SEA SECONDARY EDUCATION AUTHORITY (WA)

TERTIARY ENTRANCE EXAMINATION, 1987 — 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

TO BE PROVIDED BY THE SUPERVISOR

This Question/Answer Booklet comprising

	PART I	Pages 3—17
	PART II	Pages 18—35
	PART III	Pages 36—37
Essay sheets for	PART III	Pages 38—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.

NOTE: INSTRUCTIONS CONTINUED ON 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 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.
Draw any diagrams using a "2B" pencil.

PART III Questions 48—51 40 marks
This part consists of 4 essay questions.
Answer ANY TWO questions in Part III.
The essays for Part III should be written on pages 38—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 Candidate Identification Label, and that you have written your candidate number in figures and words, in the spaces provided on the front cover of this Question/Answer Booklet.

SEE PAGE 3

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. Natural selection is occurring in a population. Which of the following statements is CORRECT ?

   (a) The population must be completely isolated from other groups of the same species.
   (b) There must be variation amongst the individuals making up the population.
   (c) Interbreeding must occur with related groups.
   (d) Mutations must occur frequently within the population.

2. Which of the following statements about antidiuretic hormone (ADH) is INCORRECT ?

   (a) ADH causes the kidneys to remove water from glomerular filtrate and return it to the bloodstream thus decreasing urine volume.
   (b) The pituitary releases ADH in response to a low water concentration in the plasma.
   (c) Alcohol inhibits ADH secretion and therefore increases urine output.
   (d) ADH concentration in blood remains constant to maintain homeostasis.

3. The estimated life expectancy of Cro-Magnon Man was about 32 years. In the fourteenth century people living in England had a life expectancy of about 38 years. In Australia today life expectancy is in excess of 70 years. The lengthening of human life span is mainly a result of

   (a) natural selection.
   (b) increase in brain size.
   (c) changing culture.
   (d) improved climatic factors.

4. The term race is used to describe a population of Homo sapiens. Which of the following statements about a race is CORRECT ?

   (a) The gene pool of a race is completely different from those of other races.
   (b) A race is a pure breeding population, within which gene frequencies remain constant.
   (c) A race is a continuing population, with a distinct gene pool, but capable of gene exchange with other races.
   (d) The gene frequencies within a race change only through natural selection.

SEE PAGE 4

The information below refers to Question 5. This information shows some normal physiological changes in the human body.

A dilation of pupils
B increase in heart rate
C increased secretion of saliva
D increased secretion from sweat glands
E dilation of blood vessels in skeletal muscle
F decreased levels of adrenalin in blood

5. Which of the changes in the above list would result from stimulation by the sympathetic division of the autonomic nervous system ?

(a) A,B,C and E
(b) A,C,D and F
(c) A,B,D and E
(d) B,C,E and F

The following list of characteristics possessed by humans should be used in answering Questions 6 and 7.

I presence of hair on the body
II nails on digits
III forward facing eyes
IV friction ridges on the fingers
V development of young within the uterus

6. Which of the characteristics distinguish humans as mammals ?

(a) I and II
(b) I and V
(c) II and V
(d) III and IV

7. Which of the characteristics distinguish humans as Primates ?

(a) I and IV
(b) II and V
(c) II and III
(d) III and V

8. Which of the following statements is CORRECT ?

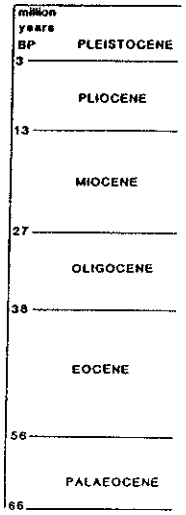
(a) Cells use all of their nutrients to release energy.
(b) Most body cells tolerate a wide degree of variation in the concentration of their surrounding interstitial fluid.
(c) The kidney converts toxic ammonia molecules to the less toxic urea molecules by a process called deamination.
(d) Enzyme functioning depends upon the pH of body fluids.

SEE PAGE 5

9. The regulation of breathing and heart rate involves neurons whose cell bodies lie in the

(a) cerebrum.
(b) spinal cord.
(c) medulla.
(d) pons.

Questions 10 and 11 refer to the diagram below of the geological time scale.



10. The first australopithecines appeared during the

(a) Eocene.
(b) Oligocene.
(c) Miocene.
(d) Pliocene.

11. The first members of the genus Ramapithecus are thought to have appeared during the

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

SEE PAGE 6

12. A short time after a normal meal blood glucose level increases. This rise in sugar level results in SUBSTANCE A being secreted into the bloodstream. Substance A acts on target cells in ORGAN X to convert excess glucose to SUBSTANCE B. As glucose absorption from the intestine slows down some two hours after eating, blood sugar level falls. Should this level of sugar fall below a minimum level, cells in ORGAN Y secrete SUBSTANCE C which stimulates the breakdown of substance B to glucose.

