explained  *Any three* | | | | 3(3) |

**Q 2010 7**

(a) (i) Name the cavity of the body in which the heart and lungs are located

(ii) State one way in which heart muscle differs from other muscles in the body

(b) Answer the following questions in relation to a dissection that you carried out to investigate the structure of an ox’s or a sheep’s heart.

1. Describe the steps that you followed in order to identify and display the inner structures of the heart. Use suitably labelled diagrams if necessary.
2. What did you do in order to expose a semi-lunar valve?
3. In the space below draw and label sufficient of your dissection to show the tricuspid valve, the right atrium and the right ventricle.

**MS 2010 7**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 7. | (a) | (i)  (ii) | Thoracic or chest  Doesn’t tire [*allow involuntary*] | 3  3 |
|  | (b) | (i) | Identify front (or back or left or right) / how identified / named cutting instrument / location of first cut / second cut described / locate (find or flag label) named structure / safety precaution described  (*any of the above points can be got from labelled diagrams*) | 4(3) |
|  |  | (ii) | Cut open aorta or cut open pulmonary artery | 3 |
|  |  | (iii) | Diagram of dissection | 3, 0 |
|  |  |  | Labels: Right atrium, tricuspid valve, right ventricle | 3(2) |

**Q 2009 13**

(a) The human circulatory system has two circuits.

* 1. Give the name of each of these circuits.
  2. Which of these circuits involves the pumping of blood by the left ventricle? (9)

1. (i) Write a short note on each of the following:
   1. Pulse.
   2. Blood pressure.
2. Comment on the effect of each of the following on the circulatory system:
   1. Diet.
   2. Exercise.
3. Give two ways, other than colour, in which a red blood cell differs in structure or composition from a typical body cell such as one in the cheek lining.
4. What is the role of the SA (sinoatrial) and AV (atrioventricular) nodes in the heart?
5. Give the precise locations of both the SA and the AV nodes in the heart.

**Q 2009 13**

#### (27)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 13. | (a) | (i) | Pulmonary circuit | 3 |
|  |  |  | Systemic circuit | 3 |
|  |  | (ii) | Systemic or described | 3 |
|  |  |  |  |  |
|  | (b) | (i) | 1. Pulse: contraction of (wall of) artery or expansion of   artery or due to pumping of heart (or of left ventricle) or rate at which heart beats [*accept* relevant medical reference]   1. Blood pressure: Force exerted by blood (or by heart)   [*accept* relevant medical reference] |  |
|  |  | 3 |
|  |  | 3 |
|  |  | (ii) | 1. Comment on diet: Dietary factor + matching effect | 3 |
|  | 2. Comment on exercise: Comment + matching effect | 3 |
|  |  | (iii) | Contain haemoglobin / no nucleus (or other named organelle) / comment on shape | 2(3) |
|  |  | (iv) | Causes contraction (of heart muscle) or Pacemaker (or described) or  impulse generation | 3 |
|  |  | (v) | *SA* (In wall of) right atrium or indicated on diagram  *AV* In (or near) septum or near tricuspid valve or between atrium and ventricle or indicated accurately on diagram | 3 |
|  | 3 |
|  |  |  |  |  |

**Q 2007 13**

(a) (i) Name the blood vessel that returns blood to the heart from the lungs.

(ii) Name the main gas transported in the blood vessel that you have named in (i).

How is this gas transported?

(9)

MS **2007 13**

(i) Pulmonary Vein

(ii) Oxygen

Haemoglobin/Iron

**Q 2006 13**

(a) (i) State a precise location in the human body at which red blood cells are made.

(ii) State two ways in which red blood cells differ from typical body cells e.g. from

the cheek lining. (9)

(b) Use your knowledge of the human vascular and excretory systems to answer the following.

1. Explain the terms, plasma, glomerular filtrate.
2. Explain why red blood cells are normally absent from glomerular filtrate.
3. The concentration of glucose is the same in plasma and glomerular filtrate. Why is this?
4. Why is glucose normally absent from urine?
5. Following a period of heavy exercise an athlete may produce only a small volume of concentrated urine. Explain this observation and give an account of the process that concentrates the urine

(c) (i) Describe the structure of the lymphatic system.

(ii) Give an account of three functions of the lymphatic system.

**MS 2006 13**

(a) (i) marrow or named bone e.g. skull/ribs/long bones/sternum 3

(ii) no nucleus / haemoglobin / shape comment/ size comment /no mitochondria / carries oxygen or CO2 *any two* 2(3)

(b) I. *plasma*: liquid part of blood 3

*glomerular filtrate:* (plasma) that has entered Bowman’s capsule or has left the glomerulus or plasma less proteins 3

II. too big (to pass into Bowman’s capsule) 3

III. (glucose) small or passes through 3

IV. reabsorbed or explained 3

V. sweating or water loss or dehydration / blood volume drops or concentration increases /detected by receptors / brain alerted / ADH secreted / from pituitary / (stimulates) reabsorption of water/in distal tubule or collecting duct *any four* 4(3)

(c) (i) (lymph) nodes / (lymph) vessels 2(3)

(ii) transport / defence / fluid collection / (transport) of fats /(transport) of hormones / (transport) of excretory matter / nodes filter / bacteria or pathogens / produce lymphocytes or antibodies

returns fluid to blood / absorbs fat / at lacteals / *any six* 6(3

**Q 2004 9**

1. (i) Cardiac muscle may be described as a contractile tissue. Explain the meaning of the underlined term.

(ii) Which chamber of the heart has the greatest amount of muscle in its wall?

1. (i) Describe how you dissected a mammalian heart in order to investigate the internal structure of atria and ventricles.

Draw a labelled diagram of your dissection to show the location and structure of the bicuspid and tricuspid valves.

State the procedure that you followed to expose a semilunar valve.

What is the function of a semilunar valve?

Where in your dissection did you find the origin of the coronary artery

**MS 2004 9**

1. (i) it can shorten or contract 3

(ii) left ventricle 3

## Dissection: Identify sides (or front/back) / how identified / ventral side uppermost /

on board or dish /named cutting instrument / described (location of) cut /any safety procedure stated e.g gloves, goggles, white coat *any three* 3(3)

## Diagram: 3, 0

[*4 chambers + indication of 2 valves*] labels (bicuspid and tricuspid valves in correct position) 3 Expose semilunar valve: Cut aorta or cut pulmonary artery 3

Function semi lunar valve: Stops back flow of blood (into ventricle or from artery) 3

Origin of coronary artery: aorta or near semilunar valve