SEA SECONDARY EDUCATION AUTHORITY (WA)

TERTIARY ENTRANCE EXAMINATION, 1988

QUESTION/ANSWER BOOKLET

HUMAN BIOLOGY

Please place one of your student identification labels in this box

STUDENT NUMBER—In figures

In words

TIME ALLOWED FOR THIS PAPER

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

MATERIAL REQUIRED/RECOMMENDED FOR THIS PAPER

SEE PAGE 2

INSTRUCTIONS TO CANDIDATES

PART I — Questions 1—40 80 marks
This part consists of multiple choice questions, which should be answered on the separate Multiple Choice Answer Sheet.
USE A "2B" PENCIL.
DO NOT USE A BALL POINT OR INK PEN.

PART II — Questions 41—47 80 marks
This part consists of seven (7) diagram and short answer questions. These should be answered in the spaces provided in the Question/Answer Booklet.
Write your answers in blue or black ball point or ink pen.
Plot the graph in question 45b using a "2B" pencil.

PART III — Questions 48—51 40 marks
This part consists of four (4) essay questions.
Answer ANY TWO (2) questions in Part III.
The essays for Part III should be written on pages 39—46 of the question paper in blue or black ball point or ink pen. Draw any diagrams in pencil.

At the end of the examination carefully check that you have placed your Student Identification Label, and that you have written your student number in figures and words, in the spaces provided on the front cover of this Question/Answer Booklet.

SEE NEXT PAGE

MATERIAL REQUIRED/RECOMMENDED FOR THIS PAPER

TO BE PROVIDED BY THE SUPERVISOR

This Question/Answer Booklet comprising	PART I	Pages 3-17
	PART II	Pages 18-36
	PART III	Pages 37-38
Essay sheets for	PART III	Pages 39-46
Space for rough work		Page 47

Separate Multiple Choice Answer Sheet

TO BE PROVIDED BY THE CANDIDATE

Standard Items
Pens, pencils, eraser, ruler

Special Items
A "2B" pencil for the separate Multiple Choice Answer Sheet

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. Please check carefully and if you have any unauthorised material with you hand it to the supervisor BEFORE reading any further.

SEE NEXT PAGE

PART 1

MARK YOUR ANSWERS TO QUESTIONS 1-40 ON THE SEPARATE MULTIPLE CHOICE ANSWER SHEET, USING A "2B" PENCIL. IF YOU MAKE AN ERROR FOLLOW THE INSTRUCTIONS GIVEN TO YOU ON THE ANSWER SHEET.

IN EACH QUESTION CHOOSE THE BEST ALTERNATIVE.

1. Which ONE of the following sexually transmitted diseases reduces the body's resistance to infection ?

   (a) Syphilis.
   (b) Gonorrhoea.
   (c) Herpes.
   (d) AIDS.

2. In January 1988, the world's population was about

   (a) 4.8 billion (4 800 000 000).
   (b) 6.1 hundred billion (610 000 000 000).
   (c) 2.7 billion (2 700 000 000).
   (d) 3.8 hundred million (380 000 000).

3. Which of the following would NOT have any impact on the rate of accidents in industrialized societies ?

   (a) Alcohol.
   (b) Drugs.
   (c) Advanced medical knowledge.
   (d) Advanced technology.

4. Which of the following statements about environmental pollutants is INCORRECT ?

   (a) Photochemical smog mainly consists of ozone.
   (b) Sulfur dioxide produced from smelting can cause deterioration of old buildings and statues.
   (c) Lead and cadmium accumulate in the body but usually have little effect on health because their levels are so low.
   (d) Contaminated drinking water can increase the spread of infectious hepatitis.

SEE NEXT PAGE

5. Which of the following statements about cancer is **INCORRECT?**

(a) Cancer can be treated by chemotherapy.
(b) At present, lung cancer is the most common malignant cancer in males.
(c) At present, cancer of the cervix is the most common malignant cancer in females.
(d) Bacterial breakdown of food in the intestine can produce carcinogens.

6. The Australian population continues to grow because

(a) on average each Australian has more than one child.
(b) accident rates have declined.
(c) fewer people are dying of cancer.
(d) diseases associated with old age have declined.

7. The percentage of the population suffering from any form of mental illness in Australia more than doubled between the early 1900's and the 1980's. Which of the following statements does **NOT** explain this ?

(a) The population in Australia has increased.
(b) The diagnosis of mental illness has improved.
(c) Stress during normal everyday life has increased.
(d) There has been an increase in lifespan.