(a) SUBSTANCE A is ammonia
ORGAN X is the liver
SUBSTANCE B is urea
ORGAN Y is the hypothalamus
SUBSTANCE C is insulin

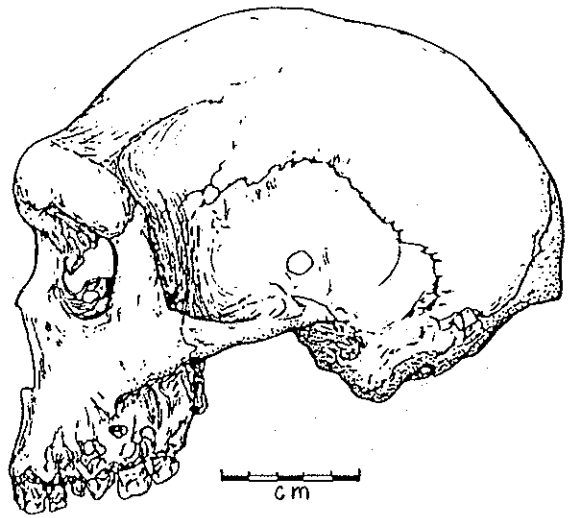
(b) SUBSTANCE A is insulin
ORGAN X is the liver
SUBSTANCE B is glycogen
ORGAN Y is the pancreas
SUBSTANCE C is glucagon

(c) SUBSTANCE A is insulin
ORGAN X is the pancreas
SUBSTANCE B is glucagon
ORGAN Y is the liver
SUBSTANCE C is adrenalin

(d) SUBSTANCE A is adrenalin
ORGAN X is the adrenal gland
SUBSTANCE B is glycogen
ORGAN Y is the pancreas
SUBSTANCE C is glucagon

SEE PAGE 7

Question 13 refers to the diagram below.



13. The fossil skull illustrated is likely to have been classified as

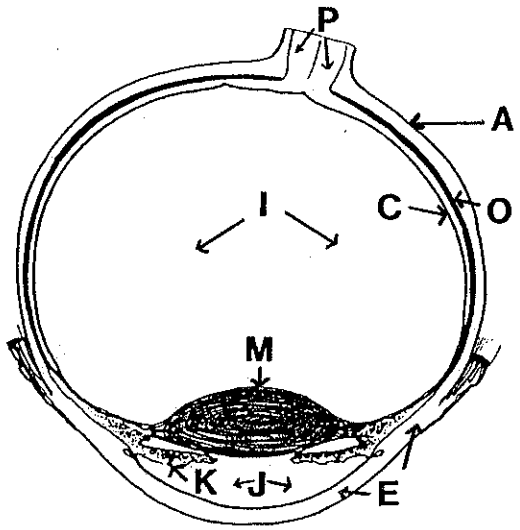
(a) Homo erectus.
(b) Homo habilis.
(c) Australopithecus afarensis.
(d) Australopithecus africanus.

14. Loss of excess heat from the body involves

(a) vasodilation of blood vessels in the skin under control of the sympathetic nervous system.
(b) sweating under the control of the sympathetic nervous system.
(c) the pituitary as the controlling centre.
(d) piloerection to increase surface area.

SEE PAGE 8

Questions 15 - 17 refer to the diagram below illustrating a horizontal section through the right eye of a human.



15. Which of the following statements is CORRECT ?

(a) Light rays stimulate the production of nerve impulses at C.
(b) Vitreous humor is contained in J.
(c) Structure K is involved in accomodation.
(d) Structure E is the choroid.

16. Which of the following statements is CORRECT ?

(a) Structure O contains aqueous humor.
(b) Structure A is the retina.
(c) The amount of light entering the eye is regulated by muscles within the structure K.
(d) Structure P is the blind spot.

17. Cataract formation is characterized by

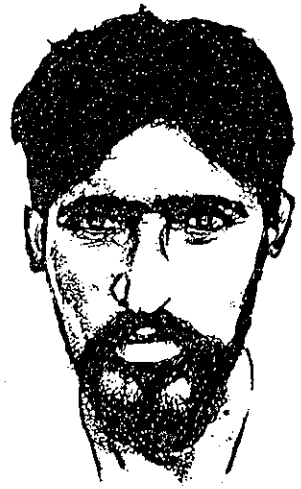
(a) increased fluid pressure within structure I.
(b) increased fluid pressure within structure M.
(c) loss of transparency of structure M.
(d) loss of transparency of structure I.

SEE PAGE 9

18. The four passages below are descriptions of characteristics of populations of humans. Which one of the following statements offers LEAST support for the hypothesis that humans are adapted to the environment in which they live ?

(a) Indians living high in the Andes of Peru have a bigger chest and lung capacity than coastal dwellers.
(b) Gradations in nose form occur in Australian Aborigines in which the narrowest noses are found in populations living in the coldest, driest climates.
(c) The Nilotes of East Africa have linear bodies and exceptionally elongated limbs.
(d) Dwarfism frequently appears among the Old Order Amish of the USA but it is exceedingly rare among Germans living in the area from which the Amish originally migrated.

