2024 VCE VET Health external assessment report

General comments

The 2024 VCE VET Health examination provided students with the opportunity to demonstrate their knowledge and understanding of the following two Units of Competency:

* HLTAAP001 Recognise Healthy Body Systems
* BSBMED301 Interpret and Apply Medical Terminology Appropriately.

Students demonstrated a sound understanding of the basic functions of body systems and structures within these systems (Section B, Questions 2, 13a., 13b. and 16). Students tended to perform better on these questions about systems that have been heavily assessed in the past (e.g. the integumentary and cardiovascular systems) than on questions about the functions of less commonly assessed structures (e.g. pleura and spinal column). Students are encouraged to ensure they can clearly and concisely state the functions of all major organs and systems. This will significantly improve their responses across a range of questions.

Accurate identification of body parts and structures from diagrams (Section B, Question 8) requires improvement. Past examinations provided word lists that helped students with these types of questions. The 2023 examination report encouraged students to practise learning anatomical structures independently of word lists, and they were not provided in the 2024 examination. Students did not perform as well on this type of question this year. It is strongly recommended that students learn to label anatomical structures independently of word lists, as this is basic content and expected knowledge from the Unit of Competency.

Another area requiring improvement was the capacity to break down medical terminology. The identification of word parts (e.g. prefixes, word roots, suffixes and combining vowels) was slightly improved over previous years (Section B, Question 11), but many students could not provide accurate definitions of the word parts provided. It is strongly recommended that students focus on learning prefixes and suffixes as much as common root words. In some ways, learning prefixes and suffixes can be easier, as their meanings remain relatively the same regardless of the combination of root words with which they are used. Students should also be encouraged to pay particular attention to the nuance of different suffixes and prefixes, such as the difference between the suffix ‘-ia’ (‘condition of’) and ‘-ic’ (‘pertaining to’).

Students require support to develop a stronger understanding of the interrelationships between different systems and their combined effect on different functions (Section C, Question 4b). For these types of questions, students are encouraged to consider what outcome or function is at the centre of the question. In Section C, Question 4b., ‘mobilisation’ is at the centre of the question, followed by identification of how each respective system contributes to that function.

Similarly, students are encouraged to spend time understanding the more complex aspects of physiology, such as urine formation (Section B, Question 15b. and Section C, Question 10b.). Many responses inadequately discussed urine formation in the context of pH and electrolyte balance, and the role of ADH in urine formation to control blood pressure, which require an understanding of the concepts of reabsorption and secretion. Students would benefit from time spent understanding the language around the difference between absorption/reabsorption and secretion/excretion.

Students should learn abbreviations as they appear in case studies and within contexts. This is more effective than learning or defining lists of abbreviations, and ideally should be reviewed regularly. When learning abbreviations, it is recommended that students are supported to identify where variations of a word exist (e.g. ‘#’ can mean ‘fracture’ or ‘fractured’), and to transpose their chosen definition back into the case study to ensure it makes sense. For example: ‘John sought treatment for a # he sustained during training’. In this case, ‘fracture’ is the appropriate choice.

Specific information

This report provides sample answers, or an indication of what answers may have included. Unless otherwise stated, these are not intended to be exemplary or complete responses.

The statistics in this report may be subject to rounding, resulting in a total of more or less than 100 per cent.

