

2019 VCE VET Health examination report

General comments

The 2019 VCE VET Health examination provided students with an opportunity to demonstrate their knowledge and understanding of two units of competency in the VCE VET Health Program:

- HLTAAP001 Recognise healthy body systems
- BSBMED301 Interpret and apply medical terminology appropriately

The examination consisted of three parts: Section A contained 20 multiple-choice questions, Section B contained 14 questions and Section C contained 2 case studies with 10 questions.

Students need to develop a greater knowledge base of the anatomical structures of the organs of the body systems and the function of each body system and its components. They did not answer well questions relating to topics such as the cardiovascular, endocrine and reproductive systems in Section B and the muscular system in Section C.

Students were generally able to discuss processes and resources required by the body to support healthy functioning; for example in Question 10 in Section C. They were less able to discuss how two systems work together to maintain a healthy body; for example in Question 6b. in Section B or Questions 3 and 7 in Section C).

Students demonstrated an understanding of medical terminology but they need to further improve their knowledge of plural and singular forms of medical terms, common medical abbreviations and the correct spelling of misspelt medical terms. Where the medical abbreviation questions were part of a case study, students would benefit from reading the case study to understand the context in which the abbreviation occurs and then replacing it with its full meaning to see if it makes sense.

Where a question related to a case study, students were generally able to demonstrate their understanding by providing a generic response but they only gained full marks if they had tailored their response to address the case study.

Specific information

Note: Student responses reproduced in this report have not been corrected for grammar, spelling or factual 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 more or less than 100 per cent.

Section A – Multiple-choice questions

The table below indicates the percentage of students who chose each option. The correct answer is indicated by shading.

Question	% A	% B	% C	% D	Comments
1	1	20	44	35	CCU stands for Coronary Care Unit or Critical Care Unit (in American texts/ online dictionaries). As Critical Care Unit was not an option, D is correct.
2	13	56	5	26	
3	23	23	18	36	Proximal refers to being closer to the trunk; the humerus is closer to the trunk than the elbow, so D is correct.
4	10	37	23	30	Option B is correct as arteriostenosis is a narrowing of an artery, whereas arteriosclerosis (option D) is the stiffening or hardening of the artery walls.
5	34	16	28	23	Option A is correct as diaphysis is the shaft of a long bone, whereas the metaphysis (option D) is the narrow portion of a long bone between the epiphysis and the diaphysis.
6	12	66	16	6	
7	12	3	10	74	
8	2	10	26	61	
9	19	45	25	10	Option C is correct as the parietal pleura lines the internal surface of the thoracic cavity. The visceral pleura is the layer that covers the lungs (option B) and the external area of the thoracic cavity (option D) is covered by fascia.
10	3	13	73	12	
11	20	24	23	34	Option A is correct as the two parotid glands are present on either side of the mouth and in front of both ears. The maxillary glands (option B) are located behind the lower jaw, the sublingual salivary glands (option C) are located inferior to the tongue and in front of the submandibular glands, and the submandibular glands (option D) are just under and deep to the jaw, towards the back of the mouth.
12	9	51	24	16	Option C is correct as the root word for tongue is gloss/. Rhin/ (option A) is the root word for nose, palat/ (option B) is the root word for palate meaning roof of the mouth, and odont/ (option D) is the root word for teeth.

Question	% A	% B	% C	% D	Comments
13	34	11	50	4	
14	26	10	55	9	
15	45	26	8	20	
16	57	26	6	11	<p>Option C is correct as the buffer system is the most potent and first line of defence in the regulation of blood pH as it can adapt to abrupt or sudden changes in acidity and alkalinity.</p> <p>The kidneys (option A) help manage acid-base balance by regulating the absorption or excretion of hydrogen and bicarbonate ions and is the third line of defence.</p> <p>Some hormones (option B) act on a short term basis to inhibit or stimulate bicarbonate or hydrogen ion reabsorption or excretion as part of the buffer system.</p> <p>The respiratory system (option D) aids in regulating blood pH by releasing carbon dioxide (acidic) from the lungs and is the second line of defence.</p>
17	6	42	23	29	<p>Option D is correct as the bladder is able to expand as urine accumulates within it due to the presence of transitional epithelium, which can stretch and contract to accommodate fluctuating volumes of urine.</p> <p>Orifices (option A) are an opening in the body, e.g. nose, mouth, ears.</p> <p>The internal and external urethral sphincters (option B) in the bladder control the exit of urine from the bladder through the urethra.</p> <p>Segmentation (option C) is the division of the human body into repeated subunits or segments.</p>
18	67	17	13	3	
19	5	29	24	41	The role of the epididymis is to store, mature and transport sperm, so option B is correct.
20	19	78	3	1	

