TERTIARY ENTRANCE EXAMINATION, 1994

QUESTION/ANSWER BOOKLET

HUMAN BIOLOGY

Please place your student identification label in this box

SEA STUDENT NUMBER – In figures

In words _____

_____

TIME ALLOWED FOR THIS PAPER

Reading time before commencing work: 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 3-19
PART II	Pages 20-35
PART III	Pages 36-37
Answer Sheets for Part III	Pages 38-45
Space for rough work	Page 46

Separate Multiple Choice Answer Sheet

TO BE PROVIDED BY THE CANDIDATE

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

Special Items: A 2B pencil for the Separate Multiple Choice Answer Sheet and calculators satisfying the conditions set by the Secondary Education Authority.

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.

SEE NEXT PAGE

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 41-51 80 marks
This part consists of eleven (11) diagram and short answer questions. These **MUST** be answered in the spaces provided in this Question/Answer Booklet.
Write your answers in blue or black ball point or ink pen.

PART III Questions 52-55 40 marks
This part consists of four (4) extended answer questions.
Answer ONE question from Section A and ONE question from Section B.
The answers for PART III should be written on pages 38-45 in this Question/Answer Booklet in blue or black ball point pen 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 SEA Student Number in figures and words, in the spaces provided on the front cover of this Question/Answer Booklet.

SEE NEXT PAGE

PART I

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. In excavations of archaeological sites, artefacts are often found. Which of the following is an artefact?

   (a) A stone tool.
   (b) A fossilised bone.
   (c) Charcoal.
   (d) Fossilised food remains.

2. A researcher was testing the hypothesis : "the range of sound frequencies that a person can hear decreases with increasing age". She selected a number of subjects, both male and female, of differing ages. A sound generator was used to expose the subjects to sounds of varying frequencies over a range of volumes. The dependent variable in this experiment was the

   (a) age of the subjects.
   (b) volume of sound.
   (c) frequency of sound.
   (d) frequency range detected by the subjects.

3. A student used an anthropometer to measure the length from a person's elbow to the tip of the longest finger. This was done for a sample of students, across all classes, in a secondary school. Mean lengths for a number of age groups were calculated.

   In graphing the result the student should use

   (a) a line graph and plot mean lengths on the X-axis and age groups on the Y-axis.
   (b) a line graph and plot age groups on the X-axis and mean lengths on the Y-axis.
   (c) a histogram and plot mean lengths on the X-axis and age groups on the Y-axis.
   (d) a histogram and plot age groups on the X-axis and mean lengths on the Y-axis.

SEE NEXT PAGE

4. Which of the following is the best description of a sci fic hypothesis?

A hypothesis is

(a) an idea that is accepted by most scientists.
(b) a principle that applies in a number of situations.
(c) a generalisation that has been supported by the results of numerous experiments.
(d) a tentative explanation for observations.

5. Wherever possible, scientists express the results of their experiments as measurements rather than as descriptions of observations. The main reason for this is that

(a) there is an internationally accepted system of units of measurement so experimental results would be understood world-wide.
(b) use of measurements helps to overcome language differences between scientists from different countries.
(c) use of measurements helps to reduce any chance of bias in the reporting of experimental results.
(d) persons who are not trained in science can be used to collect the results of experiments.

6. Fred suffers from diabetes mellitus (sugar diabetes). Three times each day he must inject insulin into his body to ensure that the concentration of glucose in his blood stays at a relatively constant level. Sometimes Fred's blood glucose levels fall causing him to feel weak and dizzy.

Which of the following could cause a drop in blood glucose level?

1. Injection of too much insulin.
2. Injection of too little insulin.
3. Too much exercise.
4. Too little exercise.
5. Eating too much carbohydrate.
6. Eating too little carbohydrate.

