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Curriculum Council

Tertiary Entrance Examination, 2001

Question/Answer Booklet

HUMAN BIOLOGY

Please place your student identification label in this box

Student Number: In figures

In words

Time allowed for this paper

Reading time before commencing work: Ten minutes
Working time for paper: Three hours

Materials required/recommended for this paper

To be provided by the supervisor

This Question/Answer Booklet
Separate Multiple Choice Answer Sheet
Question Sheet for Part III (inside front cover of this Question/Answer Booklet)

To be provided by the candidate

Standard items: Pens, pencils, eraser or correction fluid, ruler

Special items: A 2B, B or HB pencil for the separate Multiple Choice Answer Sheet. Calculators satisfying the conditions set by the Curriculum Council for this subject.

Important note 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 notes or other items of a non-personal nature in the examination room. If you have any unauthorised material with you, hand it to the supervisor **before** reading any further.

Ref: 480

Structure of this paper

Part		No. of questions available	No. of questions to be attempted	Marks available
I	Multiple choice	40	All	80
II	Diagram and short answer questions	9	All	80
III	Extended answer questions:			
	Section A	2	1	20
	Section B	2	1	20
			Total marks	200

Instructions to candidates

1. The rules for the conduct of Tertiary Entrance Examinations are detailed in the booklet *TEE Handbook*. Sitting this examination implies that you agree to abide by these rules.

2. Answer the questions according to the following instructions:
   Part I Answer **all** questions, using a 2B, B or HB pencil, on the separate Multiple Choice Answer Sheet. Do **not** use a ball point or ink pen.

   Part II and III Write your answers in the spaces provided in this Question/Answer Booklet. A blue or black ball point or ink pen should be used. Draw any diagrams in pencil.

   The questions for Part III have been repeated on a removable sheet which is inserted into the front of this booklet so that you can refer more easily to the questions while answering.

3. Spare answer pages may be found at the end of this booklet. If you need to use them, indicate in the original answer space where the answer is continued (ie give the page number).

4. You should note that the space made available for an answer is **not** necessarily an indication of the length of the answer.

5. You must not take this Question/Answer Booklet away from the examination room.

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HUMAN BIOLOGY TERTIARY ENTRANCE EXAMINATION 2001

QUESTION SHEET FOR PART III

Extended Answers (40 marks)

Answer **ONE** question from **SECTION A** and **ONE** question from **SECTION B**. Illustrate your answers with diagrams where appropriate. Up to **TWO MARKS** may be deducted for poorly structured answers: that is, answers in point form or diagrams not explained in the text of your answers. **DO NOT WRITE ANSWERS IN PENCIL**. Write your answers on the lined pages in your Question/Answer booklet following the end of the questions.

SECTION A

ANSWER EITHER QUESTION 50 OR QUESTION 51—NOT BOTH

QUESTION 50 (Total 20 marks)

(a) Describe the regulation of normal (tidal) breathing in a healthy individual. Include in your answer the effect of a slight increase in carbon dioxide on normal breathing. (12)

(b) A swimmer routinely hyperventilates before a race because he believes he is able to "suck some oxygen into my lungs, so I can swim longer without having to take a breath." Use your knowledge of the regulation of breathing to explain what happens during hyperventilation, why the swimmer is quite incorrect in his belief that it enables him to swim longer, and why hyperventilation could be quite dangerous for the swimmer. (8)

OR

QUESTION 51 (Total 20 marks)

(a) Heroin abuse remains a major social health problem in Australia and other Western societies. Describe the effects of heroin on the body and how these can lead to addiction. (5)

(b) Describe the major social effects of heroin addiction. (5)

(c) A new drug called buprenorphine has been put forward as a possible treatment for heroin addiction but has not been fully evaluated.

Design an experiment to evaluate the effectiveness of buprenorphine as a treatment for heroin addiction. You are limited to using 200 people in your experiment, and their participation is limited to 6 months. Include in the description of your experiment the:

hypothesis being tested;
the dependent and independent variables;
control and experimental groups;
controlled variables;
how you could reduce experimental error. (10)

SECTION B

ANSWER EITHER QUESTION 52 OR QUESTION 53—NOT BOTH

QUESTION 52 (Total 20 marks)

A near-complete fossil skeleton was recently discovered in the Olduvai region of East Africa. Initial anatomical analyses suggest that the fossilized skeleton is that of a *Homo habilis*. This identification is further supported by its dating to 1.8 million years BP.