8. Which of the following is **NOT** an illness associated with the cardiovascular system ?

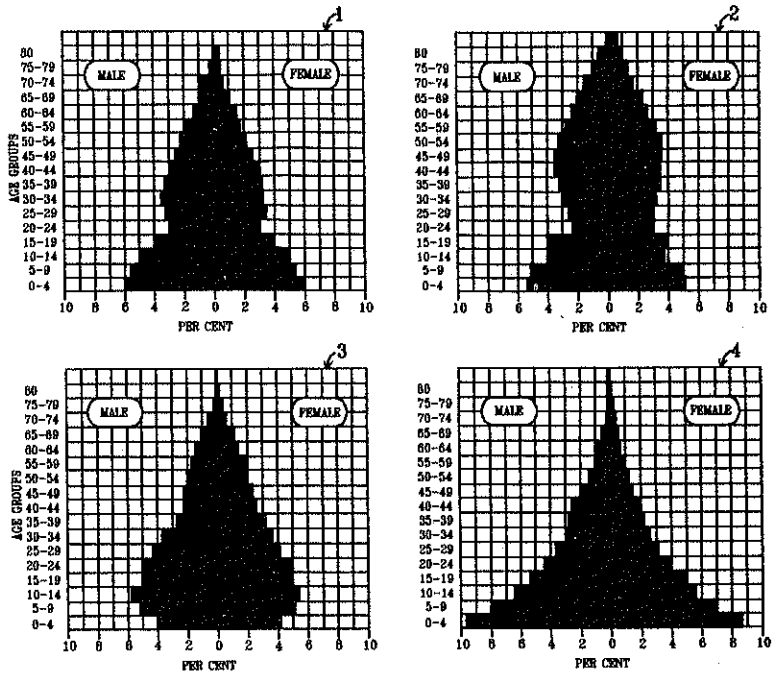
(a) Atherosclerosis.
(b) Melanoma.
(c) Cerebral haemorrhage.
(d) Thrombosis.

9. Mesothelioma is caused by

(a) smoking.
(b) asbestos fibres.
(c) inhaling chemical solvents.
(d) fibreglass.

SEE NEXT PAGE

Questions 10 and 11 refer to the population pyramids below. They show the percentages of the total population in each group.



10. In which population is life expectancy the shortest ?

(a) 1.
(b) 2.
(c) 3.
(d) 4.

11. If the total number of individuals in the age group 20-24 in **POPULATION** 3 is 24 million, then the total number of individuals in **POPULATION** 3 is

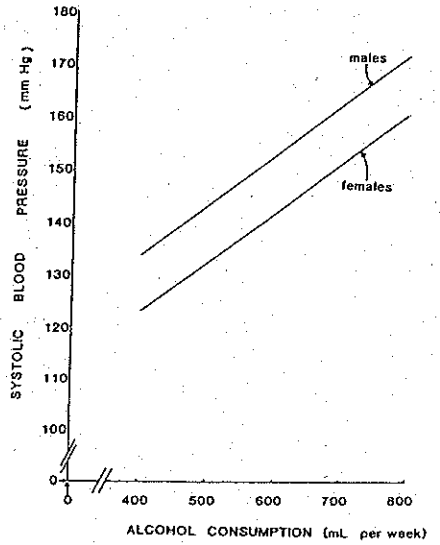
(a) 650 million.
(b) 240 million.
(c) 300 million.
(d) not possible to estimate.

SEE NEXT PAGE

12. Which type of radiation does NOT cause mutations in humans ?

(a) Ultraviolet radiation.
(b) X-rays.
(c) Fallout from testing nuclear weapons.
(d) Microwaves.

Question 13 refers to the line graph below indicating an association between average weekly alcohol consumption and systolic blood pressure in men and women. The alcohol consumption is given in millilitres (mL) of alcohol ingested (a glass of beer is equivalent to about 10 mL of alcohol).

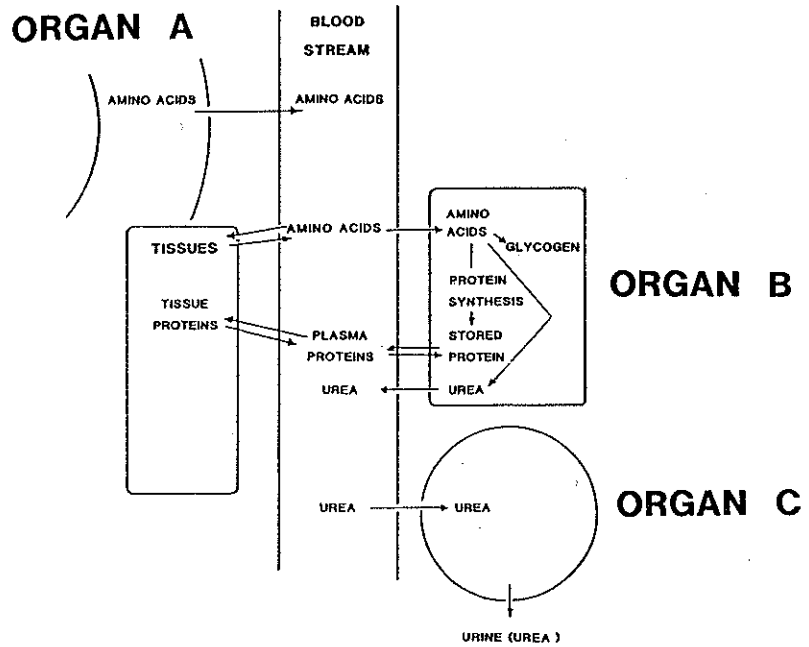


13. Based on the data presented in the line graph above, which of the following statements about alcohol consumption is CORRECT ?

