

Insert School Logo

Semester One Examination 2022 Question/Answer booklet

HUMAN BIOLOGY UNIT 1

SOLUTIONS

Time allowed for this paper

Reading time before commencing work: ten minutes
Working time: three hours

Materials required/recommended for this paper

To be provided by the supervisor

This Question/Answer booklet
Multiple-choice answer sheet

To be provided by the candidate

Standard items: pens (blue/black preferred), pencils (including coloured), sharpener, correction fluid/tape, eraser, ruler, highlighters

Special items: up to three calculators, which do not have the capacity to create or store programmes or text, are permitted in this ATAR course examination

Important notice to candidates

No other items may be taken into the examination room. It is **your** responsibility to ensure that you do not have any unauthorised material. If you have any unauthorised material with you, hand it to the supervisor **before** reading any further.

Structure of this paper

Section	Number of questions available	Number of questions to be answered	Suggested working time (minutes)	Marks available	Percentage of examination
Section One Multiple-choice	30	30	40	30	30
Section Two Short answer	8	8	90	107	50
Section Three: Extended Answer	2	1	50	20	10
	2	1		20	10
Total				177	100

Instructions to candidates

- The rules for the conduct of Western Australian external examinations are detailed in the *Year 12 Information Handbook 2022: Part II Examinations*. Sitting this examination implies that you agree to abide by these rules.
- Write your answers in this Question/Answer booklet preferably using a blue/black pen. Do not use erasable or gel pens.
- Answer the questions according to the following instructions.

Section One: Answer all questions on the separate Multiple-choice answer sheet provided. For each question, shade the box to indicate your answer. Use only a blue or black pen to shade the boxes. Do not use erasable or gel pens. If you make a mistake, place a cross through that square, then shade your new answer. Do not erase or use correction fluid/tape. Marks will not be deducted for incorrect answers. No marks will be given if more than one answer is completed for any question.

Section Two: Write your answers in this Question/Answer booklet. Wherever possible, confine your answers to the line spaces provided.

Section Three: Consists of two parts each with two questions. You must answer one question from each part. Tick the box next to the question you are answering. Write your answers in this Question/Answer booklet.

- You must be careful to confine your responses to the specific questions asked and follow any instructions that are specific to a particular question.
- Supplementary pages for planning/continuing your answers to questions are provided at the end of this Question/Answer booklet. If you use these pages to continue an answer, indicate at the original answer where the answer is continued, i.e. give the page number.

See next page

Section One: Multiple-choice

30% (30 Marks)

Multiple Choice Answers

1	A
2	C
3	B
4	D
5	C
6	A
7	A
8	B
9	D
10	C
11	A
12	A
13	C
14	D
15	A
16	B
17	D
18	B
19	D
20	B
21	A
22	C
23	A
24	C
25	B
26	B
27	A
28	C
29	B
30	D

See next page

Section Two: Short answer**50% (107 Marks)**

This section has **38** questions. Answer **all** questions. Write your answers in the spaces provided.

Supplementary pages for planning/continuing your answers to questions are provided at the end of this Question/Answer booklet. If you use these pages to continue an answer, indicate at the original answer where the answer is continued, i.e. give the page number.

Suggested working time: 90 minutes.

Question 31**(14 marks)**

- (a) Aortic valve stenosis, where the valve is unable to fully open, is one of many congenital birth defects and can cause failure to thrive in children. State where this valve is located and explain the effect this condition would have on blood flow through the heart.

(3 marks)

Description	Mark
In between the left ventricle and aorta	1
Reduces/blocks flow from the heart/left ventricle into your aorta	1
Increase pressure of the blood in the heart	1
Total	3

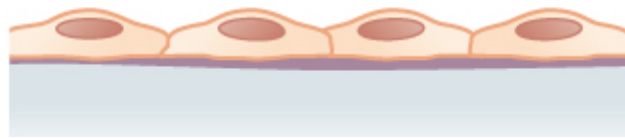
- (b) Lifestyle choices can compromise the functioning of the human body. Describe how a person's diet can impact their circulatory system.