(a) Describe the likely anatomical features of the fossilized skeleton that lead to the conclusion it was *Homo habilis* (and not some other species). (5)

(b) Tools consistent with *Homo habilis* were also found in the vicinity of the fossilised skeleton. Describe the tool culture associated with *Homo habilis*; include in your answer what these tools may have looked liked and how their use reflected the lifestyle assumed for *Homo habilis*. (5)

(c) Discuss how tools subsequently changed with the emergence of *Homo erectus* and *Homo sapiens neanderthalensis*. (10)

OR

QUESTION 53 (Total 20 marks)

Demographic transition occurs when a country moves from being less developed to being developed. Describe and explain the population growth and age structure of a country

(a) before the demographic transition has occurred and (10)

(b) after the demographic transition has occurred. (10)

PART I **(80 marks)**

Mark your answers to Questions 1-40 on the **SEPARATE MULTIPLE CHOICE ANSWER SHEET**, using a 2B, B or HB pencil. If you make an error, follow the instructions given to you on the answer sheet.

SELECT THE SINGLE CORRECT ALTERNATIVE IN EACH OF THE FOLLOWING QUESTIONS

1. Chemicals secreted by cells into the extracellular fluids and which regulate the metabolism of other cells in other regions of the body are called

   (a) enzymes.
   (b) antibodies.
   (c) hormones.
   (d) neurotransmitters.

2. The body's central control of temperature (thermoregulation) is

   (a) by a combination of shivering and sweating.
   (b) through a thermostat in the hypothalamus.
   (c) set by homeostatic mechanisms in the cerebellum.
   (d) set via reflexes from receptors in the major brain arteries.

3. The spinal cord has white matter

   (a) inside, grey matter outside.
   (b) outside, grey matter inside and a ventral motor root.
   (c) outside, grey matter inside and a dorsal motor root.
   (d) inside, grey matter outside and a ventral motor root.

4. In response to a stressful stimulus, the adrenal medulla increases secretion of

   (a) glucocorticoids.
   (b) glucagon.
   (c) adrenaline.
   (d) adrenocorticotrophic hormone.

5. The ossicles are the major structures of the

   (a) cochlea.
   (b) middle ear.
   (c) inner ear.
   (d) semicircular canals.

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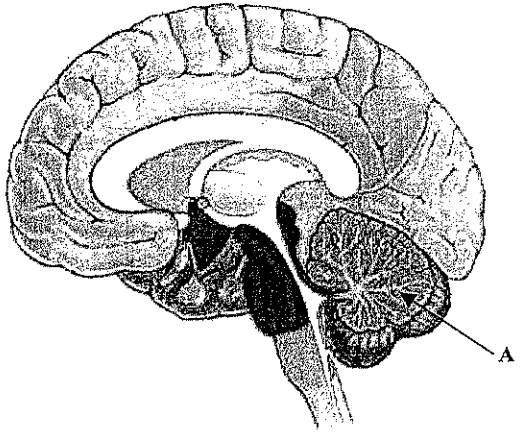
6.



Damage to structure A in the above figure of the brain would result in

(a) uncoordinated movement.
(b) loss of memory.
(c) inability to regulate breathing.
(d) impaired hearing.

7. Homeostasis is the mechanism by which the body maintains

(a) a dynamic physiological state within an unlimited range.
(b) a relatively stable internal environment, within limits.
(c) a static physiological state with no deviation from preset points.
(d) the lowest possible usage of energy.

8. Receptors for hearing are located in the

(a) tympanic membrane.
(b) semicircular canals.
(c) vestibule.
(d) cochlea.

9. Calcium levels in the blood are controlled by hormones secreted by the

(a) hypothalamus.
(b) anterior pituitary gland.
(c) pancreas.
(d) parathyroid glands.

10. When bloo. .gar levels are too high, insulin is released from the pancreas

(a) and stimulates glycogen breakdown in the liver.
(b) in response to increased glucagon levels in the blood.
(c) in response to adrenalin.
(d) and stimulates glycogen formation in the liver.

11. Direct transfer of energy through physical contact is called

(a) radiation.
(b) conduction.
(c) convection.
(d) evaporation.

12. A mechanism for increased heat loss is

(a) peripheral vasodilation.
(b) decreased sweat gland activity.
(c) shivering.
(d) increased metabolism.