(a) Any increase in blood pressure with increasing alcohol consumption is greatest in men.
(b) Any increase in blood pressure with increasing alcohol consumption is greatest in women.
(c) There is a progressive increase in blood pressure with increasing alcohol consumption.
(d) Men have a lower tolerance to alcohol than women.

SEE NEXT PAGE

Questions and 15 refer to the diagram below showing some of the pathways involved in the metabolism of amino acids within body organs A,B and C.



14. In the diagram

(a) A is the liver, B is the kidney, C is the small intestine.
(b) A is the small intestine, B is the spleen, C is the kidney.
(c) A is the spleen, B is the liver, C is the kidney.
(d) A is the small intestine, B is the liver, C is the kidney.

15. The process occurring in organ B which results in the formation of urea is known as

(a) anabolism.
(b) proteolysis.
(c) reduction.
(d) deamination.

SEE NEXT PAGE

16. Antidiuretic hormone (ADH) is secreted by the posterior lobe of the pituitary gland. The target organ for this hormone is the

(a) large intestine.
(b) liver.
(c) sweat gland.
(d) kidney.

17. Which of the following is an **INCORRECT** description of tissue fluid ?

(a) Fluid contained within the cells.
(b) Fluid between the cells.
(c) Interstitial fluid.
(d) Fluid which accumulates at sites of infection.

18. Rate and depth of breathing increase when a person exercises. This occurs because the concentration of

(a) carbon dioxide in the blood has increased.
(b) oxygen in the blood has decreased.
(c) carbon dioxide in lung bronchi has increased.
(d) oxygen in lung alveoli has decreased.

19. **THREE** of the statements below are true for **BOTH** antibodies and phagocytes. Which statement below is true for **ANTIBODIES ONLY** ?

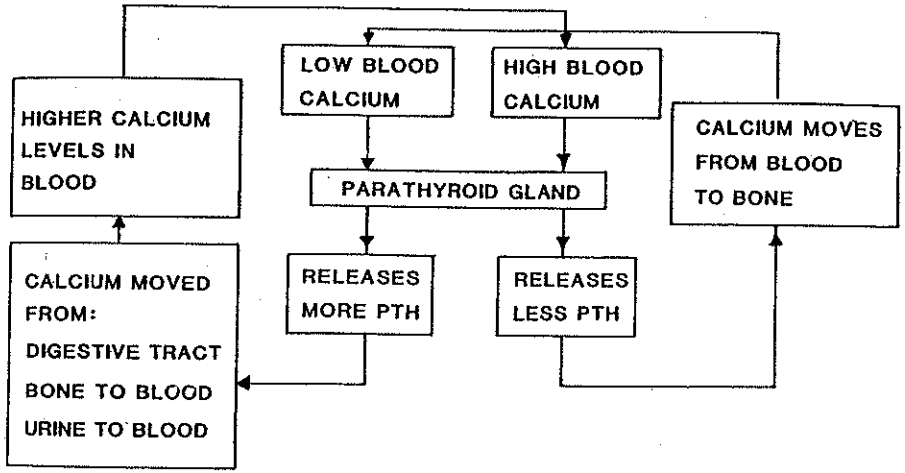
(a) They are involved in neutralizing an antigen.
(b) They are involved in protecting the body against foreign microorganisms.
(c) They are complex compounds but are not living cells.
(d) They pass through the walls of blood vessels to a site where microorganisms have entered the body.

20. A nerve fibre is a

(a) bundle of axons.
(b) bundle of dendrites.
(c) motor nerve.
(d) cytoplasmic extension of a nerve cell body.

SEE NEXT PAGE

Parathyroid hormone (PTH) controls the homeostasis of calcium in the blood. Question 21 refers to the diagram below which summarizes the mechanisms controlling the secretion of PTH by the parathyroid gland.

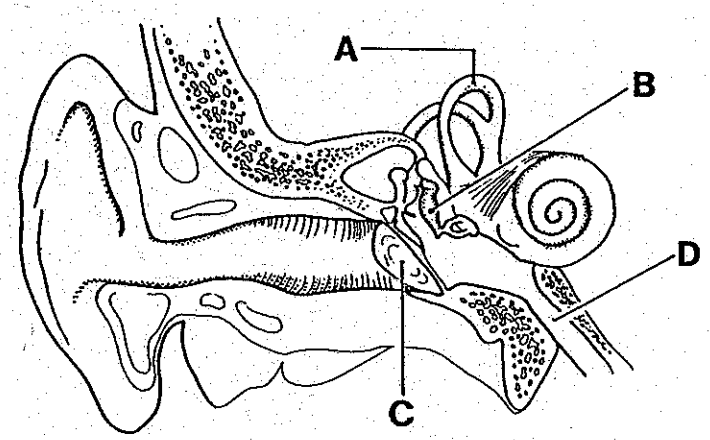


21. If the secretion of PTH from the parathyroid gland increased you would expect

(a) blood calcium to increase.
(b) calcium to be deposited in the bones.
(c) calcium concentration in the urine to increase.
(d) reduced absorption of calcium in the digestive tract.

SEE NEXT PAGE

Question 22 refers to the diagram of the below.