Section A – Multiple-choice questions

The following table indicates the percentage of students who chose each option. Bold text and grey shading indicate the correct answer.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Question | Correct answer | % A | % B | % C | % D | Comments |
| **1** | C | 13 | 32 | **38** | 17 | Option C is correct as anatomical position requires the palms to be facing forward, meaning that the thumbs are on the outer/lateral side of the hands, away from the midline. Option B is incorrect, as ‘distal’ refers to being further away from the point of attachment to the body. While the thumb is shorter than other digits, its relative position is not considered more distal compared to the other digits, which extend farther from the hand. |
| **2** | A | **30** | 28 | 30 | 12 | Option A is correct as adipose or fat tissue is connective tissue. Skin (B) is a type of epithelial tissue; smooth muscle (C) is a type of muscle tissue; and nervous (D) is a type of nervous tissue. |
| **3** | A | **50** | 8 | 38 | 4 |  |
| **4** | D | 19 | 27 | 6 | **47** | Option D is correct as the spleen is a small organ and the red pulp within the spleen filters blood. Option A is referring to the liver, and Option B is referring to the production of digestive enzymes, which is not a role of the spleen. Option C is incorrect as it is referring to the pancreas.  |
| **5** | C | 22 | 12 | **46** | 20 | Option C is correct as it is the only structure listed that belongs to the appendicular skeleton. All other structures (vertebral column, cranium and rib cage) are components of the axial skeleton. |
| **6** | D | 18 | 52 | 10 | **19** | Option D is correct as ghrelin is a hormone produced by the enteroendocrine cells in the stomach, and stimulates hunger. Option A is incorrect as leptin regulates long-term energy levels in response to depletion or accumulation of fat stores rather than being primarily involved in hunger. Option B is incorrect as gastrin is a hormone that stimulates the secretion of hydrochloric acid (HCl) in the parietal cells of the stomach. HCl is responsible for denaturing proteins and protecting the digestive tract from ingested pathogens. Gastrin is only indirectly related to hunger as it can promote gastric emptying, which then stimulates the release of ghrelin, which then promotes hunger. |
| **7** | A | **64** | 2 | 22 | 12 |  |
| **8** | B | 1 | **86** | 4 | 9 |  |
| **9** | B | 22 | **32** | 29 | 17 | Option B is correct as Schwann cells are responsible for the maintenance and regeneration of axons in the peripheral nervous system. Option A is incorrect as oligodendrocytes perform a similar role in the central nervous system. Students who selected Option C have likely confused ‘neuron’ with ‘nephron’.  |
| **10** | C | 24 | 4 | **64** | 9 |  |
| **11** | C | 18 | 8 | **68** | 7 |  |
| **12** | A | **50** | 10 | 5 | 35 |  |
| **13** | D | 10 | 5 | 43 | **41** | Option D is correct as ‘bar/o’ is the combining form meaning pressure (e.g. ‘baroreceptors’ measure pressure in structures such as the carotid arteries). Option C is incorrect as the combining form for bacteria is ‘bacter/i/o’.  |
| **14** | B | 28 | **47** | 8 | 16 | Option B is correct as the cortex of the adrenal gland produces and releases cortisol. Option A is incorrect as the pituitary gland is involved in releasing ACTH, which then stimulates the adrenal cortex to release cortisol. Option C is incorrect as the pancreas produces glucagon and insulin. Option D is incorrect as the parathyroid gland produces parathyroid hormone. |
| **15** | B | 10 | **50** | 22 | 18 |  |
| **16** | C | 19 | 5 | **73** | 3 |  |
| **17** | A | **36** | 25 | 15 | 23 | Option A is correct as the eustachian tube connects the middle ear with the nasopharynx, which allows pressure to be equalised between the middle ear and the external atmosphere. Option B is incorrect, as the external auditory canal is the tube that transmits sound waves from the outer ear to the middle ear. Option D is incorrect as the organ of Corti within the cochlea contains hair cells that generate electrical signals in response to sound waves. |
| **18** | A | **49** | 30 | 9 | 13 |  |
| **19** | B | 21 | **56** | 16 | 7 |  |
| **20** | D | 10 | 33 | 8 | **48** | Option D is the correct response as muscles are described as having ‘elasticity’ because they can return to their original length after being contracted or stretched. They are also ‘excitable’ as they can respond to stimuli from motor neurons. They are also ‘contractile’ as they can shorten to produce contraction. The other options are incorrect as they contain terms such as ‘spasticity’, which is a disruption in muscle movement causing prolonged contraction and tightness. This is not seen in healthy muscles. The other options also contain ‘rigidity’, which refers to stiffness or inability to change shape. This is also not seen in healthy muscles. |

Section B

Section B consisted of 17 short-answer questions that awarded a maximum of 50 marks. These questions tested students’ knowledge of medical terminology, abbreviations, and anatomical and physiological aspects of the human body. The majority of these questions were direct questions requiring students to recall key concepts from both units of competency covered in this examination. Question 14 provided information in the context of a case study requiring students to interpret abbreviations.

Question 1

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Mark  | 0 | 1 | 2 | 3 | 4 | Average |
| % | 12 | 38 | 35 | 7 | 8 | 1.6 |

|  |  |  |
| --- | --- | --- |
| Organ | Combining form | Body system |
| spleen | splen/o or lien/o | lymphatic / immune / cardiovascular system |
| bladder | cyst/o or vesic/o | urinary system |

Marks were awarded for a correct response in each cell. Most responses could identify that the bladder belongs to the urinary system, but many did not identify a correct combining form for either the spleen or the bladder. Students should be careful to identify if the question requests a combining form or a word root. Additionally, students completing these questions with special examination arrangements for computer use need to be very careful of the symbols they enter into the computer, as well as autocorrect and typographical errors.

Question 2

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Mark  | 0 |  | 1 | 2 | Average |
| % | 22 |  | 27 | 51 | 1.3 |

This question required students to identify one component of the blood and state its function.