13. As substances in the proximal convoluted tubule of the kidney are reabsorbed they move from

(a) peritubular capillaries to filtrate, to epithelial cells, to interstitial fluid.
(b) peritubular capillaries to interstitial fluid, to epithelial cells, to filtrate.
(c) filtrate to peritubular capillaries, to epithelial cells, to interstitial fluid.
(d) filtrate to epithelial cells, to interstitial fluid to peritubular capillaries.

14. The greatest amount of water loss by the body under normal conditions is by

(a) sweating.
(b) breathing out water vapour.
(c) urine.
(d) faeces.

15. A person becomes thirsty when

(a) osmotic changes stimulate the hypothalamus.
(b) salt levels in the body decrease.
(c) the mouth is dry.
(d) the posterior pituitary gland releases increased amounts of ADH.

16. The cells of the kidney's collecting duct are permeable to water. An increase in this permeability is due to

(a) a decrease in the production of ADH.
(b) an increase in the production of ADH.
(c) a decrease in the concentration of the blood plasma.
(d) an increase in the production of aldosterone.

17. The adrenal cortex secretes both

(a) adrenocorticotrophic hormone and cortisol.
(b) adrenaline and luteinizing hormone.
(c) noradrenaline and oestrogen.
(d) aldosterone and cortisol.

18. As blood flows through the glomerulus

(a) most plasma proteins are transferred to the glomerular capsule.
(b) about 20% of plasma is filtered into the glomerular capsule.
(c) its plasma volume increases as fluid enters from the glomerular capsule.
(d) about 20% of the red blood cells pass into the glomerular capsule.

19. Which of the following lists the structures of the nephron in the correct order of fluid flow?

(a) Glomerular capsule, distal convoluted tubule, loop of Henle, proximal convoluted tubule.
(b) Proximal convoluted tubule, loop of Henle, distal convoluted tubule, glomerular capsule.
(c) Glomerular capsule, proximal convoluted tubule, loop of Henle, distal convoluted tubule.
(d) Distal convoluted tubule, loop of Henle, proximal convoluted tubule, glomerular capsule.

20. A key component of cell-mediated immunity is the body's production of

(a) antigens.
(b) killer T cells.
(c) antibodies.
(d) memory B cells.

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21. Which of the cell types listed below is one of the initial targets of the HIV virus?

(a) Macrophages.
(b) Red blood cells.
(c) B cells.
(d) Plasma cells.

22. A child receiving antibodies from its mother's breast milk develops

(a) naturally acquired passive immunity.
(b) artificially acquired active immunity.
(c) artificially acquired passive immunity.
(d) naturally acquired active immunity.

23. T cells and B cells are both

(a) phagocytes.
(b) erythrocytes.
(c) thymocytes.
(d) lymphocytes.

24. In a mating between a man with genotype *Dd* and a woman with genotype *dd*, the expected proportion of homozygotes among their offspring is

(a) 25 percent
(b) 50 percent
(c) 75 percent
(d) 100 percent

25. Mutations to genes on the sex chromosomes are likely to be expressed

(a) equally in males and females.
(b) more frequently in females.
(c) more frequently in males.
(d) not at all, because they are invariably lethal.

26. An allele is best defined as

(a) a lethal recessive phenotype.
(b) a lethal dominant phenotype.
(c) a type of gene only found on one sex chromosome.
(d) an alternative form of a gene at a given locus.

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27. Albinism is inherited as an autosomal recessive trait. If a person has albinism and is married to a person who is heterozygous for the trait

(a) there is a 50% chance of having a child with albinism.
(b) there is a 25% chance of having a child with albinism.
(c) there is a 75% chance of having a child with albinism.
(d) there is no chance of having an albino child.

28. The genotype of an individual

(a) is always the same as the phenotype.
(b) refers to the visible traits of the individual.
(c) refers to the composition of the genes.
(d) is indicated by the presence of either an X or Y chromosome.

29. An object found among prehistoric remains, which was clearly made by humans, is best described as

(a) a fossil.
(b) an artefact.
(c) an artifice.
(d) evidence for culture.

30. *Homo erectus*

(a) was not the first hominid to use fire.
(b) invaded Europe and replaced *Homo neanderthalensis*.
(c) was the most widely distributed hominid and persisted for the longest time.
(d) was succeeded by *Homo habilis*.