Section B

Question 1

Marks	0	1	2	3	Average
%	17	22	22	39	1.9

Students answered this question with varying degrees of success. Students could mostly identify the chambers of the heart and the major vessels; however, the pulmonary artery and pulmonary veins were generally labelled incorrectly. Students struggled to correctly identify the tricuspid and

mitral valves and the anatomical orientation (left side and right side) of the heart. Generally, the parts of the heart were spelt correctly.

Question 2

Marks	0	1	2	Average
%	39	41	21	0.8

Some students correctly identified the two main divisions of the nervous system: the CNS (Central Nervous System) and PNS (Peripheral Nervous System). Most students could identify the structures of the CNS – the brain and spinal cord – but fewer were able to identify the structures of the PNS – all of the nerves that lie outside the brain and spinal cord.

No marks were awarded for student responses to the structures of the PNS that included the Autonomic Nervous System and Somatic Nervous System and/or Sympathetic and Parasympathetic Nervous Systems.

The following is an example of a high-scoring response.

Central Nervous System is made of the brain and spinal cord, peripheral nervous system is made of the cranial and spinal nerves that run from the brain/spinal cord to the rest of the body.

Question 3

Marks	0	1	2	3	4	Average
%	57	26	14	3	1	0.7

To receive full marks students were required to identify either a singular or plural form of a stated medical term.

Medical term	Singular form	Plural form
thorax		thoraces
diagnosis		diagnoses
phalanges	phalanx	
thrombi	thrombus	

The singular medical term for thrombi, thrombus, was mostly answered correctly. The plural term for diagnosis and the singular form of phalanges were less frequently answered correctly, while the plural form of thorax was rarely answered correctly.

Question 4

Marks	0	1	2	3	4	5	6	Average
%	4	12	16	25	25	15	3	3.1

To obtain full marks, students were required to match the explanation to a medical term. Most students were able to identify retinopathy as a disease of the retina; however, common errors for the remaining explanations included:

- inflammation of the small intestine is called enteritis; many students answered gastritis, which is inflammation of the lining of the stomach
- abnormal swelling in the wall of a blood vessel is aneurysm; many students answered thrombosis, which is a blood clot in a blood vessel

- collection of air in the pleural cavity is a pneumothorax; some students answered pulmonary embolism, which is a blood clot in one of the pulmonary arteries in the lungs
- cancer of the connective tissue is sarcoma; some students answered glioma which is a type of cancerous tumour in the brain
- surgical removal of an ovary is oophorectomy; many students answered hysterectomy, which is the surgical removal of the uterus.

Question 5

Marks	0	1	2	3	4	5	6	Average
%	48	13	19	9	6	4	1	1.3

Students who scored highly were able to differentiate between the structural and functional properties of the blood vessels in question. They gave clear descriptions of the vessels' structure and function in the correct cells. Students who did not score well were unable to identify the structure and/or function of the three types of blood vessels.

For the structure, students who scored highly were able to describe the thickness of the walls of arteries in comparison to veins, identify that veins also have valves and describe the capillaries as being one cell thick.

For the function, students who scored highly were able to:

- describe the function of veins and arteries
- discuss carrying oxygenated or deoxygenated blood without confusing it with pulmonary circulation, e.g. 'Arteries carry oxygenated blood from the heart to the cells and tissues in the systemic circulation'
- identify that arteries carry blood away from the heart, encompassing the pulmonary artery, and that veins carry blood to the heart, including the pulmonary veins
- identify that capillaries are involved in the exchange of gas and nutrients from the blood stream into the cells and tissues of the body.

Question 6a.