Most responses identified the four components of blood:

* red blood cells / erythrocytes
* white blood cells / leukocytes
* platelets/thrombocytes
* plasma.

As the question asked for a component to be named, abbreviations such as ‘RBC’ and ‘WBC’ were not accepted alone. However, students could state ‘Red blood cells (RBCs) are a component of blood’ and then subsequently use the abbreviation.

Accepted responses for the function of each of the components included:

* red blood cells – transport oxygen through the body or contain haemoglobin, which binds to oxygen
* white blood cells – detect and/or destroy pathogens
* platelets – involved in haemostasis to stop bleeding or involved in blood clotting
* plasma – transports cells/nutrients/water/vitamins/hormones or maintains blood volume.

The most common errors were the incorrect naming of haemoglobin as a component of blood, and responses that confused the function of white blood cells with red blood cells.

Question 3

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Mark | 0 | 1 | 2 | Average |
| % | 41 | 16 | 43 | 1.0 |

Many responses did not correctly define a difference between both systems.

Accepted responses included:

* The autonomic nervous system is involved in unconscious responses whereas the somatic nervous system is involved in conscious responses.
* The autonomic nervous system is involved in involuntary responses whereas the somatic nervous system is involved in voluntary responses.

Responses were also awarded marks for correctly identifying a function controlled by each system (e.g. peristalsis for the autonomic nervous system, and skeletal muscle movement for the somatic nervous system).

For questions that require a comparison, students should be careful to use terms such as ‘whereas’ or ‘compared to’ to illustrate the difference. Thus, responses that were just presented as dot points were not awarded marks.

Question 4

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Mark  | 0 | 1 | 2 | Average |
| % | 27 | 45 | 28 | 1.0 |

|  |  |  |
| --- | --- | --- |
| Structure | Function | Mark(s) |
| gallbladder | stores/concentrates/releases bile | 1 mark |
| anus | opening through which faeces are evacuated from the body | 1 mark |

This question was answered well by most students. The most common error was listing ‘rectum’ instead of ‘anus’. Additionally, marks were not awarded for responses that identified the gallbladder was responsible for the ‘production’ of bile, as this process is controlled by the liver. Students should be careful of the language used when answering questions such as this. For example, ‘secretion’ is defined as a ‘process by which substances are produced and discharged’.

Question 5a.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Mark  | 0 | 1 | 2 | Average |
| % | 25 | 45 | 30 | 1.1 |

|  |  |  |
| --- | --- | --- |
| Abbreviation | Meaning | Mark(s) |
| # | fracture or fractured | 1 mark |
| OT | occupational therapist | 1 mark |

Most responses could correctly define ‘OT’ as an occupational therapist, but some did not identify ‘#’ as meaning ‘fracture’. No marks were awarded for ‘occupational therapy’.

Question 5b.

|  |  |  |  |
| --- | --- | --- | --- |
| Mark  | 0 | 1 | Average |
| % | 42 | 58 | 0.6 |

|  |  |
| --- | --- |
| Solution | Mark |
| hinge | 1 mark |

This question was answered reasonably well, with many students correctly selecting a hinge joint as the correct joint in the distal phalanx on her right index finger. The most common misconception was that this was a condyloid joint. Condyloid joints are found between the radial and ulnar heads with the carpals.

Question 5c.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Mark  | 0 | 1 | 2 | Average |
| % | 41 | 43 | 17 | 0.8 |

This question referred to the joint type selected in Question 5b. To ensure students were not penalised twice for consequential marks, this question was marked independently; therefore, students who identified ‘condyloid’ or ‘ball and socket’ joints in Question 5b. could access full marks if they correctly named one movement occurring at the joint and described its motion. Overall, this question was not answered well, with many responses not identifying the names of specific movements and only providing vague descriptions of the movements.

Acceptable responses included:

* hinge joint

|  |  |
| --- | --- |
| Name | Description |
| flexion | reduction in joint angle/bending |
| extension | increase in joint angle/straightening |

* condyloid joint

|  |  |
| --- | --- |
| Name | Description |
| flexion | reduction in joint angle/bending |
| extension | increase in joint angle/straightening |
| abduction | movement way from the midline |
| adduction | movement towards the midline |

* ball and socket joint

|  |  |
| --- | --- |
| Name | Description |
| flexion | reduction in joint angle/bending |
| extension | increase in joint angle/straightening |
| abduction | movement way from the midline |
| adduction | movement towards the midline |
| internal rotation | rotation towards the midline |
| external rotation | rotation away from the midline |
| circumduction | 360° movement, or movement in all directions |

Question 6a.

|  |  |  |  |
| --- | --- | --- | --- |
| Mark  | 0 | 1 | Average |
| % | 9 | 91 | 0.9 |

|  |  |
| --- | --- |
| Solution | Mark |
| osteopenia | 1 mark |

Most responses identified ‘osteopenia’ as the correct spelling for the condition that is a precursor to osteoporosis.