31. The half-life of carbon-14 is 5730 years. When an organism dies, the time taken for its carbon-14 to decline to 12.5% of the original

(a) depends on the amount of carbon originally present.
(b) is 17190 years.
(c) is 5014 years.
(d) is 22920 years.

32. The depth of fossils in different layers of an archaeological site gives information on the

(a) relative ages of the fossils.
(b) absolute ages of the fossils.
(c) types of species of animals living at the time.
(d) number of species of animals living at the time.

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33. People living in small island communities for a number of generations without significant immigration sometimes exhibit unusual levels of genetic diseases due to recessive mutations. This is due to

(a) founder effects from the original first settlers.
(b) a diet lacking in essential antioxidants.
(c) high levels of radiation causing mutations.
(d) elevated levels of genetic mutations accumulating in the population.

34. Siblings in a family may show marked inherent variations in skin and hair colour because

(a) they differ in the amount of time they spend in the sun.
(b) these factors are determined polygenically.
(c) dark colouration is a dominant trait.
(d) skin colour is related to blood group.

35. An endomorphic body shape evolved in Eskimos most likely because it provides for a

(a) lower surface area to volume ratio and thus reduced heat loss.
(b) higher surface area to body ratio and thus reduced heat loss.
(c) lower surface area to volume ratio and thus more efficient heat loss.
(d) higher surface area to volume ratio and thus more efficient heat loss.

36. From the **biological** perspective, the concept of race is flawed because

(a) much biological variation is continuous.
(b) different races have distinctly different body shapes.
(c) racial classifications can lead to discrimination.
(d) different races have distinctly different skin colours.

37. The Green Revolution

(a) has resulted in increased levels of nutrition for people in less-developed countries.
(b) has reduced famine caused by war or natural disasters.
(c) led to increased agricultural yields due to improved methods of cultivation, harvesting and food processing.
(d) is the result of planting more crop plants and using increased amounts of fertilisers in soil.

38. Urbanization

(a) is caused by an increasing population density.
(b) developed about 12,000 years ago in South-West Asia.
(c) led to the domestication of plants and animals.
(d) is the movement of people from rural areas into cities.

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39. Recycling is the treatment of waste materials so that they can be re-used. Which of these statements about the need for recycling is **CORRECT**?

(a) Most resources are finite and recycling is essential to preserve them.
(b) Environmental deterioration is an acceptable side effect of recycling.
(c) More energy is required in the recycling process than is required to collect new resources.
(d) The extraction and collection of raw materials results in less pollution than the recycling process.

40. Water pollution

(a) is primarily caused by volatile pollutants such as chlorofluorocarbons.
(b) can result in diseases such as cholera and dysentery being spread.
(c) is less of a problem in countries with ineffective sewage disposal.
(d) is a major cause of global warming.

END OF PART I

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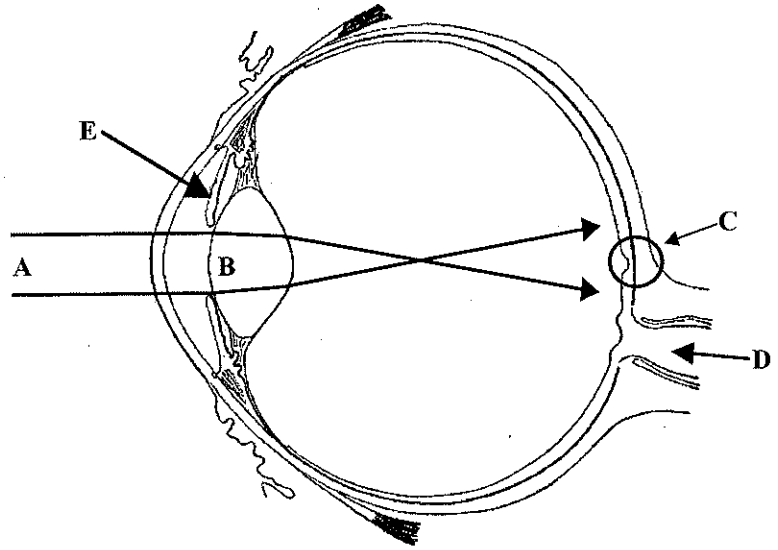
PART II (80 marks)

Write answers to ALL questions on the ruled lines after each question or in the spaces provided within each table. Write your answers in blue or black ballpoint or ink pen.