(3 marks)

Description	Mark
Any of the following or other appropriate answers:	
Lack of iron	1-3
Reduces haemoglobin / reduces oxygen transportation	
Leading to irregular heartbeats / heart failure / enlarged heart	
Increase in cholesterol / LDL / bad cholesterol / fatty deposits / triglycerides	1-3
Causing narrowing of arteries / increase blood pressure / clogs arteries	
Leading to heart attack / stroke / cardiovascular disease	
Increased alcohol intake	1-3
Can increase blood pressure / constrict blood vessels	
Leading to heart failure / cardiovascular disease / heart attack / stroke	
Increased salt intake	1-3
Increased blood pressure	
Heart attack / stroke / cardiovascular disease	
Total	3

See next page

Below is a microscopic image showing the lining of a blood vessel.



(c) Identify the tissue type shown above and briefly describe how its structure allows for effective exchange of gases.

(4 marks)

Description	Mark
Epithelium	1
One / single layer	1
Flattened cells	1
Allowing for short distance of gases to travel	1
Total	4

(d) Draw a labelled diagram in the space below to contrast the structural differences between arteries and veins.

(4 marks)

Description	Mark
Marks awarded for:	
<ul style="list-style-type: none"> • Correct identification of the artery and vein 	1
<ul style="list-style-type: none"> • Artery drawn with a thicker wall than the vein - labelled elastic and muscle tissue 	1
<ul style="list-style-type: none"> • Artery with a narrow lumen, veins with a larger lumen – labelled 	1
<ul style="list-style-type: none"> • Vein drawn with valves, artery with no valves - labelled 	1
<p><i>Example:</i></p> <p>The diagram illustrates the structural differences between an artery and a vein. On the left, an artery is shown with a small lumen and a thicker elastic/muscular wall. On the right, a vein is shown with a large lumen, a thinner elastic/muscular wall, and a valve.</p>	
Total	4

Question 32

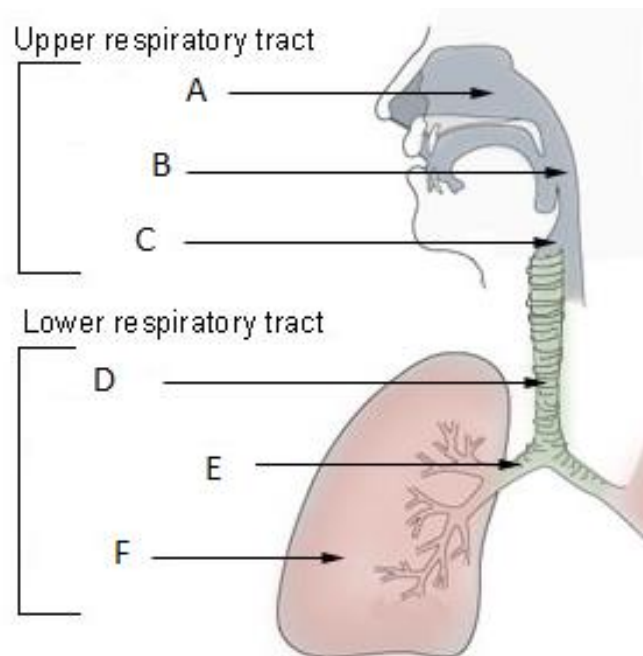
(14 marks)

(a) Explain how muscles of the chest area are involved in the process of inspiration.

(4 marks)

Description	Mark
Intercostal muscles contract	1
Ribs are pulled up and out	1
Diaphragm muscles contract and move down	1
Volume of thorax increases and pressure decreases	1
Total	4

Below is a diagram of the respiratory system.



(b) Identify the structures located at

(2 marks)

Description	Mark
C Larynx	1
E Bronchus	1
Total	2

- (c) Explain why mucus would be found in the structure identified by the letter D.