The diagram below refers to Question 19.

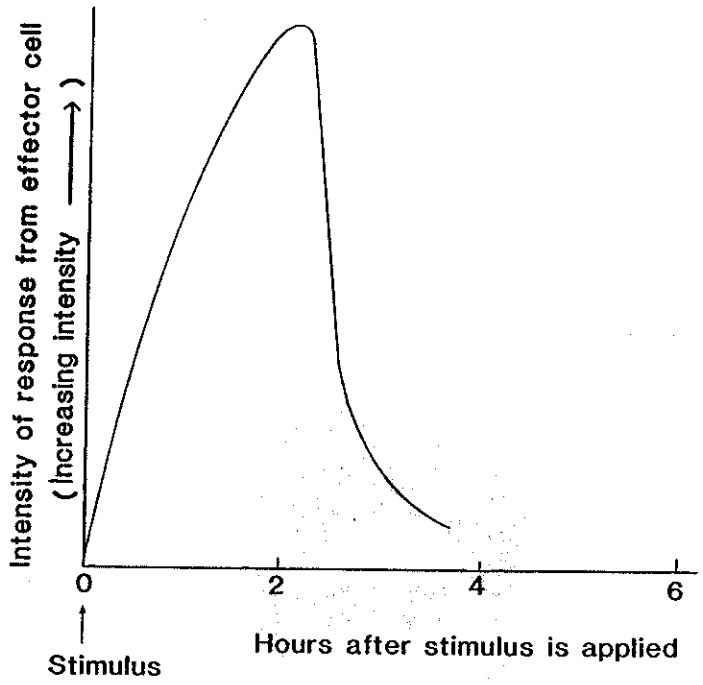


19. The individual illustrated in the diagram above belongs to which ONE of the following geographical races ?

(a) Asiatic
(b) Polynesian
(c) Mediterranean
(d) European

SEE PAGE 10

Question 20 refers to the diagram below.

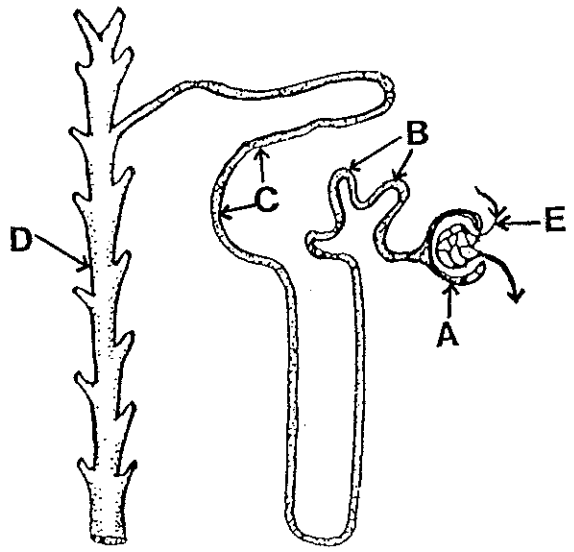


20. From the diagram above, one could reasonably conclude that, following application of the stimulus

(a) the response from the effector cell is controlled by nerves.
(b) the response from the effector cell is controlled by hormones.
(c) the effector cell is secreting antibody in response to an antigenic stimulus.
(d) the effector cell is a cardiac muscle cell increasing oxygen consumption in response to 30 minutes of physical exercise.

SEE PAGE 11

Questions 21 and 22 refer to the following diagram of a nephron.



21. Which one of the following statements is CORRECT ?

(a) Filtration of blood occurs at A allowing all plasma components except the blood cells to enter the Bowman capsule.
(b) Reabsorption of chloride ions and glucose occurs at B and C.
(c) Insulin affects the functioning of structures C and D.
(d) Water is reabsorbed passively by osmosis at B.

22. Structure E is the

(a) afferent arteriole.
(b) collecting duct.
(c) urethra.
(d) glomerulus.

SEE PAGE 12

23. Which of the following statements about absolute dating of fossils or artefacts is CORRECT ?

(a) Absolute dating is always based on the rate of decay of a radioactive isotope.
(b) Absolute dating gives the most accurate estimate of the age of the material being dated.
(c) Carbon must be present in material if it is to be dated by absolute methods.
(d) Absolute dating can only be used to determine the age of the rock in which a fossil or artefact is found.

Questions 24 and 25 refer to the following account of the body's reaction to a toxin invading the skin.

A toxic substance, partly consisting of a foreign protein, penetrated the epidermis of the skin. It was immediately detected by a particular cell type resident under the skin surface which responded by multiplying and producing another cell type. This new cell manufactured and secreted a substance which neutralized the toxin. Other cells entered the area and ingested the neutralized toxin.

24. The toxic substance was immediately detected by

(a) lymphocytes.
(b) T cells.
(c) plasma cells.
(d) phagocytes.