QUESTION 41 (Total 12 marks)

The diagram below shows a human eyeball in longitudinal section.



(a) The arrows starting at A indicate a possible light pathway through the eyeball. What type of sight defect is being illustrated here?

_____ (1)

(b) What is structure B?

_____ (1)

(c) Apart from B, name **TWO** other components of the eye that bend (refract) the light passing into it.

_____

_____ (2)

(d) What specific region of the retina is the arrow pointing to at C (circled)?

_____ (1)

(e) What type of photoreceptor is present in the highest concentration in C?

_____ (1)

(f) What is special about this region of the retina for normal human vision?

_____ (1)

(g) Name structure D.

_____ (1)

(h) What is the function of structure D?

_____ (1)

(i) Name structure E.

_____ (1)

(j) Describe the effect that structure E has on the pupil in response to bright and to dark light conditions.

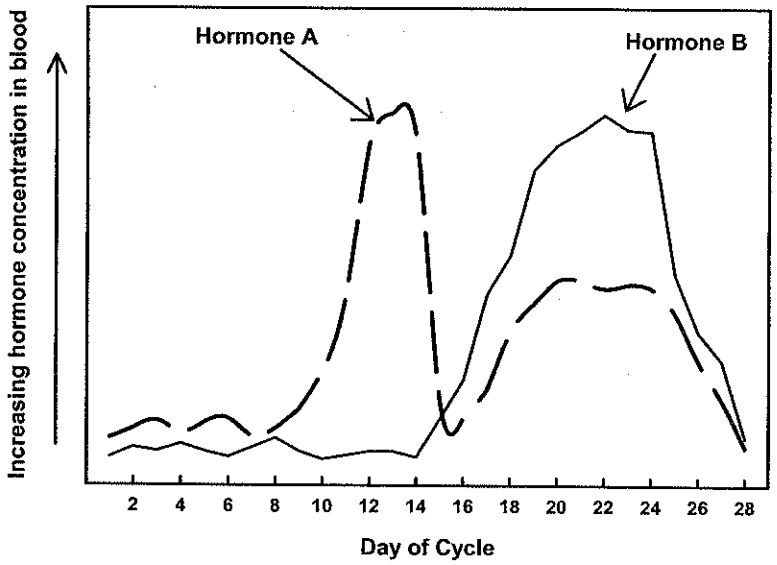
_____

_____

_____ (2)

QUESTION 42 (Total 8 marks)

The graph below shows the concentration of two steroid hormones, labelled Hormone A and Hormone B, in the blood of a human female over the course of a single 28-day menstrual cycle. Use this graph to answer the questions below.



(a) Identify hormone A.

_____ (1)

(b) Identify hormone B.

_____ (1)

(c) Over what 3-day period does the concentration of hormone A rise the most?

_____ (1)

(d) What important event has occurred on about day 14?

_____ (1)

(e) Name the ocrine gland that secretes hormone B.

_____ (1)

(f) What is the major hormonal stimulus for the rise in hormone B?

_____ (1)

(g) In this particular woman, on what day does the concentration of hormone B reach its peak?

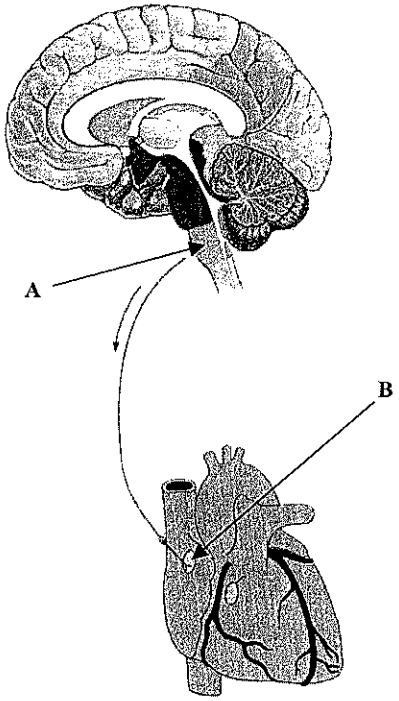
_____ (1)

(h) On what day does hormone B begin its major premenstrual decline?

_____ (1)

QUESTION 43 (Total 8 marks)

(a) The diagram below shows a relationship between a part of the brain and the heart. Use the diagram to answer the following questions.