Marks	0	1	Average
%	88	12	0.2

Students who scored highly answered this question by describing blood pressure as the pressure exerted against the artery walls when the heart is contracting and relaxing (systole and diastole).

Student responses that did not gain a mark were often too vague in their description, such as discussing pressure against 'blood vessel walls' rather than arteries. Some students also confused blood pressure as being pressure inside the heart rather than against the artery walls.

The following is an example of a high-scoring response.

Is the force that is exerted against the artery walls by blood on contraction and relaxation of the heart.

Question 6b.

Marks	0	1	2	Average
%	93	6	1	0.1

This question proved to be challenging for most students, as many struggled to conceptually link the role of both the cardiovascular and urinary systems in maintaining blood pressure.

Students who scored highly were able to identify that in the case of hypertension, the cardiovascular system 'dilates blood vessels' to reduce blood pressure, and the urinary system 'reduces the reabsorption of water' into the blood stream.

Mid-range responses often confused hypertension and hypotension and discussed the reabsorption of water but did not connect that this needs to be reduced in the case of hypertension.

Students who did not score well generally provided one function of the cardiovascular system and/or one function of the urinary system with no link to blood pressure or the interrelationship of the two systems in lowering blood pressure.

The following is an example of a high-scoring response.

The C.V. system can decrease blood pressure by dilating blood vessels and slowing the heart beat. The urinary system effects blood pressure by altering the amount of urine produced. (produce more when blood pressure is too high to decrease blood volume).

Question 7

Marks	0	1	2	3	Average
%	16	14	30	40	2.0

This question was relatively well answered. Students on the whole provided the following three systems and their waste products:

- urinary system – urine, urea, water
- respiratory system – carbon dioxide
- digestive system – faeces.

Question 8a.

Marks	0	1	2	3	4	Average
%	26	33	25	12	5	1.4

This question identified a shortfall in students' ability to recognise and rectify spelling errors in common medical terms. The term 'gastroscopy' was the most correctly spelt medical term, whereas 'jaundice' was the most inconsistently answered. American spelling of medical terms, e.g. fecal, was not accepted.

Incorrectly spelt medical term	Correctly spelt medical term
pnumonea	pneumonia
jordis	jaundice
gastroscopee	gastroscopy
fekal	faecal

Question 8b.

Marks	0	1	2	Average
%	71	18	11	0.4

Overall, students did not have a good understanding of the role of haemoglobin in the body as evidenced by a high number of non-attempts.

High-scoring responses identified oxygen attaching or binding to haemoglobin and being transported or carried around the body to cells and tissues.

Mid-range responses stated either that oxygen bound to haemoglobin but did not mention it being transported or that haemoglobin carried oxygen around the body but did not mention that oxygen attached to haemoglobin.

Students who did not perform well discussed haemoglobin as assisting in fighting infection and clotting the blood or carrying nutrients and were awarded no marks.

The following is an example of a high-scoring response.

Haemoglobin is found in red blood cells and it is what oxygen attaches to during gas exchange at the lungs and it transports the oxygen throughout the body so body cells create energy.

Question 9

Marks	0	1	2	3	4	Average
%	42	21	18	11	7	1.2

Many students struggled to provide the correct function of the hormone despite correctly naming the gland and the hormone secreted by that gland.

Students who gained full marks were able to select a gland and identify a hormone the gland secretes and the function of the hormone. For example, 'adrenal gland secretes adrenaline which stimulates a stress or fight or flight response'. Some students misread the question and provided an answer to ovaries/uterus and prostate/testes.

Full marks were awarded to students who stated that insulin lowers blood glucose levels, but no marks were given to students who stated that insulin regulates or maintains blood glucose levels.

Possible responses could have included the following:

Pituitary gland

- growth hormone – regulates growth and physical development
- adrenocorticotrophic hormone – stimulates the adrenal glands to secrete steroid hormones, mainly cortisol
- luteinising hormone and follicle stimulating hormone – they act on the ovaries or testes to stimulate sex hormone production and egg and sperm maturity
- prolactin – stimulates milk production
- thyroid stimulating hormone – stimulates the thyroid gland to secrete thyroid hormones

Thyroid gland

- triiodothyronine (T3) and thyroxine (T4) – regulate body's temperature, metabolism and heart rate
- calcitonin – regulates calcium levels in the body

Parathyroid gland

- parathyroid hormone (PTH) – regulates the amounts of calcium, phosphorus and magnesium in the bones and blood

Adrenal gland

- adrenaline and noradrenaline – responsible for the stress response, the so called 'fight or flight' response
- cortisol – influences metabolism, blood sugar levels and has anti-inflammatory effects

- aldosterone – helps to maintain the body’s salt and water levels which, in turn, regulates blood pressure

Pancreas

- insulin – helps to lower blood glucose levels.