22. If a person suffers from dizziness, and an inability to balance properly, the possible cause of these symptoms could be damage to the part of the ear labelled

(a) A.
(b) B.
(c) C.
(d) D.

SEE NEXT PAGE

23. Which orga. is **NOT** normally considered a part of the immune system ?

(a) Thyroid.
(b) Thymus.
(c) Lymph node.
(d) Bone marrow.

24. The hormone glucagon is secreted by the

(a) liver and causes conversion of glycogen to glucose in the liver.
(b) pancreas and causes conversion of glycogen to glucose in the liver.
(c) liver and causes conversion of glucose to glycogen in the liver.
(d) pancreas and causes conversion of glucose to glycogen in the liver.

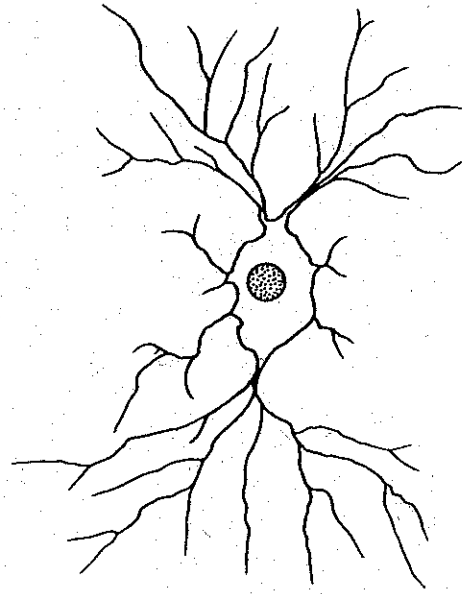
25. There are **THREE** phases in the secretion of gastric juice in the stomach. In the first phase, gastric juice is secreted when food is seen, smelt or tasted. In the second phase, the presence of food in the stomach stimulates the secretion of gastric juice. In the third phase, the presence of partially digested food in the small intestine results in a decrease in the secretion of gastric juice.

If the nerve to the stomach is cut, the first phase ceases but the second and third phases continue. This indicates that secretion of gastric juice is under

(a) nervous control.
(b) hormonal control.
(c) both nervous and hormonal control.
(d) neither nervous nor hormonal control.

SEE NEXT PAGE

Question 26 refers to the diagram below a nerve cell.

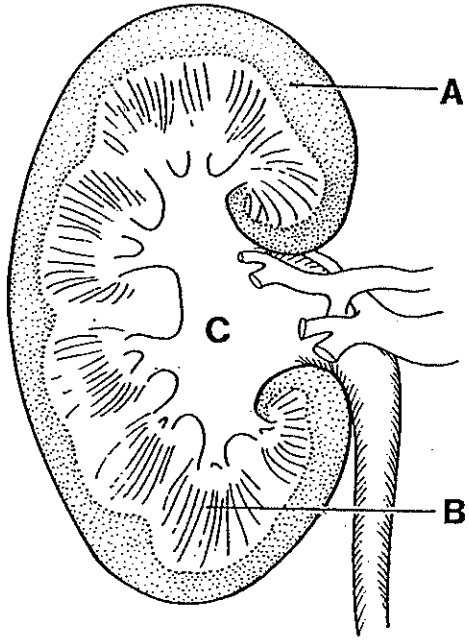


26. The type of nerve cell illustrated in the diagram above is found in

(a) the grey matter of the brain.
(b) the white matter of the spinal cord.
(c) the cochlea of the ear.
(d) touch receptors in the skin.

SEE NEXT PAGE

Question 27 refers to the diagram below of a longitudinal section through the human kidney.



27. On the diagram above

(a) A is the medulla, B is the cortex, C is the renal pelvis.
(b) C is the medulla, B is the cortex, A is the renal pelvis.
(c) B is the medulla, A is the cortex, C is the renal pelvis.
(d) B is the medulla, C is the cortex, A is the renal pelvis.

28. The epoch during which the genus *Homo* appeared was the

(a) Pleistocene.
(b) Miocene.
(c) Paleocene.
(d) Pliocene.

SEE NEXT PAGE

29. A human biologist developed a technique for making rubber casts of the insides of fossilized crania. These casts then enabled brain sizes to be estimated. A comparison of cranial casts of some members of the Hominidae would show that

(a) *Homo sapiens sapiens* brain is larger than *Homo sapiens neanderthalensis* brain.
(b) *Australopithecus afarensis* brain is larger than *Australopithecus africanus* brain.
(c) *Homo erectus* brain is larger than *Homo habilis* brain.
(d) *Australopithecus africanus* brain is larger than *Australopithecus robustus* brain.

30. Which **ONE** of the following includes all the members of the Primate order ?

(a) Prosimians, Old World monkeys and New World monkeys.
(b) Prosimians, Pongidae and Hominidae.
(c) Tree shrews, prosimians and anthropoids.
(d) Lorises, lemurs, Ceboidea and Cercopithecoidea.

31. Old World monkeys and New World monkeys differ in many anatomical and behavioural features. Which of the following statements is **CORRECT**.