(i) Name the part of the brain labelled A.

_____ (1)

(ii) Name the mass of specialised cells labelled B.

_____ (1)

(iii) When a person suddenly becomes frightened, what happens to their heart rate?

_____ (1)

(iv) This change in heart rate is brought about by the _____ branch of the autonomic nervous system. *(Insert correct word.)* (1)

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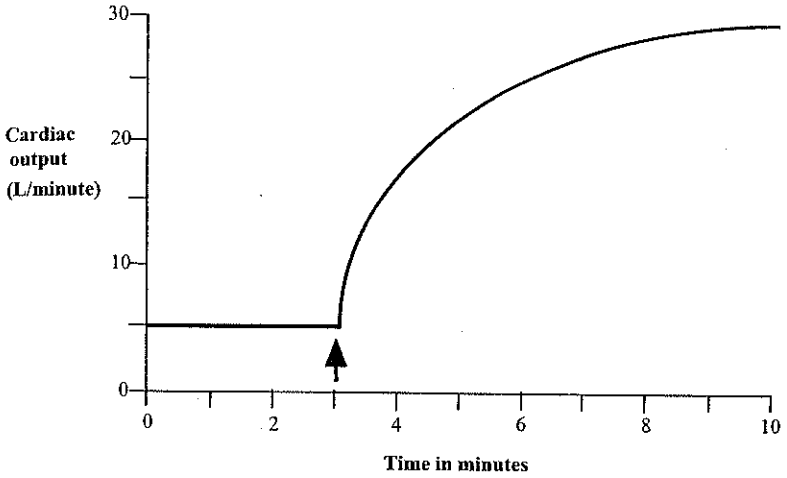
(b) The graph below shows a measurement of a person's cardiac output, first at rest, then after starting to exercise (arrow).



(i) Define what is meant by **cardiac output.**

_____

_____ (1)

(ii) What was the cardiac output at rest?

_____ (1)

(iii) What was the cardiac output three minutes after beginning exercise?

_____ (1)

(iv) The rise in cardiac output is due to the combined effects of an increase in heart rate and an increase in **WHAT OTHER VARIABLE** of heart function?

_____

_____ (1)

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QUESTION 44 (Total 10 marks)

The table below shows the percentage composition of certain materials in plasma and urine from a healthy individual.

Substance	Plasma	Urine
	%	%
Water	90-93	95.0
Proteins & fats	6.0	0.0
Glucose	0.1	0.0
Sodium	0.32	0.35
Potassium	0.02	0.15
Urea	0.03	2.0
Creatinine	0.001	0.075

(a) Account for the following patterns between plasma and urine shown in the table by referring to nephron function and **WHERE** in the nephron these processes are taking place.

(i) The **DECREASE** in percentage composition for glucose.

_____

_____ (2)

(ii) The **INCREASE** in percentage composition for urea.

_____

_____

_____ (3)

(b) Explain why the percentage composition of proteins and fats in urine is zero.

_____

_____ (2)

(c) The metabolic waste product, urea, is produced by the process of deamination. Describe **WHERE** and **HOW** this process occurs.

_____

_____

_____

_____ (3)

QUESTION 45 (Total 10 marks)

A person was injected on two occasions with an attenuated pathogen for rubella.

The **FIRST** injection was administered on Day 0 and within 14 days symptoms of the disease occurred but subsided by the end of the third week. During these three weeks the person's blood was tested daily for specific antibody to rubella.

The **SECOND** injection of the same antigen was given at the end of the third week and for a further four weeks the concentration of specific antibody for rubella was measured in the person's blood.

(a) Explain the meaning of the term "attenuated pathogen".

_____

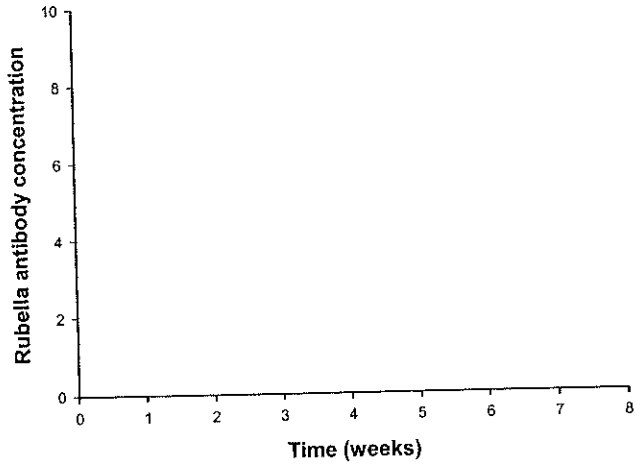
_____

(2)

(b) Using the axes provided below, **SKETCH** a graph to show the relationship between time and the concentration of rubella antibody in the blood of the person injected. The time scale on the graph should be from Day 0 to the end of the seventh week.