(2 marks)

Description	Mark
Trap and remove	1
Dust / particles / microbes etc.	1
Total	2

- (d) Differentiate between the types of cartilage found in the epiglottis and the trachea, and state why these types of cartilage are present in these structures.

(6 marks)

Description	Mark
Epiglottis is elastic cartilage	1
Trachea is hyaline cartilage	1
Hyaline has more closely packed fibres, elastic has less closely packed fibres	1
Elastic contains elastic fibres and hyaline contains collagen fibres	1
Trachea / hyaline - due to the strength and/or flexibility	1
Epiglottis / elastic – due to flexibility and/or elastic recoil	1
Total	6

Question 33

(12 marks)

Floppy baby syndrome is a way of describing a newborn baby with low muscle tone, known as hypotonia.

- (a) Describe how muscle tone is related to posture.

(3 marks)

Description	Mark
Muscle tone is the partial contraction of skeletal muscles	1
Muscle tone holds the body parts in position	1
A person's posture depends on their muscle tone / muscles holding the body in a certain position	1
Total	3

- (b) Strengthening of support muscles is a treatment for low muscle tone. When exercising, it is important that resistance is used during both extension and flexion of the arm. Explain the reason for this.

(2 marks)

Description	Mark
Exercises both (antagonistic) pairs of muscles / bicep and triceps muscle	1
Both of which must work during contraction of the muscles	1
Total	2

Due to the side effects of anabolic steroids, the use of them in Australia is legal only when prescribed by a doctor for proper medical reasons. Athletes sometimes take anabolic steroids illegally to improve their athletic performance. In young people, particularly those whose bones have not yet fully developed, this can speed up the process of cartilage becoming bone.

- (c) Describe what the term 'anabolic' means.

(2 marks)

Description	Mark
Type of reaction in which complex molecules are formed	1
Requires energy	1
Total	2

- (d) Outline how consumption of anabolic steroids may impact the bone growth and height of a young person.

(3 marks)

Description	Mark
Bones will harden earlier / bone growth will stop sooner	1
Resulting in shorter bone length / bones won't grow as long	1
Young person not reaching their full potential in height	1
Total	3

- (e) Another health consequence of anabolic steroids is the stiffening of tendons. What is the function of a tendon and how could this impact the athlete's performance?

(2 marks)

Description	Mark
Fibrous connective tissue attaching muscle to the bone	1
Results in injury/decrease in performance	1
Total	2

Question 34
marks)

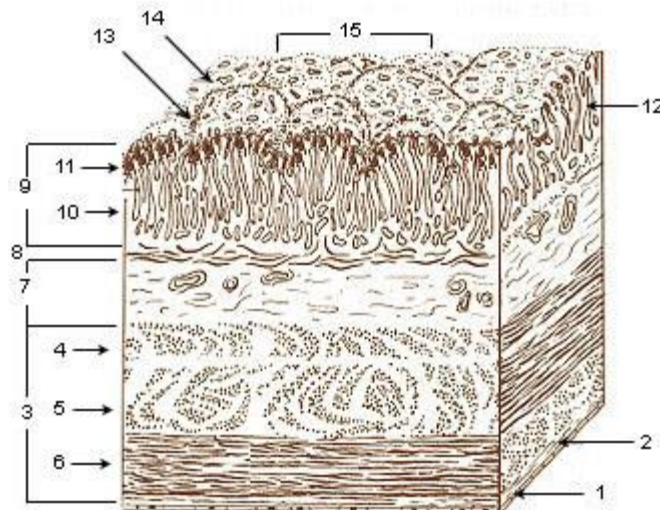
(11

(a) Define the term 'digestion' and state how it is different to 'metabolism'.

(2 marks)

Description	Mark
The (chemical and mechanical) breakdown of food into absorbable products	1
Any one difference, such as: <ul style="list-style-type: none"> • Only biochemical reactions in metabolism • Break down and build up in metabolism • Digestion occurs externally, whilst metabolism is internal/within cells 	1
Total	2

The diagram below illustrates a section of the alimentary canal.



(b) Identify the organ to which the section shown in the diagram above belongs.