Question 10

Marks	0	1	2	3	Average
%	5	25	61	9	1.8

The variation in responses indicated students did not have a thorough grasp of medical abbreviations. Most students provided the correct meaning for UTI, pt, mg and gm. Common errors included Full Blood Count for FBC, instead of Fluid Balance Chart, and oxygen or once for O, instead of oral or orally.

High-scoring responses provided the correct meaning and spelling, whereas students who did not score well either did not attempt the meaning and/or had incorrect spelling/meaning. Responses that were awarded marks included:

Abbreviation	Full medical term
O/A	on admission
UTI	Urinary Tract Infection
pt	patient
mg	milligram
O	oral, orally
QID	6 hourly; 4 times a day
gm	gram
PRN	when required; as required; as needed; when necessary
FBC	Fluid Balance Chart

Question 11

Marks	0	1	2	3	Average
%	71	10	9	10	0.6

Students were required to compare the female and male secondary sexual characteristics but most listed or contrasted the primary sexual characteristics of both genders. Students who could correctly identify secondary sexual characteristics often displayed a rudimentary understanding and listed rather than compared, so did not achieve full marks. Many, for example, demonstrated no further knowledge than females having a vagina and males having a penis; males’ sexual organs being external whereas females’ sexual organs are internal; or females having high levels of oestrogen whereas males have high levels of testosterone.

Students who listed and did not compare secondary sexual characteristics were awarded some marks but needed to compare three secondary sexual characteristics to gain full marks; for example ‘Females have more subcutaneous fat and fat deposits whereas males have lower body fat percentage on average’.

Possible responses could have included the following:

Female

- enlargement of breasts / mammary glands
- growth of body hair, most prominently underarm and pubic hair
- widening of hips
- smaller waist
- face is more rounded, with softer features
- changed distribution in weight and fat; more subcutaneous fat and fat deposits, mainly around the buttocks, thighs and hips.

Male

- growth of body hair, including underarm, abdominal, chest and pubic hair
- growth of facial hair
- enlargement of larynx (Adam's apple) and deepening of voice
- increased stature; adult males are taller than adult females, on average
- heavier skull and bone structure
- increased muscle mass and strength
- growth in hands, feet and nose
- growth in body
- more angular facial features, with more square face
- broadening of shoulders and chest; shoulders wider than hips
- coarsening or rigidity of skin texture due to less subcutaneous fat
- lower body fat percentage than prepubescent or adult females or prepubescent males, on average.

Question 12

Marks	0	1	2	Average
%	81	15	4	0.3

Students were required to list the structures that make up the ossicles of the inner ear and describe their function. Overall responses demonstrated a lack of knowledge and understanding of the structure and function of the inner ear, with few students being awarded full marks.

Many students who could name the structures of the inner ear often spelled them incorrectly and received no marks. Structures accepted included:

- malleus or hammer
- incus or anvil
- stapes or stirrup.

Many students were able to provide a simple description of the function of the ossicles such as 'to transmit sound to the inner ear or the brain'. These students were not awarded marks. To gain full marks students were required to answer more comprehensively to demonstrate understanding; for example, 'to transmit sound or vibrations to the cochlea or oval window'.

Question 13

Marks	0	1	2	3	4	Average
%	44	20	15	14	7	1.2

This question was not well answered by the majority of students. Students did not provide correct responses to the meaning of the word and/or incorrectly broke down the medical term into its word parts. If either or both sections were incorrect, no marks were awarded.

The definitions of nephritis and craniotomy were mostly inaccurate, followed by polyneuropathy. Nephritis was described as 'inflammation of the nephron' instead of 'inflammation of the kidney'; craniotomy as 'removal of the brain or surgical opening of the brain' instead of 'incision into the skull or cranium'; and polyneuropathy as 'many diseases of nerves/neurons' instead of 'disease of many nerves/neurons'.