Question 6b.

|  |  |  |  |
| --- | --- | --- | --- |
| Mark | 0 | 1 | Average |
| % | 11 | 89 | 0.9 |

|  |  |
| --- | --- |
| Solution | Mark |
| oesophagus | 1 mark |

Most responses identified ‘oesophagus’ as the correct spelling for the organ belonging to the digestive system.

Question 7

Most responses did not identify a correct similarity and difference between the cardiovascular and lymphatic systems. Generally, responses identified a similarity but not a relevant difference, with many suggesting that the lymphatic system is involved in an immune response but that the cardiovascular system is not, despite the role of white blood cells in the cardiovascular system.

Question 7a.

|  |  |  |  |
| --- | --- | --- | --- |
| Mark  | 0 | 1 | Average |
| % | 61 | 39 | 0.4 |

Accepted responses for similarities between the cardiovascular and lymphatic systems included:

* Body systems transport fluids such as blood and lymph.
* Both systems contain vessels or capillaries.
* Both systems transport fluid in one direction.
* Both systems contain valves.
* Both systems have a return pathway to the heart.
* Both systems contain leukocytes / white blood cells / lymphocytes.
* Both systems contract skeletal muscle to transport fluid.
* Both systems have a role in homeostasis of fluid balance.

Question 7b.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Mark  |  | 0 | 1 | Average |
| % |  | 69 | 31 | 0.3 |

Accepted responses for differences between the cardiovascular and lymphatic systems included:

* The cardiovascular system contains a pump (heart), whereas the lymphatic system does not.
* The cardiovascular system is a closed circuit, whereas the lymphatic system is an open circuit.
* The cardiovascular system transports blood, whereas the lymphatic system transports lymph.
* The cardiovascular system transports oxygen and carbon dioxide, whereas the lymphatic system does not.
* The lymphatic system contains lymph nodes, whereas the cardiovascular system does not.

The most common reasons marks were not awarded was that responses did not use a comparison term, such as ‘whereas’, or did not mention both systems (e.g. ‘The cardiovascular system contains a pump’). Many responses simply listed structures contained in each system but did not draw comparisons.

Question 8a.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Mark  | 0 | 1 | 2 | Average |
| % | 49 | 28 | 23 | 0.8 |

thoracic

sacral / sacrum /
sacrum and coccyx

This question produced mixed responses. The most common reasons marks were not awarded were:

* incorrectly identifying ‘thoracic’ as ‘thorax’, or using spelling that did not clearly differentiate ‘thoracic’ from ‘thorax’
* labelling the sacral region as ‘coccyx’ alone.

While misspelling was not penalised for this question, it is important to note that if a misspelling changed the word to mean something that would be incorrect it was not awarded a mark.

Question 8b.

|  |  |  |  |
| --- | --- | --- | --- |
| Mark  | 0 | 1 | Average |
| % | 29 | 71 | 0.7 |

This question produced mixed responses, with some responses comprising one-word answers that did not sufficiently answer the question. Additionally, many responses described the function of the spinal cord rather than the spinal column.

Accepted responses included:

* It protects the spinal cord or spinal nerves.
* It allows for movement and flexibility.
* It helps us to maintain posture.
* It provides stability, support and structure for the body.
* It provides an attachment point for the ribs and pelvis.
* It supports the cranium and head.

Question 9a.

|  |  |  |  |
| --- | --- | --- | --- |
| Mark  | 0 | 1 | Average |
| % | 5 | 95 | 1.0 |

Most responses identified one strategy Arjun could use to minimise the spread of infection. The most common error was that Arjun should wash his hands or perform hand hygiene, indicating that students had likely not read the question properly.

Acceptable responses included:

* Wear PPE (such as gloves, apron, mask, hair net).
* Use tongs or utensils when handling food.
* Wipe down or sanitise food preparation surfaces.
* Avoid touching his face.
* Keep nails short and don’t wear nail polish.
* Avoid wearing a lanyard when preparing food.

Question 9b.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Mark  | 0 | 1 | 2 | Average |
| % | 44 | 31 | 25 | 0.8 |

Most responses did not gain full marks for this question. While many responses could identify or name a protective component of the digestive system, most could not describe with accuracy how this provided protection from food-borne illness. Common errors included responses that were irrelevant, such as discussing how food was digested rather than outlining the protective elements. Additionally, many responses included incorrect information, such as ‘bile is released into the stomach’.