25. The neutralized toxin was ingested by

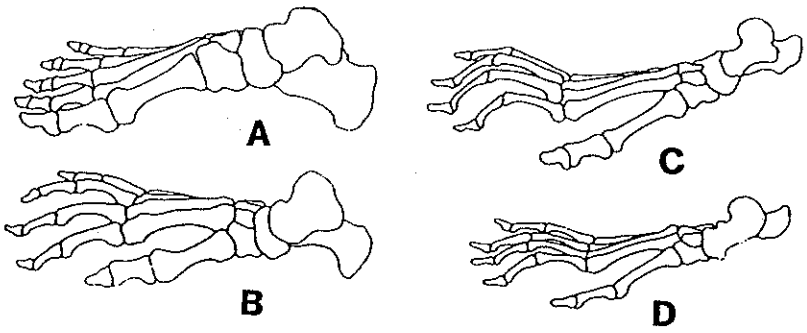
(a) lymphocytes.
(b) T cells.
(c) plasma cells.
(d) phagocytes.

26. Which of the following is NOT an adaptation to upright stance or bipedal locomotion ?

(a) The foramen magnum is located towards the back of the skull.
(b) The heel bone is enlarged.
(c) Vertebrae in the lower part of the spine are wedge-shaped.
(d) The pelvis is broad and short.

SEE PAGE 13

Question 27 refers to the diagrams below of bones from the foot of four primates.



27. Which ONE is human ?

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

28. Smoke from a typical filtered cigarette contains several hundred different chemicals. Nicotine is perhaps the best known of these chemicals and it is known to cause

(a) anaemia.
(b) cancer.
(c) cardiovascular disease.
(d) breathlessness.

29. Which of the following statements about alcohol is CORRECT ?

(a) Blood alcohol concentration depends solely upon the rate at which alcohol is consumed.
(b) Once it is absorbed, alcohol is evenly distributed to all body tissues.
(c) At a blood alcohol concentration of 0.05 percent the psychoactive effects of alcohol would not be measurable.
(d) Alcohol depresses the functioning of the central nervous system.

SEE PAGE 14

30. Receptors for sound are located in the

(a) auricle.
(b) cochlea.
(c) medulla.
(d) stapes.

31. Atherosclerosis is a slow progressive disease that begins early in life and is related to an elevated intake of dietary cholesterol. Atherosclerosis can be a fatal disease because it sometimes results in

(a) chronic liver disease.
(b) cancer of the colon.
(c) coronary thrombosis.
(d) hardening of the arteries.

32. In 1970 the average level of DDT in cows' milk was found to be 5 parts per million while human mothers' milk in that year had an average DDT content of 20 parts per million. The reason for this difference was that

(a) cattle are herbivores, humans are omnivores.
(b) cattle break down DDT better than humans.
(c) cattle have a greater mass than humans.
(d) DDT is more efficiently absorbed by the human alimentary tract.

33. Which of the following statements is CORRECT about AIDS (Acquired Immune Deficiency Syndrome) ?

(a) The AIDS virus is a dangerous virus because it can live outside the human body for long periods of time.
(b) The AIDS virus first invaded human populations in Africa.
(c) Only a small percentage of people who are antibody positive for the AIDS virus will develop full-blown AIDS.
(d) Homosexuals and intravenous drug users are the only groups of people who fall into the "high risk" category.

34. Which of the following statements about cancer is INCORRECT ?

(a) Viruses can cause cancer.
(b) Our immune system protects us against cancer.
(c) The incidence of cancer in developed countries is decreasing.
(d) Leukemia is a cancer of tissues that form blood cells.

SEE PAGE 15

35. In a large study to investigate a possible association between blood groups and the incidence of duodenal ulcers, doctors in different parts of the world obtained the following data showing the percentage of a group of healthy individuals and of individuals suffering with duodenal ulcers, having blood groups O or A:

COUNTRY	HEALTHY POPULATION		DUODENAL ULCER PATIENTS	
	BLOOD GROUP		BLOOD GROUP	
	O	A	O	A
United Kingdom	45.8%	44.2%	56.6%	32.9%
America	45.8%	41.6%	53.7%	36.3%
Italy	36.3%	44.2%	41.0%	41.3%
Australia	53.9%	32.3%	57.7%	31.5%

From the above data it appears that those with the greatest risk of developing a duodenal ulcer are people with blood group

(a) O in the United Kingdom.
(b) A in America.
(c) A in Italy.
(d) O in Australia.

36. During fossil digs four hearths were uncovered in four separate deposits. The table below shows information about where each was found and its characteristics.