(a) Old World monkeys have a well developed prehensile tail; New World monkeys' tails are enormously variable but none are prehensile.
(b) Old World monkeys have thick calloused skin called ischial callosities on which they sit while feeding or sleeping in trees; New World monkeys have no such feature.
(c) Old World monkeys live primarily in forest habitats; New World monkeys live in diverse habitats ranging from savannas and semi-arid deserts to rain forest and high mountains.
(d) Old World monkeys have widely spaced nostrils that open upwards; New World monkeys have nostrils that are close together and open downwards.

SEE NEXT PAGE

32. *Homo sapiens sapiens* is different from the other primates in that they are bipedal, use fire, have complex communication and are skilled tool makers. Which of these unique characteristics was the first to appear during the evolution of the Hominidae ?

(a) Bipedalism.
(b) The use of fire.
(c) Complex vocal communication.
(d) Skilled tool manufacture.

33. In many respects Australian Aborigines were the most successful hunter-gatherers in all human history. To be successful hunter-gatherers the Aborigines

(a) abandoned artistic and religious practices.
(b) did not stay in one place for very long.
(c) lived in large groups of at least one hundred people.
(d) stockpiled food for times of scarcity.

34. Recent discoveries of *Ramapithecus* fossils have led to the conclusion that *Ramapithecus* was not a hominid. Which of the following observations would support the conclusion that *Ramapithecus* was **NOT** a hominid ?

(a) When standing *Ramapithecus'* femurs were close to being parallel.
(b) *Ramapithecus'* sacrum was broad, giving its pelvis a bowl shape.
(c) *Ramapithecus'* toes were short and its heel bone relatively large.
(d) The lower back of *Ramapithecus* was inwardly curved and its lumbar vertebrae relatively large.

SEE NEXT PAGE

35. When Charles Darwin visited the G pagos Islands, 960 km off the west coast of South Amer.ica, he found fourteen different species of finch birds. Although finches are found on the South American continent, none of the Galapagos Islands' species of finches live on the South American mainland. Biologists now believe that the Galapagos Islands were colonized by one ancestral flock of finches that flew from the mainland to the islands shortly after these islands appeared.

Which of the following statements would **NOT** help to explain why there are now fourteen different species of finch on the Galapagos Islands ?

(a) There were a variety of different habitats on the Galapagos Islands which the colonizing finches could exploit.
(b) There was genetic variation in the original population that colonized the Galapagos Islands.
(c) Different finches were naturally selected in different ways to produce different species.
(d) The Galapagos Island finches have been able to interbreed freely amongst themselves.

36. The agricultural revolution accelerated human cultural evolution because it

(a) was a more efficient way of food production than hunter-gathering.
(b) increased the mobility of people.
(c) caused an increase in the world population.
(d) occurred independently in three different places around the world.

37. Several human features have been identified as responses to local climatic conditions. Which **ONE** of the following evolved as a climatic adaptation ?

(a) Decreased body size in cooler climates.
(b) Longer lower limbs in hotter climates.
(c) Reduced body surface area in relation to body volume in hotter climates.
(d) Larger sinuses and less fat padding on the faces of the Asiatic race from colder climates.

SEE NEXT PAGE

38. The im t of white settlement on the health of Australian Aborigines has been devastating because

(a) the Aborigines adopted the dietary habits of the new settlers.
(b) the new settlers brought many diseases for which the Aborigines had no acquired immunity.
(c) agricultural practices of the new settlers reduced the resources available for the Aborigines.
(d) all of the above (a,b and c).

39. At Laetoli in Tanzania thousands of animal tracks have been found in volcanic ash deposits. These deposits have been dated at 3.5 million years old. Some tracks had been left by members of the Hominidae. These Hominid tracks would have been made by

(a) *Australopithecus africanus.*
(b) *Homo habilis.*
(c) *Australopithecus robustus.*
(d) *Australopithecus afarensis.*

40. A mound of shellfish remains was discovered in a Tasmanian cave. These remains have been tentatively dated at 80 000 years old. If this date is accurate, these shellfish remains would

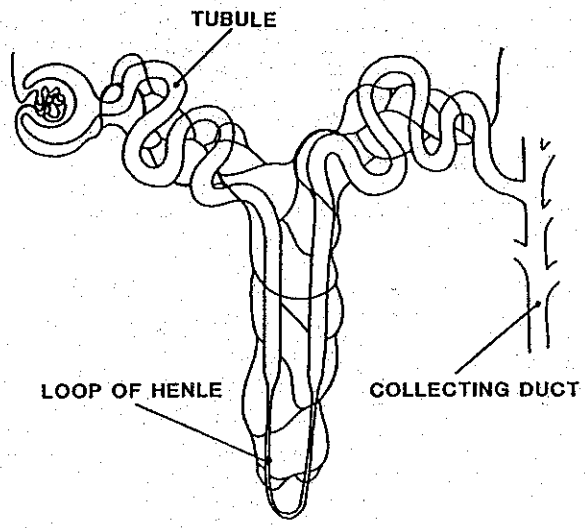
(a) place in doubt the ages assigned to *Homo* fossils found at Lake Mungo.
(b) mean that *Homo* must have entered the Australian land mass before 80 000 years ago.
(c) confirm the presence of *Homo erectus* in Australia.
(d) mean that *Homo* must have entered the Australian land mass from the South and not the North.