(1 mark)

Description	Mark
Stomach	1
Total	1

- (c) Name **one** specific cell that you would find in the epithelial area labelled 9 and give the function of the product it secretes.

(2 marks)

Description	Mark
Any of the following cells with function:	
<ul style="list-style-type: none"> Mucosal cell / Goblet cell Secretes mucous for protection 	1-2
<ul style="list-style-type: none"> Parietal cell Secretes hydrochloric acid to aid in the digestion of food/control of bacteria 	1-2
<ul style="list-style-type: none"> Chief cell Secrete pepsinogen which becomes pepsin for breakdown of proteins 	1-2
<ul style="list-style-type: none"> G cell Secrete gastrin which aids the Chief cells/increasing mucosal secretory cells/increase gastric motility 	1-2
Total	2

- (d) Outline how the layers of muscles, identified throughout location 3 in the diagram, aid in the forward movement of the bolus in the digestive system.

(3 marks)

Description	Mark
Circular layer contracts behind bolus to move it forward	1
Longitudinal layer contracts to shorten alimentary canal	1
Occurs in a wave-like manner	1
Total	3

Pancreatic cancer patients often show many signs of digestive disturbance, with weight loss and a decrease in appetite quite common.

- (e) Account for the loss of weight in pancreatic cancer sufferers.

(3 marks)

Description	Mark
Reduction in the number of enzymes reaching the small intestines	1
Therefore, food is not broken down/absorbed	1
And the body must use fat/protein stores to create ATP	1
Total	3

Question 35**(12 marks)**

Excretion applies to the metabolic waste products that cross the cell membrane. The cell membrane is described as a phospholipid bilayer.

- (a) Describe why phospholipids organise themselves into a bilayer in the presence of water.

(2 marks)

Description	Mark
Protects hydrophobic tails from water	1
Exposes hydrophilic tails to water	1
Total	2

- (b) State whether the layers of the plasma membrane bilayer are identical to each other. Give a reason for your answer.

(2 marks)

Description	Mark
No	1
Due to the presence of proteins/other structures	1
Total	2

- (c) Why do metabolic wastes need to be excreted from the cells of the body?

(3 marks)

Description	Mark
Wastes can be toxic	1
Accumulation can lead to cell damage	1
Resulting in death/prevent cells from functioning properly	1
Total	3

An experiment was undertaken to record the amount of sweat lost over a 60-minute exercise session. The results are shown in the diagram below.



(d) Although primarily used for temperature regulation, name **two** metabolic wastes the sweat glands excrete.

(2 marks)

Description	Mark
Any two of the following:	
<ul style="list-style-type: none"> • Water • Lactic acid • Urea • Salts 	1-2
Total	2

(e) The experiment on sweat rate does not include any controlled variables. Give reason why conclusions from such experiments are undesirable in the scientific community and describe how you would include a control variable.

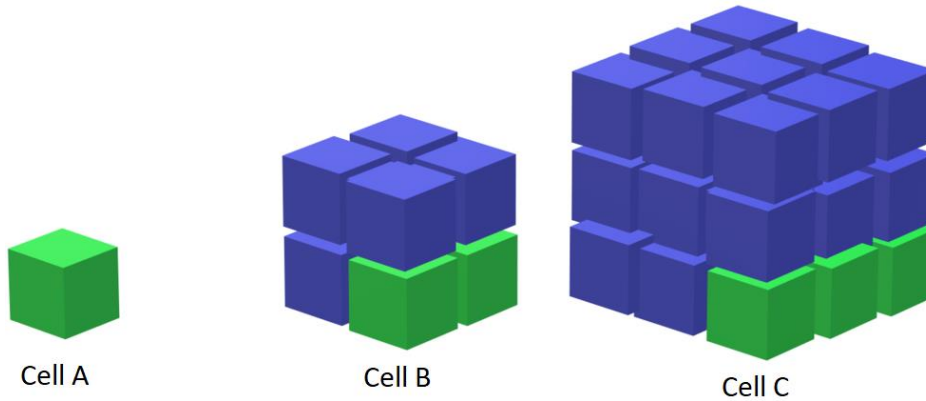
(3 marks)

Description	Mark
Unsure if the results are due to the variable you want to test	1
Makes the experiment invalid / decreases validity	1
One appropriate control variable, such as: - same exercise undertaken by participants	1
Total	3

Question 36

(17 marks)

The diagram below represents the way in which surface area and volume changes with cell size. Each individual, small cube measures 1 cm x 1 cm x 1 cm.