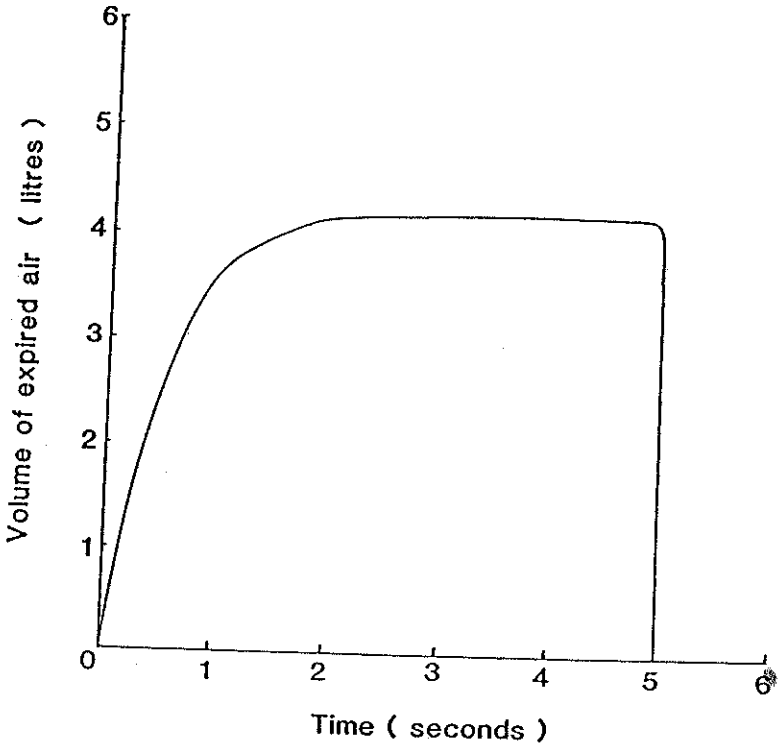
HEARTH	DEPTH AT WHICH FOUND	CARBON 14 CONTENT	ASSOCIATED ARTEFACT
A	1.6m	0.1 units	bone point
B	1.9m	0.4 units	carved horn
C	2.0m	0.2 units	stone flake
D	3.1m	0.3 units	stone hand axe

Which hearth was most likely to be the oldest ?

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

SEE PAGE 16

Question 37 refers to the trace below obtained when a subject forcefully exhaled into a vitalograph.

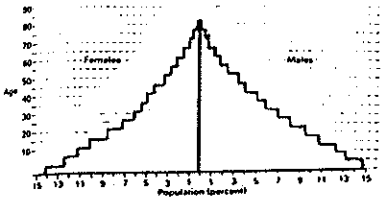


37. A vitalograph is a machine that measures the Forced Vital Capacity (FVC) of an individual. This is the maximum volume of air expired (in litres) after the deepest possible breath. The vitalograph also measures the Forced Expiratory Volume in one second ($FEV_{1.0}$) and this is the volume of air expired in the first second of blowing. The ratio of $FEV_{1.0}$ to FVC for the subject shown in the trace above is

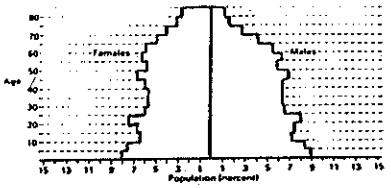
(a) 0.88
(b) 1.36
(c) 1.40
(d) 0.63

SEE PAGE 17

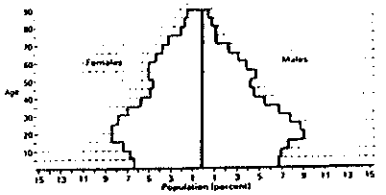
Questions 38 and 39 refer to the population pyramids below.



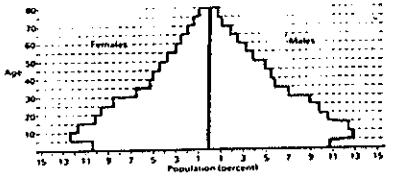
1



3



2



4

38. Which of these populations is most stable ?

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

39. In which population has demographic transition just commenced ?

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

40. Which one of the following is <u>NOT</u> a component of a neuron ?

(a) Axon
(b) Cell nucleus
(c) Dendrite
(d) Ganglion

SEE PAGE 18

PART II ANSWER ALL QUESTIONS

QUESTION 41.

A human biologist was testing the following hypothesis:

"Decreased temperature is the stimulus that causes an increase in thyroxine concentration in the blood."

To investigate this hypothesis the human biologist kept 10 adults in room 1 at 22°C for 12 hours. Subjects were then transferred to room 2 where they were kept at 10°C for a further 12 hours. The group contained 5 males and 5 females, all of the same age. They were fed an identical diet in rooms 1 and 2. Thyroxine levels in the subjects' blood were determined after their stay in room 1 and again after their stay in room 2.

The procedures and variables involved in this experiment are listed below:

LIST A	LIST B
1. Treatment procedure/s	(a) thyroxine concentration
2. Control procedure/s	(b) sex
3. Dependent variable/s	(c) room 1
4. Independent variable/s	(d) temperature
5. Controlled variable/s	(e) room 2
	(f) time
	(g) diet
	(h) age

(a) Match ALL the terms in LIST A (1 to 5) with the appropriate factor/s in LIST B by writing in the appropriate letters (a to h).