(a) 1, 3 and 5
(b) 1, 3 and 6
(c) 2, 4 and 5
(d) 2, 4 and 6

SEE NEXT PAGE

7. When heart r cle is stretched its force of contraction increases. This reflex response of heart muscle to stretching would

(a) account for the increase in pulse rate that occurs with exercise.
(b) ensure that the stroke volume remained relatively constant.
(c) ensure that the stroke volume was about the same as the volume of blood entering the heart before each beat.
(d) prevent the heart muscle from overstretching.

SEE NEXT PAGE

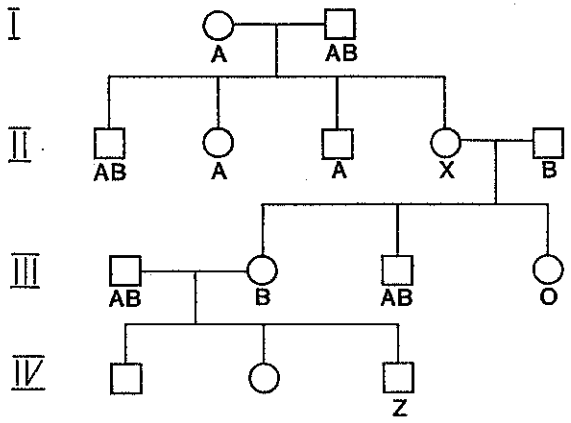
Questions 8 and 9 refers to the information below.

In the inheritance of human ABO blood groups there are three alleles:

I^A allele results in the production of antigen A on the red blood cells.
I^B allele results in the production of antigen B on the red blood cells.
i allele does not produce either antigen A or antigen B on the red blood cells.

I^A and I^B are co-dominant to each other and *i* is recessive to both I^A and I^B.

The pedigree below shows the ABO blood groups of some members of a family.



8. The genotype of individual X would be

(a) I^AI^A.
(b) *i i*.
(c) I^Ai.
(d) I^AI^B.

9. The genotype of individual Z could be

(a) I^AI^B or I^BI^B.
(b) I^AI^B or I^BI^B or I^Ai.
(c) I^BI^B or I^Ai or I^Bi.
(d) I^AI^B or I^BI^B or I^Ai or I^Bi.

SEE NEXT PAGE

10. Under certain conditions humans can suffer from hyperthermia - the body temperature rises above its normal level due to extreme environmental conditions.

Of the following factors, which ones could lead to hyperthermia when environmental temperatures are high?

1. High humidity.
2. High fluid intake.
3. Inactivity.
4. Large body size.

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

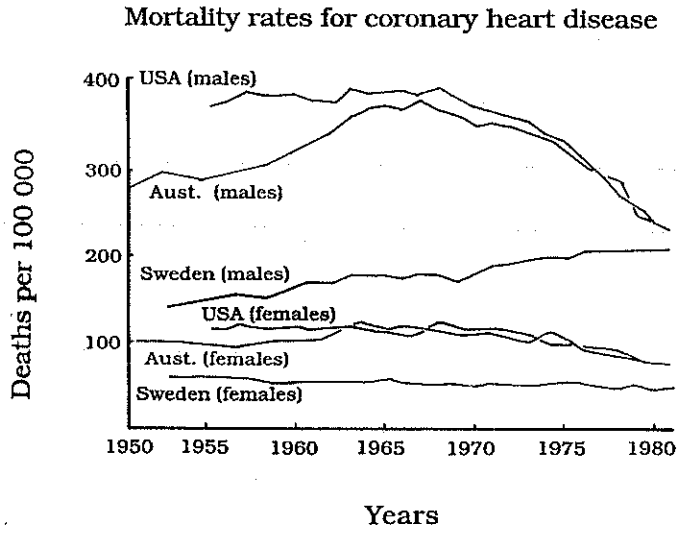
11. Until recently the famous hominid fossil "Lucy", classified as *Australopithecus afarensis*, had not been accurately dated. Using a new technique Lucy has now been dated at 3.18 million years old. The technique permits single grains of volcanic rock to be dated.