- (a) Complete the table below by calculating the surface area, volume and surface area to volume ratio for Cell B and Cell C.

(6 marks)

	Cell A	Cell B	Cell C
Surface Area	6cm ²	24cm ²	54cm ²
Volume	1cm ³	8cm ³	27cm ³
SA:Vol	6:1	3:1	2:1

- (b) State the trend in the surface area to volume ratio seen in the three cells.

(1 mark)

Description	Mark
SA:Vol decreases as cells get bigger	1
Total	1

- (c) A large surface area to volume ratio is important for the effective functioning of a cell. Identify **two** ways a cell may change their SA:Volume ratio in order to function effectively.

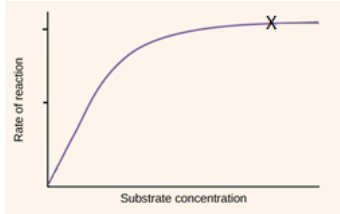
(2 marks)

Description	Mark
Any two of the following or other appropriate answers:	
<ul style="list-style-type: none"> • Divide • Change shape • get long and thin (or flat) • develop folds in the cell/cilia 	1-2
Total	2

See next page

Cells contain thousands of different enzymes that are involved in the many different chemical reactions occurring within them. The rate of these chemical reactions can be affected by a number of factors.

- (d) On the grid paper below, sketch a simple curve showing the relationship between substrate concentration and the rate of reaction. (2 marks)

Description	Mark
Rate of reaction on Y axis, substrate concentration labelled on X-axis	1
Graph increases to a point, where it then rounds off and remains steady	1
Example answer: <div style="text-align: center;">  </div>	
Total	2

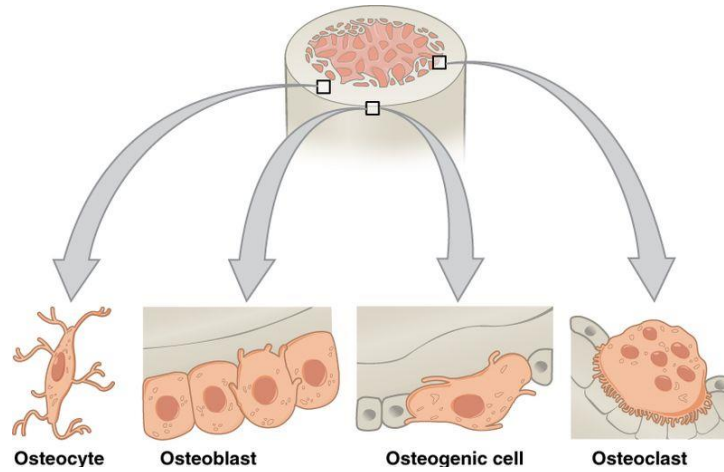
- (e) Explain the typical shape of a graph that shows how enzyme activity changes with temperature. (6 marks)

Description	Mark
Initially enzyme activity increases as temperature increases	1
Due to increased kinetic energy of molecules	1
More collisions that have sufficient energy to overcome activation energy	1
Resulting in more collisions between enzyme and substrate	
Reaches an optimum temperature	1
The rate of reaction decreases after optimum	1
Due to denaturing of the enzyme / change in active site of the enzyme	1
Total	6

Question 37

(14 marks)

Bone cells compose less than 2% of the bone mass. The types of cells found within the bone are shown below.