SEE NEXT PAGE

PART II ANSWER ALL QUESTIONS

QUESTION 41.

Question 41 refers to the diagram below of the structure of a nephron.



(a) Explain why there is normally very little protein in the liquid in the collecting duct.

(2 marks)

SEE NEXT PAGE

41. (continued)

(b) Explain why there is normally no glucose in the liquid in the collecting duct.

(2 marks)

(c) The kidney has a relatively high energy requirement. What energy demanding functions are performed by the kidney ?

(2 marks)

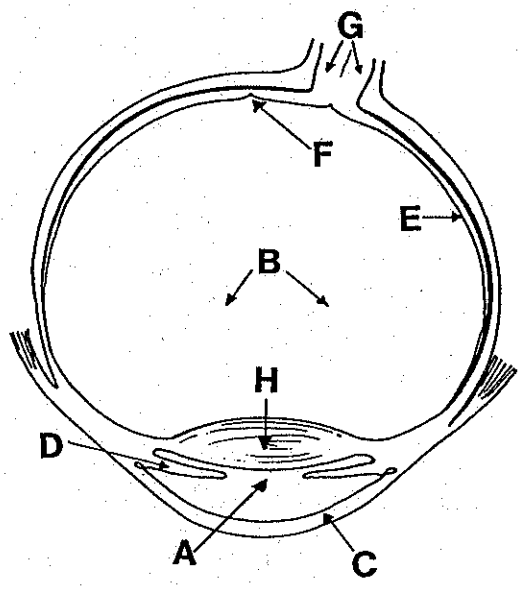
(d) Why is the kidney tubule so long ?

(2 marks)

SEE NEXT PAGE

QUESTION 42.

Question 42 refers to the diagram below illustrating a horizontal section through the right eye of a human.



(a) Name the structures of the eye indicated A - F on the diagram.

A_____

B_____

C_____

D_____

E_____

F_____

(6 marks)

SEE NEXT PAGE

42. (continued)

(b) Explain the function of the structures labelled:

E_____

G_____

(2 marks)

(c) Explain how the structure labelled D would change when a person switched on a bright light in a dark room. Why does this change occur ?

_____

_____

_____

_____

(2 marks)

(d) As a person gets older the structure labelled H loses some of its elasticity. Explain the consequence of this loss of elasticity.

_____

_____

_____

_____

(2 marks)

SEE NEXT PAGE

QUESTION 43.

LIST A below gives the names of a number of different parts of the brain and its associated tissues. LIST B below mentions some of the possible functions of these parts.

LIST A	LIST B
1. Hypothalamus	a. Protection of the brain.
2. Cerebrum	b. Automatic adjustment of such body functions as heart beat and breathing.
3. Meninges	c. Provision of nutritive substances from the blood.
4. Cerebellum	d. Reception of nearly all impulses from sense organs.
5. Medulla	e. Control of posture and balance.
6. Pons	f. Control of most endocrine glands.
	g. Control and integration of the autonomic nervous system.
	h. Relay of impulses between the spinal cord and the parts of the brain.

(a) Match each part in List A with the most appropriate function stated in List B by writing in the appropriate letter **a - h** in the brackets provided below.

1. Hypothalamus matches ( )
2. Cerebrum matches ( )
3. Meninges matches ( )
4. Cerebellum matches ( )
5. Medulla matches ( )
6. Pons matches ( )

(6 marks)

SEE NEXT PAGE

43. (continued)

(b) List **TWO** functions of the somatic nervous system.

_____

_____

_____

_____

(2 marks)

(c) List **TWO** functions of the autonomic nervous system.

_____

_____

_____

_____

(2 marks)

SEE NEXT PAGE

QUESTION 44.

(a) Define the term "disease".

(2 marks)

(b) Why is it more difficult to treat a viral infection than it is to treat a bacterial infection ?

(2 marks)

(c) Name **TWO** vectors that may transmit disease from person to person. Describe the way in which **EACH** of these vectors transmits its disease.

(4 marks)

SEE NEXT PAGE

44. (continued)

(d) For **ONE** of the vectors named in (c) describe **TWO** methods by which it may be controlled.

(2 marks)

(e) Explain how immunisation is a means of defence against some diseases.

(3 marks)

(f) Explain how a cancerous growth begins.

(2 marks)

SEE NEXT PAGE

44. (continued)

(g) Describe the difference between a malignant and benign cancerous growth.