Examples of acceptable responses include:

* Hydrochloric acid in the stomach provides protection as it destroys pathogens ingested in foods.
* Vomiting forcibly removes pathogens from the digestive tract when they have been ingested in food.
* Enzymes such as pepsin and trypsin have a protective function in addition to their digestive functions as they are able to destroy pathogens that have been ingested.
* Bile or bile salts are antimicrobial in nature and protect against pathogens and disease.
* The gut microbiota provides protection by preventing the overgrowth of bad bacteria and pathogens in the digestive tract.
* Peyer’s patches in the small intestine destroy ingested pathogens found within the chyme.
* Diarrhoea forcibly removes pathogens within the digestive tract.
* Lysozyme in saliva destroys pathogens found in food and ingested substances prior to them entering the lower components of the digestive tract.

Question 10

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Mark | 0 | 1 | 2 | Average |
| % | 38 | 36 | 26 | 0.9 |

This question produced mixed responses. Some responses confused either gustation or olfaction with hearing, and included responses relating to the ear. The primary error in responses that were close to achieving full marks was incorrectly identifying the mouth as the sensory organ for taste, rather than the tongue.

|  |  |  |
| --- | --- | --- |
| Medical term | Special sense | Sensory organ |
| vision | sight | eye |
| olfaction | smell | nose or nasal cavity |
| gustation | taste | tongue |

Question 11

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Mark  | 0 | 1 | 2 | 3 | 4 | 5 | 6 | Average |
| % | 12 | 13 | 24 | 27 | 15 | 6 | 2 | 2.5 |

|  |  |
| --- | --- |
|  | **Word part** |
| **Medical term** | **Prefix** | **Root word** | **Combining vowel** | **Suffix** | **Definition of medical term** |
| hepatocyte |  | hepat | o | cyte | liver cell |
| paranasal | para | nas |  | al | alongside/near/beside the nose |
| angiogenesis |  | angi | o | genesis | the formation of blood vessels |

Most responses successfully identified the three word parts correctly, particularly for ‘hepatocyte’, but many responses did not define the medical terms well. The most common error in the definition of medical terms was identifying ‘para’ as meaning ‘around’ (the prefix for ‘around’ is ‘peri’). Other incorrect responses identified ‘paranasal’ as ‘pertaining to an abnormality of the nose’.

Question 12

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Mark  | 0 | 1 | 2 | Average |
| % | 58 | 27 | 15 | 0.6 |

Many responses to the first part of this question were too general or unrelated to the function of the pleura.

Acceptable responses included:

* contains fluid to reduce friction
* provides lubrication during breathing
* allows for maximal expansion
* provides protection for the lungs.

Responses to the question about alveoli were more accurate. The most common reasons marks were not awarded were for responses that were off-topic or discussed structures that were not the alveoli, indicating that some students were unsure what role the alveoli play in the respiratory system.

Acceptable responses included:

* provide a site for gas exchange or diffusion
* secrete surfactant.

Question 13a.

|  |  |  |  |
| --- | --- | --- | --- |
| Mark  | 0 | 1 | Average |
| % | 55 | 45 | 0.5 |

Acceptable responses included:

* bicuspid valve / mitral valve / left atrioventricular valve.

Most responses identified the correct valve. The most common incorrect response was the tricuspid valve. Students should note that if the question requires responses to ‘name’ the valve, it is inadvisable to use abbreviations such as ‘left AV valve’.

Question 13b.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Mark | 0 | 1 | 2 | Average |
| % | 50 | 25 | 26 | 0.8 |

Most responses accurately described the function of the valve. Marks were not awarded for responses that described the general function of valves but did not link this specifically to the function of the bicuspid valve.

Acceptable responses included:

* The bicuspid valve prevents the backflow of blood from the left ventricle into the left atrium.
* The bicuspid valve facilitates the one-way flow of blood from the left atrium into the left ventricle.

Question 14

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Mark | 0 | 1 | 2 | 3 | Average |
| % | 75 | 21 | 3 | 1 | 0.3 |

|  |  |  |
| --- | --- | --- |
| Abbreviation | Meaning | Mark(s) |
| PROM | passive range of motion/movement | 1 mark |
| NBM | nil by mouth | 1 mark |
| P&N | pins and needles | 1 mark |

This question produced mixed responses, with most students successfully identifying NBM. The most common errors or misconceptions were:

* incorrectly labelling P&N as ‘pain and nausea’
* incorrectly labelling PROM as ‘proximal’ or ‘posterior’ range of motion
* errors due to misspelling.