(3)

Graph showing rubella antibody concentration over time



(c) What is the purpose of the first injection?

_____

(1)

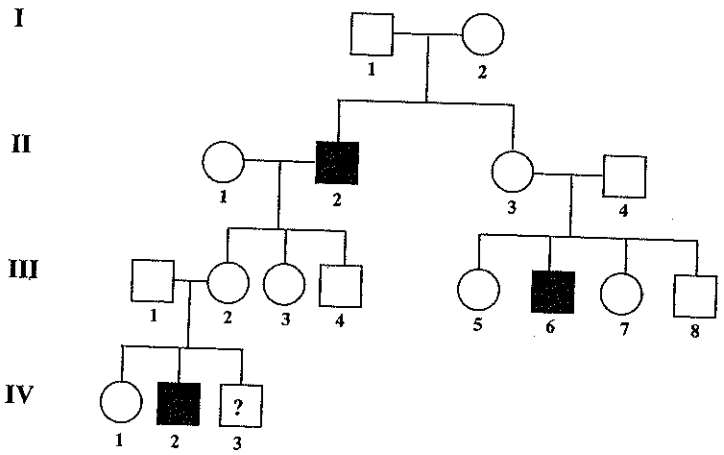
(d) In the table below, briefly explain how each of the cell types listed contributes to the response of the immune system to the rubella vaccine.

Cell type	Contribution to immune response
Macrophage	
Helper T cell	
Memory B cell	
Plasma cell	

(4)

QUESTION 46 (Total 11 marks)

Question 46 relates to the pedigree shown below. This shows the inheritance, within a family, of a very rare disorder. Individual IV.3 is a newborn baby who has not yet been tested for the disorder.



(a) Is the disorder inherited as a dominant or recessive trait? _____ (1)

(b) Explain how you arrived at your answer in (a).

_____

_____ (1)

(c) Is the trait **more likely** to be autosomal or X-linked?

_____ (1)

(d) Explain how you arrived at your answer in (c).

_____

_____ (1)

(e) Using the letters 'A' and 'a' to represent dominant and recessive alleles, respectively, write the full genotype of individual I.2.

_____ (1)

(f) What is the chance that the newborn baby (individual IV.3) has the disorder?

_____ (1)

(g) The ABO blood grouping system displays two phenomena in genetics.
Explain the following terms and give an example using the ABO system.

(i) Multiple alleles

_____

_____ (2)

(ii) Co-dominance

_____

_____ (2)

(h) Apart from the ABO system, name **ONE** other blood grouping system.

_____ (1)

QUESTION 47 (Total 9 marks)

(a) Complete the following table about these three primate species:

Species	Position of foramen magnum	Shape of dental arcade
Chimpanzee		
Homo erectus		Parabolic
Homo sapiens		

(5)

(b) Explain why the position of the foramen magnum in *Homo sapiens* is adaptive for bipedalism.

_____

_____

(2)

(c) Some features of the human hand have evolved to perform unique functions.

(i) Name the type of hand grip that is unique to humans.

_____

(1)

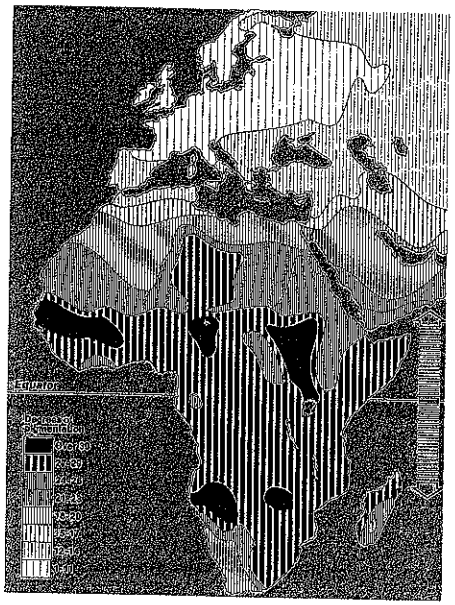
(ii) State one adaptation of the human hand that enables this type of grip.