1 matches (_____)

2 matches (_____)

3 matches (_____)

4 matches (_____)

5 matches (_____)

5 marks

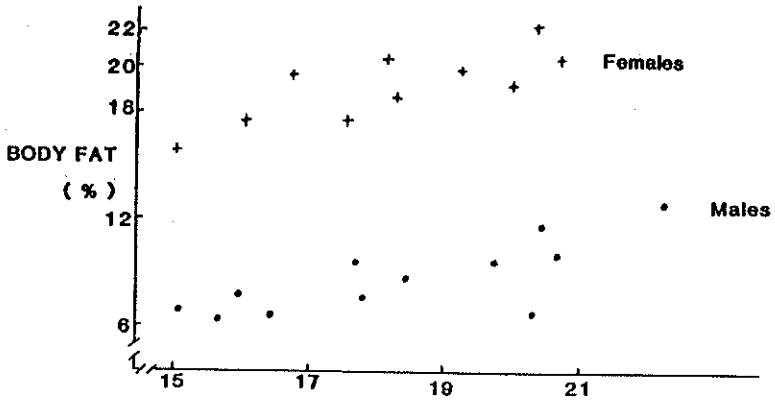
SEE PAGE 19

41. (continued)

(b) Body Mass Index relates the mass (kg) and the height (m) of an individual according to the following formula:

$$\text{Body Mass Index} = \frac{\text{Mass (kg)}}{(\text{Height (m)})^2}$$

Body Mass Index and percentage body fat were determined for a group of students and these values were plotted against each other as shown in the diagram below.



(i) Describe the relationship between Body Mass Index and percentage body fat.

_____

_____

_____

1 mark

(ii) Why was the percentage of body fat not plotted directly against mass (kg) ?

_____

_____

_____

_____

1 mark

SEE PAGE 20

41. (continued)

(iii) What is the average percentage body fat for males and females in the Body Mass Index range 19 to 21 ? Show all your working.

2 marks

(c)

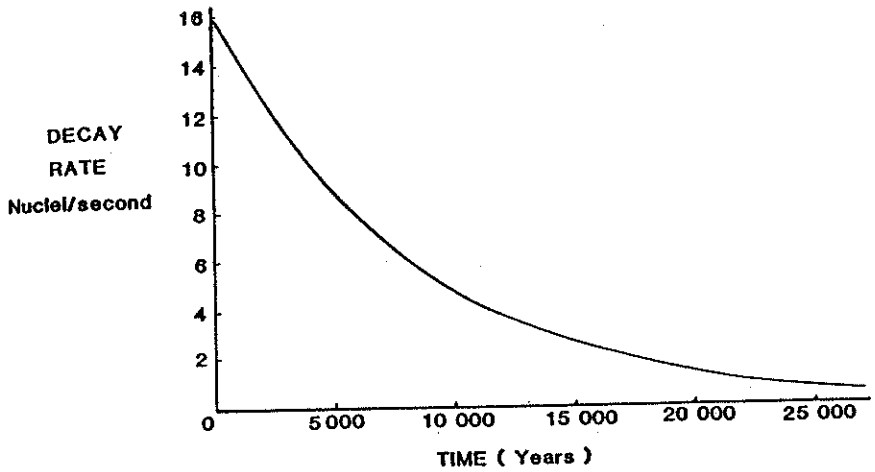
(i) Define the term half-life.

2 marks

SEE PAGE 21

41. (continued)

The graph below shows a decay curve for the radioactive isotope carbon-14.



(c) continued.

(ii) Use the graph to determine the half-life of carbon-14. Indicate on the graph how you arrived at your answer.

2 marks

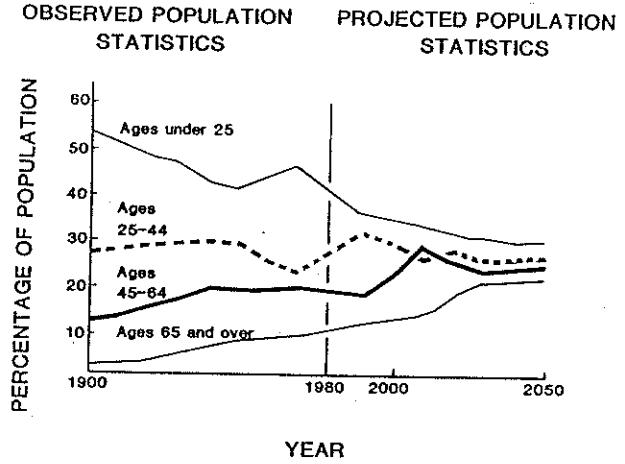
(iii) The carbon-14 decay rate for charcoal found at an ancient Homo saplens campsite was 3 nuclei per second. How old was the charcoal ?

1 mark

SEE PAGE 22

QUESTION 42.