- (a) What function do osteoblasts serve and where would you find these cells within the bone? (2 marks)

Description	Mark
Formation of bone matrix / synthesis of new bone cells	1
Endosteum and/or cell lining of periosteum	1
Total	2

- (b) Explain how the cellular projections of the osteocyte allow bone cells to communicate. (3 marks)

Description	Mark
Enter the canaliculi	1
where they contact other bone cells/osteocytes	1
allowing materials to be passed between cells	1
Total	3

(c) Most bones contain both spongy and compact tissue. Identify **three** differences between these types of tissue.

(3 marks)

Description	Mark
Any three of the following, or other acceptable answers:	
• Compact bone is dense, spongy bone is porous	1-3
• Compact consists of osteons, spongy bone of trabeculae	
• Compact contains yellow marrow, spongy bone red marrow	
• Compact bone has no space between lamellae, spongy bone does	
Total	3

The site where two bones connect is known as a joint. The image below shows the sagittal view of an elbow joint.



(d) Identify the type of synovial joint located at the elbow and state the **two** movements which take place at this type of joint.

(3 marks)

Description	Mark
Hinge	1
Flexion	1
Extension	1
Total	3

- (e) Movement of joints occurs frequently. Describe how the structure of the synovial joint allows for continuous use with minimal damage.

(3 marks)

Description	Mark
Any three of the following:	1-3
<ul style="list-style-type: none"> • Fibrous capsule (accept articular capsule) strength resists dislocation 	
<ul style="list-style-type: none"> • Synovial fluid keeps joint lubricated / prevents bones rubbing on each other/reduces wear and tear 	
<ul style="list-style-type: none"> • Articulating cartilage provides smooth surface for ease of movement 	
<ul style="list-style-type: none"> • Bursae prevents friction 	
<ul style="list-style-type: none"> • Ligament which holds the bones together 	
<ul style="list-style-type: none"> • Fit of the articulating bones/muscles around joint provide stability 	
Total	3

Question 38**(13 marks)**

A 53-year-old woman began complaining of a dull ache in her left arm and presented with a pale, sweaty face to the first aid station at the Perth Royal Show. The paramedics suspected that she was suffering a myocardial infarction (heart attack), and an ambulance was called. Whilst waiting for the ambulance, the woman was given an oxygen mask and an injection of an isotonic solution into the vein.

- (a) Explain why the patient was given a supply of oxygen.

(3 marks)

Description	Mark
Heart may not be working / pumping effectively	1
Meaning the brain is not receiving adequate oxygen	1
Raise the amount of oxygen reaching the heart and the brain	1
Total	3

- (b) Explain how the injection of isotonic solution will affect the patient's extracellular fluid volume.

(3 marks)

Description	Mark
Extra Cellular Fluid volume will increase	1
Isotonic solution will have same concentration as cells	1
Solution (or water) doesn't move into the intracellular fluid	1
Total	3

- (c) Following the 53-year-old patient's suspected heart attack, her doctor noticed the site of the intravenous injection was red and inflamed. The doctor proceeded to check the size of the patient's lymph nodes in her armpit. Explain why this was done.

(2 marks)

Description	Mark
Red and inflamed / swollen lymph nodes are suggestive of an infection	1
due to increase of lymphocytes/WBC being made to fight the disease	1
Total	2

- (d) Account for the higher percentage of water found in the lungs.

(2 marks)

Description	Mark
Large amounts of mucous that is produced containing water	1
Gases can only diffuse when dissolved in fluid	1
Total	2

Some of the fluid found within the circulatory system is forced out due to the high pressure of blood entering the capillary beds and is then returned via the lymphatic system.

- (e) Contrast the lymphatic and circulatory systems.