_____

_____

_____

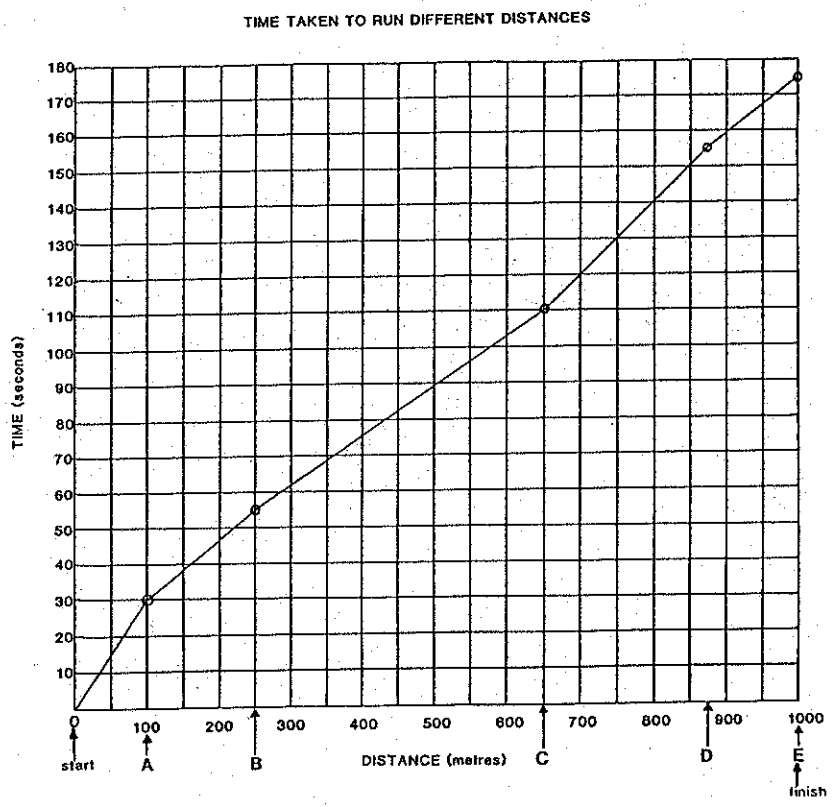
_____

(2 marks)

THIS PAGE HAS BEEN LEFT BLANK INTENTIONALLY.

QUESTION 45.

An athlete completed a 1000 metre time trial. During this trial timekeepers stood at various distances along the 1000 metre course and at the finish line. The time it took this athlete to reach each timekeeper was recorded and is displayed in the line graph below. The bold letters **A,B,C** and **D** indicate the distance from the start line each timekeeper is positioned. Timekeeper **E** was at the finish line.



SEE NEXT PAGE

45. (continued)

(a) Between which **TWO** timekeeper positions, **A to B, B to C, C to D** or **D to E** was this athlete running the fastest ? Clearly explain how you arrived at your answer.

_____

_____

_____

_____

(2 marks)

A second athlete completed the same distance in a second time trial. In this time trial the timekeepers were at different positions than for the first athlete. The **DISTANCE** from the start to where each timekeeper was positioned and the **TIME** taken to reach each timekeeper is given in the table below.

TIMEKEEPER	DISTANCE FROM START (metres)	TIME (seconds)
A	150	30
B	450	70
C	720	135
D	960	165
E	1000	175

(b) Plot the above data on the graph **ON PAGE 28.**

(2 marks)

SEE NEXT PAGE

45. (continued)

(c) Based on the two curves on the graph, which athlete (**FIRST** or **SECOND**) was the fastest over the first 500 metres. Explain how you arrived at your answer.

(2 marks)

The athlete completing the first time trial also had a monitor attached to the chest to provide a record of heart rate every 100 metres. The data for the first 700 metres of the time trial is presented in the table below.

DISTANCE COMPLETED (metres)	HEART RATE (beats per minute)
100	145
200	175
300	180
400	189
500	198
600	210
700	230

(d) Would it be **MORE** or **LESS** accurate to predict a heart rate for this athlete at 430 metres than to predict heart rate at 900 metres ? Explain your reasoning.

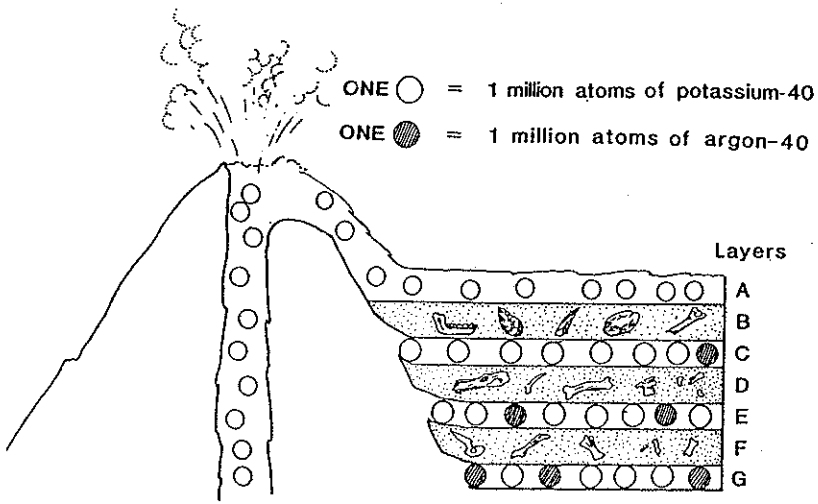
(2 marks)

SEE NEXT PAGE

QUESTION .

One of the breakdown products of potassium-40 is argon-40. Argon-40 is a gas which is not normally found in rocks unless it is trapped in solid lava by the decay of potassium-40. By measuring the ratio of potassium-40 to argon-40 in solid lava it is possible to determine the age of that lava since the rate at which potassium-40 breaks down into argon-40 is known. This method of absolute dating is known as radioisotope dating.