The diagram below shows the observed and projected population statistics for Australia from the year 1900 to the year 2050.



(a) Describe the difference in the population statistics in the year 2050 compared with population statistics for 1987. Clearly explain the reasons for the difference you have described.

6 marks

SEE PAGE 23

42. (continued)

(b) How can you explain the fact that a female born in 1980 has a life expectancy of 78, but a woman who was 30 in 1980 has an expected 50 years of life remaining, or a total of 80 years ?

1 mark

(c) Explain the sharp decline in the projected proportion of 45 to 65 year olds during the years 2010 to 2030.

1 mark

SEE PAGE 24

QUESTION 43.

The diagram below relates to Question 43 a(i).

(a)

(i) Is the animal illustrated in the figure above a Prosimian or an Anthropoid ?

_____

1 mark

SEE PAGE 25

43. (continued)

The diagram below relates to Question 43 a (ii).

(ii) In what family of primates is the animal shown in the above diagram usually classified ?

_____

1 mark

SEE PAGE 26

43. (continued)

(iii) Describe FIVE ways in which the human skeleton (above the waist) differs from the skeleton of an ape such as a gorilla.

5 marks

(b) Eskimos have a short squat build, with short arms and legs, and the body is covered with a layer of fat just under the skin. Their faces are flattened, with narrow noses, and with an epicanthic fold over each eyelid. Head hair is straight and black but the beard and body hair are relatively sparse.

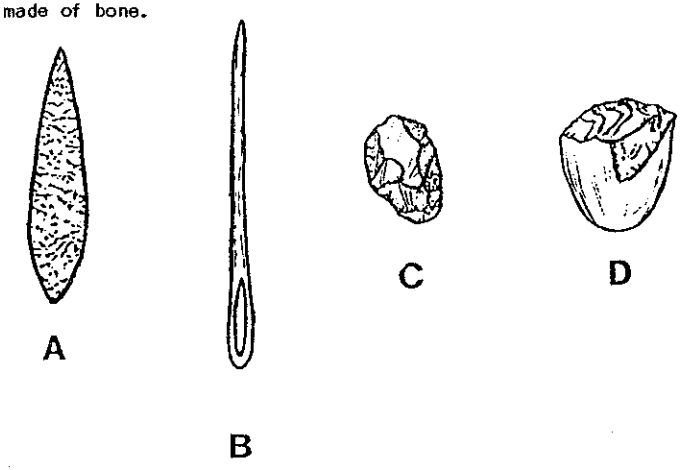
Choose ONE Eskimo characteristic which you consider to be an environmental adaptation and explain how this adaptation could have come about as a result of natural selection.

5 marks

SEE PAGE 27

QUESTION 44.

Question 44 refers to the diagram below of four artefacts which were found at hominid living sites in Africa and Europe. Artefacts A, C and D are of stone and B is made of bone.



(a) Using the letters A to D list the artefacts in order from that which is probably the oldest to that which is probably the youngest.

1 mark

(b) For EACH artefact give reasons for the position in which you placed it on your list.

4 marks

SEE PAGE 28

44. (continued)

(c) In excavating a site once occupied by a group of human ancestors, archaeologists were able to infer a great deal about the group and its culture even though no artefacts were found.

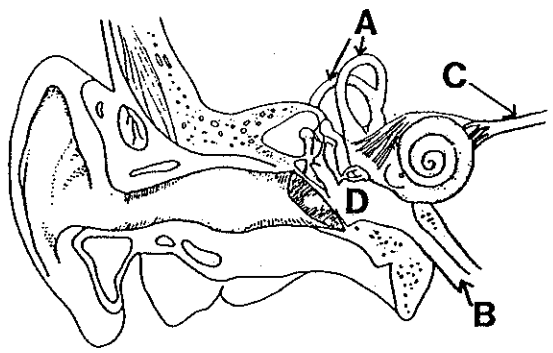
List <u>THREE</u> pieces of evidence, <u>other than artefacts</u>, which would enable archaeologists to make inferences about the culture of the occupants of the site. In each case describe inferences which could be drawn from the evidence.

3 marks

SEE PAGE 29

QUESTION 45.

Question 45 (a) refers to the diagram below of the human ear.



(a)

(I) Name the parts of the ear labelled <u>A</u> and <u>B</u> in the diagram above and explain the function of each.

<u>A</u>

Function

<u>B</u>

Function

What is the consequence of damage to the structure labelled <u>C</u> ?

3 marks

(II) Explain the route bacteria in the nasal cavity may use to enter the part of the ear labelled <u>D</u> in the diagram above.

2 marks

SEE PAGE 30

45. (continued)

(iii) How does the body normally prevent the invasion of bacteria into structure D ?

1 mark

(b) How does the body try to prevent any bacteria which contaminate the interstitial fluid from entering the bloodstream ?

1 mark

(c) Explain how interstitial fluid returns to the blood stream.

2 marks

(d) Should any bacteria manage to enter the bloodstream, what mechanisms does the body call upon to eliminate them ?