Hypoglycaemia was the medical term that students struggled most to break down into its component parts correctly, listing them as hypo (prefix) – glycaem (root) – ia (suffix). The correct response was hypo (prefix) – glyc (root) – aemia (suffix). The definition required was low blood sugar or condition of low glucose in the blood. Some students stated high blood sugar or regulation of blood sugar and were not awarded marks.

Question 14

Marks	0	1	Average
%	77	23	0.3

This question challenged the majority of students. Students who scored highly defined homeostasis as maintaining a stable or constant internal environment irrespective of the external environment. Those who stated homeostasis regulates or maintains the body's temperature and/or pH within normal range were not awarded a mark.

The following is an example of a high-scoring response.

Homeostasis is the body's ability to maintain a stable internal environment by adapting to constantly changing external conditions.

Section C

Case study 1

Question 1

Marks	0	1	2	Average
%	20	35	46	1.3

This question was answered reasonably well. Some students mixed up the active and passive exercise or provided a definition of an active and a passive exercise; these responses were not awarded marks.

Some responses identified leg extension as the passive exercise, but were not awarded any marks if they did not include 'with towel stretch' to imply the passive element of the exercise.

Students who identified squats or hamstring curls as an active exercise gained a full mark.

Question 2

Marks	0	1	2	Average
%	82	10	9	0.3

Most students did not attempt this question. Of the students who did respond, many were able to provide the correct abbreviation (most commonly ACL and PCL) but not the full medical term, or incorrectly spelt the full medical term. These responses were awarded one mark.

Students who scored highly were able to identify and correctly spell the ACL (Anterior Cruciate Ligament), the PCL (Posterior Cruciate Ligament) or the MCL (Medial Collateral Ligament).

Question 3

Marks	0	1	2	Average
%	59	30	11	0.6

Very few students were able to explain the relationship between the muscular and the skeletal systems. Students who scored highly identified the interdependent nature of the two systems, making specific reference to muscles being attached to bone and that muscular contraction or pulling results in movement.

Common responses suggested that the purpose of the skeletal system is to 'protect' and that the muscular system is for 'movement and posture'. They were awarded no mark.

Question 4

Marks	0	1	2	3	Average
%	14	24	4	58	2.1

Most students were able to obtain full or part marks in this question, with many high-scoring responses. Low-scoring responses were often due to the student making one error, which resulted in two columns being incorrect.

Students needed to pay attention when reading the question. Many responses showed more than one box ticked. These responses received no marks.

Question 5

Marks	0	1	2	3	4	Average
%	23	29	40	3	5	1.4

Students did not perform well in this question. They mostly misread the question and responded with answers well outside the scope of handling a medical record within a workplace, e.g. talking about Samir in public or to others not involved directly in his care. Such responses did not gain marks as the question related to the handling of Samir's medical record.

Possible responses could have included the following along with a justification for each response.

- secure storage
- file/lock away immediately after use
- face down during the therapy session
- keep file out of view of the public
- don't leave the file unattended
- with electronic records, ensure password protection and lock computer when unattended

- read/abide by organisational policy and procedure.

The following is an example of a high-scoring response.

Kylie should always return the records to the designated location when not in use and refrain from leaving them lying around to prevent Samir or any other unauthorised persons from having access to the sensitive information. Kylie should ensure that when filling out or accessing Samir's records she does so in a responsible manner, ensuring no other unauthorised persons can read or view the file as she writes. E.g. a visitor or inpatient reading over Kylie's shoulder in the hospital café.

Question 6

Marks	0	1	2	Average
%	9	41	50	1.4

This question was well answered with most students able to correctly provide two different ways in which to find out the meaning of medical terms. Low-scoring responses were too broad and not specific to medical terminology, e.g. 'google it', 'look it up', 'research it', 'ask a friend' or 'search the internet'. These responses did not gain any marks.

Possible responses could have included the following.

- medical terminology dictionary
- medical terminology website
- supervisor or manager
- colleague e.g. physiotherapist
- organisation-approved medical abbreviation document

Case study 2

Question 7a.