(3 marks)

Description	Mark
Any three of the following, or other appropriate comparisons:	
<ul style="list-style-type: none"> • Lymphatic contains lymph, circulatory system contains blood • Lymphatic system composed of lymph vessels and nodes, circulatory system composed of veins, arteries and capillaries • Lymphatic system flows in one direction/towards the heart, circulatory flows in two directions/towards and away from the heart • Lymphatic system lacks red blood cells, circulatory system contains RBC • Lymphatic fluid moves due to skeletal muscle movement, circulatory fluid moves due to heart contractions • Lymphatic system fluid moves slowly, circulatory system blood moves fast 	1-3
Total	3

Section Three: Extended answer

20% (40 Marks)

Part 1

Question 39

(20 marks)

Haemodialysis is a treatment for kidney disease in which external equipment is used to mimic the function of the kidneys. The patient's blood is passed through artificial membranes within a machine, with dialysis fluid running as a counter-current flow next to the blood.

- (a) Describe the function of the kidneys and explain why the patient's blood and dialysis fluid are passed by each other in opposite directions, describing how the waste products are filtered from the blood.

(8 marks)

Description	Mark
Function of Kidneys:	
Maintain concentrations of substances at optimal levels in body fluids / pH of blood / H ⁺ of blood	1-2
Excretion of wastes/urea	
Counter-current flow:	
Maintains a difference in concentration between blood and dialysis fluid	1-3
maximising the concentration gradient	
allowing for faster diffusion	
How it filters:	
Works via diffusion	1-3
Waste concentration in blood is high and in fluid is low	
Waste moves from areas of high concentration to low concentration	
Total	8

- (b) Unlike other metabolites, amino acids are unable to be stored in the human body for later use. Outline the steps required in order to remove these excess amino acids, ensuring you refer to the processes occurring within both the liver and kidneys.

(12 marks)

Description	Mark
NH ₂ /Amino group is removed (from amino acid)	1
In a process called deamination	1
amino acid + oxygen → carbohydrate + ammonia/NH ₃	1
NH ₃ + CO ₂ → urea + H ₂ O	1
All occur within the liver	1
Urea travels to the kidney via the blood	1
Glomerular filtration first occurs where	1
filtrate containing urea is forced into the glomerular capsule / nephron	1
Selective reabsorption of some urea occurs across the nephron	1
Remaining filtrate collects into the renal pelvis / drains into the ureters	1
Urine is stored in the bladder until excreted	1
Urine is excreted through the urethra	1
Total	12



Question 40

(20 marks)

In nervous tissue, vesicular transport is important for both the release and reuptake of neurotransmitters, which carry information between nerve cells and body parts.

- (a) Define vesicular transport and describe the different types of vesicular transport that may occur. Include an example of a substance that is transported by each of the different types of vesicular transport.

(12 marks)

Description	Mark
Movement of substances across the cell membrane in membranous sacs / vesicles	1
Both require ATP / active processes / require energy	1
Endocytosis	1
Substances are taken into the cell	1
Pinocytosis = liquid/water	1
Phagocytosis = solid	1
Vesicle formed is suspended in the cytoplasm	1
E.g. cholesterol / iron ions / micro-organisms / cell debris / other acceptable answers	1
Exocytosis	1
Substances are released to the outside of the cell	1
Vesicle fuses with the cell membrane	1
E.g. mucus / enzymes / neurotransmitter release / milk secretion / other acceptable answers	1
Total	12

- (b) At a neuromuscular junction, the neuron transmits a message to the muscle to begin contractions. Briefly outline the sliding filament theory of muscle fibre contraction.

(8 marks)

Description	Mark
Calcium ion (Ca^{2+}) influx	1-8
Calcium ion attaches to troponin	
Displaces tropomyosin and	
myosin binding site (on actin) is exposed	
ATP is hydrolysed / broken down allowing	
Myosin to attach to actin	
Crossbridge forms	
Power stroke occurs	
Actin slides / pulled over myosin	
Z-lines / I-bands / sarcomere shortens	
Total	8

Part 2



Question 41

(20 marks)

- (a) Proteins are large, complex molecules that play a variety of critical roles in the human body. Briefly describe the composition of proteins, and outline how each of a cell's organelles are associated with proteins.