_____

(1)

QUESTION 48 (Total 5 marks)

Question 48 relates to the figure below showing the distribution of skin colour from the equator to northern Europe, with pigmentation over 30 being extremely dark. Use this information to answer the following questions.



(a) Explain why this figure may be described as a "clinal zone".

_____

(1)

(b) Describe the adaptive significance of skin colour for populations living near the Equator.

_____

_____

(2)

(c) A person from northern Europe visits equatorial Africa. Name **ONE** effect that this could have on their skin and **EXPLAIN WHY** this effect might occur.

_____

_____

(2)

QUESTION 49 (Total 7 marks)

A key event in the cultural evolution of humans occurred w... the nomadic hunter-gatherer lifestyle was gradually replaced by an agricultural economy.

(a) (i) Explain **ONE** disadvantage of the nomadic lifestyle to the people involved.

(1)

(ii) Explain **ONE** advantage of the nomadic lifestyle to the people involved.

(1)

(b) Explain the process by which industrialisation has contributed to the Greenhouse Effect.

(3)

(c) Describe **TWO** environmental changes likely to result from the Greenhouse Effect.

(2)

END OF PART II

PART III **(40 marks)**

Answer **ONE** question from **SECTION A** and **ONE** question from **SECTION B**. Illustrate your answers with diagrams where appropriate. Up to **TWO MARKS** may be deducted for poorly structured answers: that is, answers in point form or diagrams not explained in the text of your answers. **DO NOT WRITE ANSWERS IN PENCIL**. Write your answers on the lined pages in your Question/Answer booklet following the end of the questions.

SECTION A

ANSWER EITHER QUESTION 50 OR QUESTION 51—NOT BOTH

QUESTION 50 (Total 20 marks)

(a) Describe the regulation of normal (tidal) breathing in a healthy individual. Include in your answer the effect of a slight increase in carbon dioxide on normal breathing. (12)

(b) A swimmer routinely hyperventilates before a race because he believes he is able to "suck some oxygen into my lungs, so I can swim longer without having to take a breath." Use your knowledge of the regulation of breathing to explain what happens during hyperventilation, why the swimmer is quite incorrect in his belief that it enables him to swim longer, and why hyperventilation could be quite dangerous for the swimmer. (8)

OR

QUESTION 51 (Total 20 marks)

(a) Heroin abuse remains a major social health problem in Australia and other Western societies. Describe the effects of heroin on the body and how these can lead to addiction. (5)

(b) Describe the major social effects of heroin addiction. (5)

(c) A new drug called buprenorphine has been put forward as a possible treatment for heroin addiction but has not been fully evaluated.

Design an experiment to evaluate the effectiveness of buprenorphine as a treatment for heroin addiction. You are limited to using 200 people in your experiment, and their participation is limited to 6 months. Include in the description of your experiment:

the hypothesis being tested;
the dependent and independent variables;
the control and experimental groups;
the controlled variables;
how you could reduce experimental error. (10)

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SECTION B

ANSWER EITHER QUESTION 52 OR QUESTION 53—NOT BOTH

QUESTION 52 (Total 20 marks)

A near-complete fossil skeleton was recently discovered in the Olduvai region of East Africa. Initial anatomical analyses suggest that the fossilized skeleton is that of a *Homo habilis*. This identification is further supported by its dating to 1.8 million years BP.

(a) Describe the likely anatomical features of the fossilized skeleton that lead to the conclusion it was *Homo habilis* (and not some other species). (5)

(b) Tools consistent with *Homo habilis* were also found in the vicinity of the fossilised skeleton. Describe the tool culture associated with *Homo habilis*; include in your answer what these tools may have looked liked and how their use reflected the lifestyle assumed for *Homo habilis*. (5)

(c) Discuss how tools subsequently changed with the emergence of *Homo erectus* and *Homo sapiens neanderthalensis*. (10)

OR

QUESTION 53 (Total 20 marks)

Demographic transition occurs when a country moves from being less developed to being developed. Describe and explain the population growth and age structure of a country

(a) before the demographic transition has occurred and (10)

(b) after the demographic transition has occurred. (10)

END OF PAPER

Check that you have written your Student Number on the front cover of this booklet.