Marks	0	1	2	3	4	Average
%	50	25	14	7	3	0.9

This question required students to conceptually understand the role of the cardiovascular and integumentary systems in the maintenance of body temperature. Connecting information from multiple concepts was very difficult for many students.

Students who scored highly were able to identify that the cardiovascular system regulates body temperature by 'dilating blood vessels' to 'radiate heat' out into the environment. They were also able to identify that the integumentary system regulates body temperature by 'releasing sweat from the sweat glands onto the skin' which then 'evaporates' off the body cooling Sarah down.

Students who did not gain full marks often described sweating and dilation of blood vessels but did not further explain how this cools the body down or lowers body temperature.

The following is an example of a high-scoring response.

The integumentary system regulates body heat by secreting sweat which cools the body down via evaporative cooling (convection). It also works with the cardiovascular system to vasodilate blood vessels in the dermis so that bodily heat from the core can be expelled by radiation, since blood is to reach closer to the surface, regulating high body temperatures.

Question 7b.

Marks	0	1	2	Average
%	41	47	12	0.7

High-scoring responses were able to identify that the skin has functions other than temperature regulation, including:

- protection as the first line of defence
- protects against dehydration
- acts as a sensory organ for touch, pressure, pain, heat and cold
- synthesises vitamin D.

Low-scoring responses typically provided the same answer, such as protection, twice, by saying (1) it was the first line of defence, and (2) protects the organism by encasing organs. This response only scored one mark as it was an elaboration on the same point.

Many students who did not gain full marks discussed thermoregulation and waste elimination properties of the skin despite the question requesting a function other than temperature regulation and waste elimination.

Question 8

Marks	0	1	2	3	Average
%	88	9	2	2	0.2

Students were challenged by this question with many non-attempts or responses that highlighted students' lack of understanding of fluid balance.

Low-scoring responses generally discussed Sarah drinking more water to increase her blood volume and made no mention of the kidneys, aldosterone or anti-diuretic hormone.

Some students identified that the kidneys played a part in water regulation by reducing the production of urine and retaining water. The very few high-scoring responses extended this by describing the role of the anti-diuretic hormone (ADH) or aldosterone in increasing blood volume and were awarded full marks.

The following is an example of a high-scoring response.

The hypothalamus recognises that blood volume is too low and that Sarah is dehydrated, so it signals to the adrenal cortex and the pituitary gland to release aldosterone and antidiuretic hormone (ADH) respectively. These hormones act on the nephron unit of the kidneys. ADH causes more water to be reabsorbed into the blood and aldosterone causes the reabsorption of salt, which attracts water. These two hormones therefore increase blood volume and will help to combat Sarah's dehydration.

Question 9

Marks	0	1	2	Average
%	11	45	44	1.4

This question was reasonably well answered with many students gaining half or full marks. Responses that were awarded marks included the following.

Abbreviation	Full medical term
5/24	five hours
c/o	complaining of/complains of
O/E	on examination
Dx	diagnosis/diagnoses

Question 10

Marks	0	1	2	3	4	Average
%	24	17	23	23	14	1.9

This question was answered moderately well, with most students scoring half to full marks. High-scoring responses identified two different strategies to prevent sunburn for the integumentary system and two different strategies to prevent dehydration and heat stroke for the cardiovascular system.

Students who did not score well usually confused the two systems and provided examples such as 'drink water' for the integumentary system rather than for the cardiovascular system. Typically, marks were lost when students responded with 'rote learned' strategies to support each system, but didn't apply them to the specific scenario of sunburn, dehydration and heat stroke for the two systems in question.

Possible responses could have included the following:

- Integumentary system
 - slip, slop, slap
 - cover up (wear sunglasses, clothes)
 - apply sunscreen frequently
 - wear a hat that provides shade
 - shade – sit under a tree, beach umbrella, sunshade
 - avoid the sun in the middle of the day
- Cardiovascular system
 - avoid or limit alcohol or caffeine
 - drink plenty of water
 - drink an electrolyte replacement drink
 - eat fruit and vegetables to increase water content
 - reduce carbohydrates and fats as they take longer to digest
 - reduce intake of salty foods.