Question 15a.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Mark | 0 | 1 | 2 | Average |
| % | 61 | 21 | 18 | 0.6 |

Acceptable answers included:

* reabsorption and secretion.

This question produced varied responses, with many identifying one of the stages of urine formation but not both. The most common errors were identifying reabsorption as ‘absorption’ and including ‘excretion’ as one of the stages of urine formation.

Question 15b.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Mark | 0 | 1 | 2 | Average |
| % | 86 | 8 | 6 | 0.2 |

Many responses did not describe the relationship between urine formation and the regulation of pH and electrolyte balance. The most common errors discussed fluid balance rather than pH and electrolyte balance. Students should be careful to use the correct terminology when answering questions regarding the urinary system. This question was asking about urine formation, which involves reabsorption and secretion, but many responses incorrectly used ‘absorption’ or referred to the ‘excretion’ of urine, which is not part of the formation process.

Responses were awarded full marks if they identified an electrolyte (e.g. salt, potassium or magnesium) or a hydrogen ion / bicarbonate involved in electrolyte and pH balance. The second mark was awarded for a description of how urine is formed to regulate these levels. Successful responses discussed the ‘reabsorption’ or ‘secretion’ of these components as required to maintain balance.

The following example is based on common elements of high-scoring responses:

The formation of urine has a critical role in maintaining pH and electrolyte balance. During urine formation, hydrogen ions are either reabsorbed back into the blood, or secreted into the tubules to ensure that the pH of blood is within normal ranges.

Electrolyte balance can be managed through urine formation where electrolytes such as salt can be reabsorbed back into the bloodstream when sodium is low, or conversely secreted into the renal tubules when sodium is in excess to achieve electrolyte balance.

Question 16

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Mark  | 0 | 1 | 2 | Average |
| % | 11 | 20 | 69 | 1.6 |

Most responses were awarded at least one mark for identifying a correct organ of the female reproductive system. Some responses identified the vagina or uterus when the question explicitly stated not to include these, while some responses incorrectly listed ‘ovum’ as an organ.

Acceptable responses included:

* fallopian tubes – transport the egg from the ovary to the uterus or is a site for fertilisation
* ovaries – produce, store or release ova/oocytes / to produce oestrogen and progesterone / to control menstruation and ovulation
* cervix – connects the uterus with the vagina / remains closed to maintain a pregnancy / opens during childbirth / provides a passage for sperm into the uterus / is a passageway for menstrual fluids to pass from the uterus to the vagina
* breasts or mammary glands – produce milk / lactation / ejects milk during breastfeeding.

Question 17

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Mark  | 0 | 1 | 2 | 3 | Average |
| % | 49 | 27 | 21 | 2 | 0.8 |

|  |  |
| --- | --- |
| Medical Term | Meaning |
| urologist | specialist in the study of the male reproductive system |
| salpingostomy | surgical unblocking or opening of a fallopian tube |
| orchiopexy | surgical fixation of a testicle |

Most responses gained some marks but few were awarded full marks. The most common error was listing a ‘scrotologist’ as a specialist who studies the male reproductive system.

Section C – Case study

Questions in this section were based on two case studies, and consisted of 11 short-answer questions that were awarded a maximum of 30 marks. Some of these questions required students to analyse and interpret information from the case study when formulating a response. The more complex questions in the examination considered interrelationships between different body systems.

Case study 1

Question 1

|  |  |  |  |
| --- | --- | --- | --- |
| Mark  | 0 | 1 | Average |
| % | 52 | 48 | 0.5 |

This question was answered very well by most students. The most common errors were responses that failed to answer the question. For example, responses that discussed how triage helps to reduce wait times or helps staff to identify what is wrong with a patient are referring to the interviewing of a patient rather than the process of triaging, which happens after the initial assessment.

Acceptable responses included:

* to order patients based on need
* to ensure that the most urgent cases are prioritised
* to ensure timely care of a patient based on need
* to improve patient outcomes
* to allow for the most critical to be treated first
* to improve patient safety
* to support ethical decision-making.

Question 2

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Mark | 0 | 1 | 2 | Average |
| % | 19 | 37 | 44 | 1.3 |

|  |  |
| --- | --- |
| Assessment finding | Medical term / abbreviation |
| condition of abnormally fast heart rate | tachycardia |
| one month | 1/12 |

This question was answered well by most students. The most common error was listing ‘tachycardic’ instead of ‘tachycardia’. This is incorrect as the suffix ‘-ic’ changes the definition of tachycardic to ‘pertaining to’ an abnormally fast heart rate.