2 marks

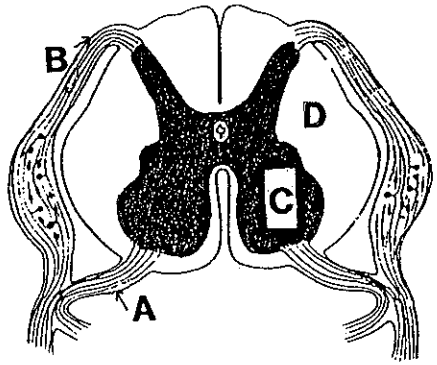
(e) Define Immunity.

2 marks

SEE PAGE 31

QUESTION 46.

Question 46 refers to the diagram below. The diagram illustrates a horizontal section through the spinal cord. A spinal nerve from the somatic division of the peripheral nervous system joins the spinal cord through a posterior root B and an anterior root A.



(a)

(i) What types of fibres are contained within the root labelled A ?

1 mark

(ii) Name TWO structures outside the central nervous system to which fibres in B are connected.

2 marks

(iii) Identify the areas within the spinal cord labelled

C _____

and

D _____

2 marks

SEE PAGE 32

46. (continued)

(b) Draw a simple labelled diagram (in "2B" pencil) of a myelinated motor/effector neuron.

6 marks

SEE PAGE 33

46. (continued)

(c) Define a hormone.

2 marks

(d) Explain <u>THREE</u> ways in which the actions of hormones on a target tissue differ from those of nerves.

3 marks

SEE PAGE 34

QUESTION 47.

In the developed countries of the world, lifestyles have changed rapidly during this century.

(a) Identify TWO changes that have taken place during this time in each of the following areas.

(i) Employment

1 mark

(ii) Leisure

1 mark

(iii) Health

1 mark

SEE PAGE 35

47. (continued)

(b) The rapidly changing lifestyles in developed countries have produced both advantages and disadvantages for human populations. A major disadvantage of modern lifestyles is their tendency to elevate stress levels.

(i) Identify TWO causes of stress in modern lifestyles.

2 marks

(ii) Describe TWO effects of prolonged stress on human health.

4 marks

SEE PAGE 36

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. (e.g. ANSWERS IN POINT FORM OR DIAGRAMS NOT EXPLAINED IN THE TEXT OF THE ESSAY.)

DO NOT WRITE YOUR ANSWER IN PENCIL.

QUESTION 48.

For centuries the Australian Aborigines were the only humans occupying the land we now know as Australia. They were gatherers and hunters, whom European explorers and later settlers dismissed as being simply a remnant population. They were seen as culturally isolated and stagnant, still following an essentially primitive, stone-age way of life. This view ignored the fact that the Aboriginal people lived in harmony with the land and with each other.

Discuss Aborigines, before the arrival of Europeans, under the following headings:

(a) The origins of the Aborigines 7 marks

(b) The search for food and water 8 marks

(c) Relationships with the land 5 marks

QUESTION 49.

The nervous and endocrine systems coordinate and integrate many body functions.

(a) Explain what an endocrine gland is and the mechanisms involved in endocrine control of body functions. Include in your answer the role of the hypothalamus and the pituitary gland. 10 marks

(b) Define the somatic and autonomic divisions of the nervous system then describe differences in the way they each exert control over body processes. Include in your answer an account of how they interact with different components of the central nervous system. 10 marks

SEE PAGE 37

1987

QUESTION 50.

During the last few years important steps have been taken to care for intellectually handicapped persons and to improve their integration into society.

(a) Explain THREE different ways in which community care of this disadvantaged group has improved. In each case clearly indicate how this has assisted their integration into society. 6 marks

Physical disabilities and financial burdens that can result from accidents, often make accident victims and their relatives members of another disadvantaged group. Increasing the public's awareness of accident dangers through educational campaigns is one way our society tries to reduce accidents.

(b) For EACH of the following types of accident:
(i) electrocution
(ii) drowning
(iii) poisoning
(iv) burns

describe TWO ways, apart from educational campaigns, in which our society tries to prevent each type of accident. Clearly explain how each preventive measure works. 8 marks

Over-exploiting an environment eventually results in ecosystem decay and this disadvantages those humans living in such an environment. As a result, governments and voluntary organizations are now involved in environmental protection.

(c) Use a specific example of a threatened ecosystem to explain how:
(i) a government
(ii) a voluntary organization

have acted to preserve that ecosystem. In your answer identify the benefits to humans that result from preventing over-exploitation of that environment. 6 marks

QUESTION 51

Write a brief account of EACH of the following:

(a) Three different ways in which the incidence of transmissible diseases has been reduced during this century. 6 marks

(b) The evidence for evolution from comparative studies of proteins and from comparative anatomy. 7 marks

(c) The role of lymphatic vessels, lymph nodes and lymphocytes as part of the protective system. 7 marks

END OF PAPER