(12 marks)

Description	Mark
Composition of proteins:	
Made of amino acids	1
Connected by peptide bonds	1
Cell organelles and proteins:	
Golgi body modifies and packages proteins into vesicles for secretion	1-10
Lysosomes contain enzymes able to break down proteins	
Proteins are found suspended in the cytosol / cytoplasm	
Cell membrane contains proteins/protein channels	
Nucleus houses DNA which determines what proteins are made	
Nucleolus plays a role in manufacturing proteins / ribosomal proteins	
Ribosomes are the site of protein production	
Endoplasmic reticulum transports/synthesises/folds proteins	
Mitochondria can use proteins as a source of energy	
Cytoskeleton is made up of proteins	
Centromeres/Centrioles are complex proteins involved in cell division	
Total	12

- (b) Cellular respiration can be undertaken in both the presence and absence of oxygen. Outline the process of respiration which occurs when oxygen is present.

(8 marks)

Description	Mark
Aerobic respiration	1
Breakdown of glucose in the presence of oxygen to carbon dioxide and water / glucose (C ₆ H ₁₂ O ₆) + oxygen (O ₂) → carbon dioxide (CO ₂) + water (H ₂ O)	1
Glycolysis occurs in the cytoplasm	1
Glucose is split into two pyruvate molecules	1
Pyruvate enters the mitochondria / next steps occur in the mitochondria	1
Pyruvate is converted to Acetyl CoA / acetyl coenzyme A	1
Acetyl CoA enters the Krebs / Citric acid cycle	1
Final stage is electron transport system / oxidative phosphorylation	1
36 molecules of ATP produced	1
Total	8

See next page



Question 42

(20 marks)

- (a) Blood is made up of plasma and formed elements, with 45% of blood being composed of cells and fragments of cells. Briefly describe the structure and function of the formed elements within blood.

(12 marks)

Description	Mark
Erythrocytes	1
Biconcave / thinner in the middle than at the edges	1-3
Have no nucleus	
contains haemoglobin	
Allows cells to easily move through blood vessels	
Small cells	
Transports oxygen from lungs to the cells of the body	1
Leucocytes	1
Large cells	1
Variety of structure based on the type of leucocyte	
Contains a nucleus	
Role in protecting the body from infection	1
Platelets / Thrombocytes	1
Smaller than a red blood cell	1-2
Fragments of cells	
No nucleus	
Role in clotting of the blood	1
Total	12

- (b) Nutrients, found circulating in the blood, must first be absorbed through the digestive tract. Explain how nutrients are absorbed in the small intestine.

(8 marks)

Description	Mark
Villi absorb nutrients / digested food	1
Villi are 1mm long	1-2
Inside is a lacteal (lymph capillary) surrounded by blood capillaries	
Villi is thin (1 cell thick)	
The villi move which increases absorption	
Amino acids absorb via active transport into blood capillaries	1-5
Fatty acids and glycerol absorbed by simple diffusion into villi	
Then recombine to form fat absorbed into the lacteal	
Fat-soluble vitamins are absorbed into the lacteal	
Water is absorbed into the blood capillaries by osmosis	
Water-soluble vitamins are absorbed into the blood capillaries by diffusion	
Simple sugars absorbed via active transport into the blood capillaries	
Total	8

See next page

ACKNOWLEDGEMENTS

- Question 12** Chaisurivirat, D. (2021). *Types of Charts and Graphs*. Image, adapted and used under license from Shutterstock.com. Retrieved on 27th September 2021, from: <https://www.shutterstock.com/image-vector/types-charts-graphs-1680587845>
- Question 15** Young, K. et al. (2013). *Anatomy and Physiology: Blood Typing (Image)*. OpenStax College. Adapted and accessed for free on 5th October 2021, from: <https://openstax.org/books/anatomy-and-physiology/pages/1-introduction>.
- Question 20 & 21** training.seer.cancer.gov, Public domain, via Wikimedia Commons (2006). *Picture of Kidney (Image)*. Accessed for free on 13th November 2021, from: https://commons.wikimedia.org/wiki/File:Illu_kidney.jpg
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