Question 3

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Mark  | 0 | 1 | 2 | 3 | 4 | Average |
| % | 15 | 21 | 27 | 22 | 15 | 2.0 |

|  |  |
| --- | --- |
| Term/abbreviation | Medical term / meaning |
| IV | intravenous |
| bd | twice daily / twice a day / two times per day |
| RR | respiratory rate / respiration rate |
| QoL | quality of life |

Many responses were awarded some marks but most were not awarded full marks. Students were generally able to identify intravenous and respiratory rate. The most common error was listing ‘bd’ as ‘bi-daily’ rather than ‘twice daily’.

Question 4a.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Mark | 0 | 1 | 2 | Average |
| % | 49 | 33 | 18 | 0.7 |

Many responses did not clearly articulate the benefits of mobilisation on the respiratory system and instead gave generic answers. Additionally, many responses discussed the benefits to the cardiovascular system, such as improved blood flow, rather than the respiratory system.

Acceptable responses included:

* increased lung capacity
* increased strength of respiratory muscles
* reduced risk of infection/pneumonia
* improved mucociliary / airway clearance
* improved lung ventilation
* increased gas exchange.

Question 4b.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Mark | 0 | 1 | 2 | 3 | Average |
| % | 42 | 23 | 21 | 14 | 1.1 |

Very few responses awarded all three marks. Most responses could identify the musculoskeletal role but did not identify a respiratory role and link it to mobilisation. The most common errors were responses that discussed benefits to the cardiovascular system or did not link back to mobilisation, which was the focus of the question.

Responses were awarded one mark for discussing the role of the musculoskeletal system, such as:

* The musculoskeletal system performs skeletal muscle movement.
* The joints allow for movement.
* The respiratory muscles allow for inhalation and exhalation.

Responses were awarded one mark for discussing the role of the respiratory system, such as:

* The respiratory system provides oxygen, which can be used in the production of ATP.
* The respiratory system allows for inspiration for the uptake of oxygen.

Responses were awarded the final mark for linking the two to mobilisation.

The following example is based on common elements of high-scoring responses:

The respiratory system allows for the intake of oxygen, which can be transferred to the muscles to produce ATP. The production of ATP allows the skeletal muscles to contract, which then allows the muscles to work together to produce mobilisation such as walking.

Question 5a.

|  |  |  |  |
| --- | --- | --- | --- |
| Mark | 0 | 1 | Average |
| % | 26 | 74 | 0.8 |

This question was answered well by most students. The most common errors were responses that described the role of the peripheral nervous system or the sensory systems rather than the central nervous system (e.g. ‘receiving sensory information’).

Acceptable responses included:

* receives/transmits action potentials between the brain and body
* interprets or perceives sensory information from sensory input
* responds to internal and external changes
* consciousness
* higher order / executive functions, such as cognition, thinking, memory and intuition
* initiates motor messages that control movement
* the control of reflexes.

Question 5b.

|  |  |  |  |
| --- | --- | --- | --- |
| Mark | 0 | 1 | Average |
| % | 22 | 78 | 0.8 |

This question was answered very well, with most responses identifying alternative strategies to gain a social history in the context of Alzheimer’s Disease. The most common error was to ask Bernard himself without acknowledging strategies to ensure the accuracy of the information.

Acceptable responses included:

* ask Maria (his wife)
* ask his family
* review past medical records
* ask Bernard simple questions that are repeated over time
* refer to an advanced care directive.

Case study 2

Question 6

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Mark | 0 | 1 | 2 | Average |
| % | 38 | 20 | 42 | 1.1 |

This question was answered reasonably well, with many responses identifying structures in the dermis. The most common errors were responses that stated that the epidermis and/or hypodermis / subcutaneous layer were structures within the dermis; however, these are separate layers of the skin sitting above and below the dermis, respectively.

Acceptable responses included:

* hair follicles
* sweat glands
* sebaceous glands
* nerves
* arteries
* veins
* sensory receptors
* lymphatic vessels
* arrector pili muscles
* blood vessels.

Question 7

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Mark | 0 | 1 | 2 | 3 | 4 | Average |
| % | 1 | 37 | 40 | 18 | 4 | 1.9 |

|  |  |
| --- | --- |
| Abbreviation | Full medical term |
| PO | per oral / by mouth / per os |
| d/c | discharge/discharged |
| NIDDM | non-insulin-dependent diabetes mellitus |
| DOB | date of birth |

Most responses identified date of birth and discharge correctly. Many responses confused PO with ‘post-operatively’ or ‘post-operation’, and many were unable to correctly identify NIDDM.

Question 8

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Mark | 0 | 1 | 2 | Average |
| % | 14 | 45 | 41 | 1.3 |

To gain full marks for this question, responses were required to identify one function of skin and explain the importance of replacing skin if it is lost. Most responses identified a function or indirectly described the importance of replacing lost skin without listing the function. High-scoring responses could coherently synthesise both.