The figure below shows a volcano which is erupting and has erupted periodically for millions of years. Layers **A,C,E** and **G** are lava.



(a) Explain why layer **A** has no argon in it.

(2 marks)

SEE NEXT PAGE

46. (continued)

(b) What is the ratio of potassium-40 to argon-40 in the layer labelled E ?

(1 mark)

(c) Layers B,D and F contain the same type of rock. Name this type of rock and explain how it has come to be lying between layers of lava.

(3 marks)

(d) Why are fossils **NOT** found in layers **A,C,E** and **G** ?

(1 mark)

SEE NEXT PAGE

46. (con .nued)

(e) The conditions in layers B,D and F must have been suitable for fossilization. Give **TWO** conditions that assist fossilization and explain how they improve the chance of fossilization.

(4 marks)

(f) Anthropologists believe that layer F was laid down 40 to 70 million years ago. Give **TWO** different methods, other than the potassium-argon dating method, by which the age of layer F could be determined. Explain how each method works.

(4 marks)

SEE NEXT PAGE

46. (continued)

(g) Layer B contains evidence that a new genus has evolved. What is this evidence and what is the name of the new genus?

_____

_____

_____

_____

(2 marks)

SEE NEXT PAGE

QUESTION 47.

The table below shows the sequence of six amino acids in the protein haemoglobin, as it occurs in humans and in each of four other primates (A,B,C and D).

PRIMATE	AMINO ACID SEQUENCES IN HAEMOGLOBIN
Human	proline-serine-alanine-valine-glycine-lysine
A	lysine-alanine-threonine-valine-leucine-lysine
B	proline-serine-alanine-valine-leucine-lysine
C	lysine-alanine-alanine-valine-leucine-lysine
D	lysine-serine-alanine-valine-leucine-lysine

(a) Based on the above evidence list the primates **A,B,C** and **D** from the primate which is **MOST CLOSELY RELATED** to humans (1) to the primate which is **MOST DISTANTLY RELATED** to humans (4).

MOST CLOSELY RELATED TO HUMANS 1._____

2._____

3._____

MOST DISTANTLY RELATED TO HUMANS 4._____

(2 marks)

SEE NEXT PAGE

47. (continued)

(b) Select **TWO** racial characteristics that provide evidence for natural selection in human populations. Identify the geographic race (or races) which exhibit these characteristics and explain why **EACH** characteristic has evolved.

(6 marks)

1988

SEE NEXT PAGE

PART III

ANSWER **ANY TWO** QUESTIONS FROM THIS SECTION.

ILLUSTRATE YOUR ANSWER WITH DIAGRAMS, WHERE APPROPRIATE. UP TO TWO MARKS MAY BE DEDUCTED FOR POORLY STRUCTURED ESSAYS ie. ANSWERS IN POINT FORM OR DIAGRAMS NOT EXPLAINED IN THE TEXT OF THE ESSAY.

DO **NOT** WRITE YOUR ANSWER IN **PENCIL**.

QUESTION 48

Homeostasis may be defined as the maintenance of a constant internal environment so that the cells of the body are able to function at maximum efficiency.

(a) Describe **FOUR** factors of the internal environment which are kept constant by homeostatic mechanisms. Explain why it is important to the cell that each of these factors remains constant.

(8 marks)

(b) Select any **ONE** of the factors you described above and explain the control system by which homeostasis is achieved. In your answer refer to receptors, stimuli, modulators, effectors, responses and feedback.

(12 marks)

QUESTION 49.

(a) Identify and explain the factors affecting growth rate and age structure of a population. Explain how these factors interact to establish present trends in the Australian population.

(8 marks)

(b) In the Australian population today there is an increasing incidence of drug abuse. Explain **TWO** reasons for drug abuse in our society **AND** explain how drug dependence may develop from such abuse.

(4 marks)

(c) For **EACH** of the following drugs:

(i) alcohol.
(ii) tobacco.
(iii) analgesics.
(iv) marijuana.

Explain **TWO** biological effects on individuals who have developed dependence.

(8 marks)

SEE NEXT PAGE

QUESTION 50.

(a) Identify FIVE evolutionary trends in the Primate order and explain why natural selection has favoured each of these trends.

(10 marks)

(b) Identify FIVE features that anthropologists would use to classify a complete fossil skeleton as a hominid. Explain the advantages of each of these features to the hominid.

(10 marks)

QUESTION 51.

(a) Describe the role of the following structures in protecting the human body from infection against microorganisms:

(i) skin.
(ii) lymph vessels and lymph nodes.
(iii) lymphocytes.

(6 marks)

(b) One of the greatest causes of deaths in Australia is cardiovascular disease. Give an account of how FOUR risk factors, known to contribute to cardiovascular disease, can be controlled.

(8 marks)

(c) Individuals with blood group O are more susceptible to bubonic plague than individuals with blood groups A or B. Explain how natural selection could change A,B and O gene frequencies in a population during an outbreak of this disease.

(6 marks)

END OF PAPER

1988

SEE NEXT PAGE

SEE NEXT PAGE