Accepted responses included:

* Skin is a first line of defence / a barrier. Therefore by replacing skin it assists to keep pathogens out or prevents infection.
* Skin contains many blood vessels. Therefore replacing lost skin will promote healing or assist in thermoregulation.
* Skin contains sweat glands. Therefore replacing lost skin will assist thermoregulation.
* Skin provides a barrier to the sun. Therefore replacing lost skin will assist protection against ultraviolet light.

Question 9

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Mark | 0 | 1 | 2 | Average |
| % | 6 | 20 | 74 | 1.7 |

This question was answered well. Marks were awarded for responses that addressed melanoma prevention or general strategies to maintain the integumentary system. However, as the question specifically asked for strategies to protect against UV damage, full marks were not awarded if responses only listed general strategies that did not address sun protection.

Accepted responses included:

* wear sunscreen
* wear long sleeves / a hat / protective clothing outdoors
* minimise time spent outdoors / seek shade
* maintain hydration levels
* adhere to skin graft management advice
* consume a healthy diet
* use a moisturiser
* monitor own skin for changes.

The most common error was to answer that Lawrence should get check-ups with his dermatologist, as it was already stated that his skin is being monitored by a dermatologist.

Question 10a.

|  |  |  |  |
| --- | --- | --- | --- |
| Mark | 0 | 1 | Average |
| % | 33 | 67 | 0.7 |

This question was answered very well. The most common error was to suggest that Lawrence’s diet / high salt diet was contributing to his high blood pressure. However, no information in the case study indicated that Lawrence had a problematic diet. While he was referred to a dietician, it is unclear whether this is in response to his high blood pressure or due to his diabetes and obesity. Similarly, some responses indicated that ‘high stress levels’ were contributing factors, but there is no indication of this in the case study.

Accepted responses included:

* smoking history
* obesity
* diabetes
* alcohol consumption
* age.

Question 10b.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Mark | 0 | 1 | 2 | Average |
| % | 86 | 8 | 7 | 0.2 |

This question was not answered well. To receive full marks for this question, responses needed to describe the function of ADH and then explain how this regulates blood pressure.

The majority of responses to this question were off-topic, and included misconceptions that ADH ‘thins the blood’. Many responses incorrectly stated that ADH is involved in insulin regulation.

The function of ADH is to increase water reabsorption of water in the collecting duct and distal convoluted tubule of the nephron in the kidney. This helps regulate blood pressure by increasing blood volume.

Conversely, responses could have discussed that if ADH release is stopped, water reabsorption in the nephron will decrease, and therefore blood volume will decrease.

Question 10c.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Mark | 0 | 1 | 2 | Average |
| % | 3 | 20 | 76 | 1.8 |

This question was answered well, with most responses awarded marks. Responses could make any general recommendations that would improve Lawrence’s overall health, but they could not name two recommendations from the same general category. For example, two SunSmart recommendations such as ‘wear a hat and sunscreen’ would have scored one out of two marks.

Accepted responses included:

* reduce alcohol intake
* participate in more regular physical activity
* consume a healthy diet / diet rich in fruit and vegetables
* monitor and maintain healthy blood glucose levels
* get regular check-ups with a GP
* lose weight
* improve sleep quality
* adopt SunSmart strategies such as wear sunscreen and a hat.

The main reason responses did not gain full marks was for suggesting actions that Lawrence was already taking, such as quitting smoking.

Question 11

|  |  |  |  |
| --- | --- | --- | --- |
| Mark | 0 | 1 | Average |
| % | 33 | 67 | 0.7 |

Students did well on this question, and it was impressive to see some creative and innovative thinking around strategies to maintain Lawrence’s privacy. The key to success for this question was to ensure that the suggested strategy was implemented while conductingthe home visit.

Marks were not awarded for suggesting actions that would naturally occur after the visit, such as ‘not discussing the nature of the consult with other colleagues directly involved in his care’. As the colleagues are not at the visit, this would not maintain privacy and confidentiality *during* the visit.

Accepted responses included:

* hold the consult in a private room/area
* ensure other family members cannot overhear the consultation
* draw blinds/curtains so passersby cannot observe from the street
* get Lawrence’s consent to have other family members present
* ensure Veronica does not leave Lawrence’s notes unattended anywhere in the house so that other family members cannot read them
* do not discuss other patients with Lawrence while on the visit
* do not take other patients’ notes into the house while on the visit.

While the final two suggestions relate to other patients, these were accepted as the question does not specifically ask how Veronica can maintain **Lawrence’s**confidentiality and privacy.