To obtain a reliable date for a fossil using this technique

(a) the grains just above the fossil would have to be older than those just below the fossil.
(b) the grains just below the fossil would have to be older than those just above the fossil.
(c) the grains just above and just below the fossil would have to be of the same age.
(d) the dates for the grains just above and below the fossil would have to match those for grains in the same stratum at other locations.

SEE NEXT PAGE

12. The graph below shows the number of deaths from heart disease in males and females from Australia, Sweden and the USA over a period of thirty years.



Which of the following would be a valid conclusion to draw from this graph?

(a) In the USA the average male was fitter in 1980 than in 1960.
(b) Education campaigns have helped to reduce death rates from heart disease in Australia and the USA.
(c) The sex of a person is an important factor in susceptibility to heart disease.
(d) Consumption of saturated fats has declined in some countries but not others.

SEE NEXT PAGE

13. One type of baldness in humans is determined by an allele that, in males, is dominant over the allele for normal hair growth. In females, the same allele is recessive to the allele for normal hair growth.

Which of the following would be correct for this type of baldness?

(a) A daughter of a bald father and a bald mother could have normal hair growth.
(b) A son of a bald mother and normal father would have a fifty percent chance of being bald.
(c) All daughters of bald mothers would be bald.
(d) All sons of bald fathers would be bald.

14. In his book "Chariots of the Gods", Erich von Daniken suggests that beings from other worlds visited Earth in prehistoric times and influenced human biological and cultural evolution. Scientists do not accept these ideas because

(a) there is no way of testing them.
(b) there is no evidence to support them.
(c) they contradict more plausible ideas.
(d) space travel over huge distances is impossible.

15. A cline is a gradual change in the frequencies of certain alleles from one end of a geographical range to the other. The change in allele frequencies would be seen as a gradual change in the characteristics of the species. In humans a cline would occur when

(a) there is interbreeding between races.
(b) populations that were previously isolated begin breeding.
(c) a population occupying a large geographical area is isolated from other populations.
(d) interbreeding and natural selection occur between populations.

SEE NEXT PAGE

16. When an ape such as a gorilla or chimpanzee walks bipedally, it appears to sway from side to side as its weight is balanced first above one foot, then above the other. Humans do not sway from side to side when they walk. This is partly because

(a) the human foot has a transverse arch as well as the longitudinal arch possessed by apes.
(b) humans have much larger buttock muscles than apes.
(c) the human foot has larger heel and ankle bones than apes.
(d) the pelvis in humans is much broader than in apes.

17. Which of the following would provide the best conditions for the fossilisation of bone?

(a) An acidic bog.
(b) An alkaline soil.
(c) Volcanic lava.
(d) A river bed.

18. Potassium-argon dating may be used to determine the

(a) relative age of fossil bones.
(b) absolute age of fossil bones.
(c) relative age of rocks.
(d) absolute age of rocks.

SEE NEXT PAGE

19. Part of the human haemoglobin molecule contains the following sequence of amino acids :

proline-serine-alanine-valine-glycine-lysine.

Some primates have the equivalent part of the haemoglobin molecule with the following sequences occurring :

PRIMATE A : lysine-alanine-threonine-valine-leucine-lysine.
PRIMATE B : proline-serine-alanine-valine-leucine-lysine.
PRIMATE C : lysine-alanine-alanine-valine-leucine-lysine.
PRIMATE D : lysine-serine-alanine-valine-leucine-lysine.

Which primate is the **MOST DISTANTLY** related to humans?

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

20. Carbon monoxide is an environmental pollutant, produced by the burning of fossil fuel. Which statement is **CORRECT** regarding the dangers of carbon monoxide?

(a) It is a carcinogen.
(b) It destroys the ozone layer.
(c) It combines with haemoglobin.
(d) It causes emphysema.

21. 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 NEXT PAGE

22. The development of agriculture accelerated human cultural evolution because it

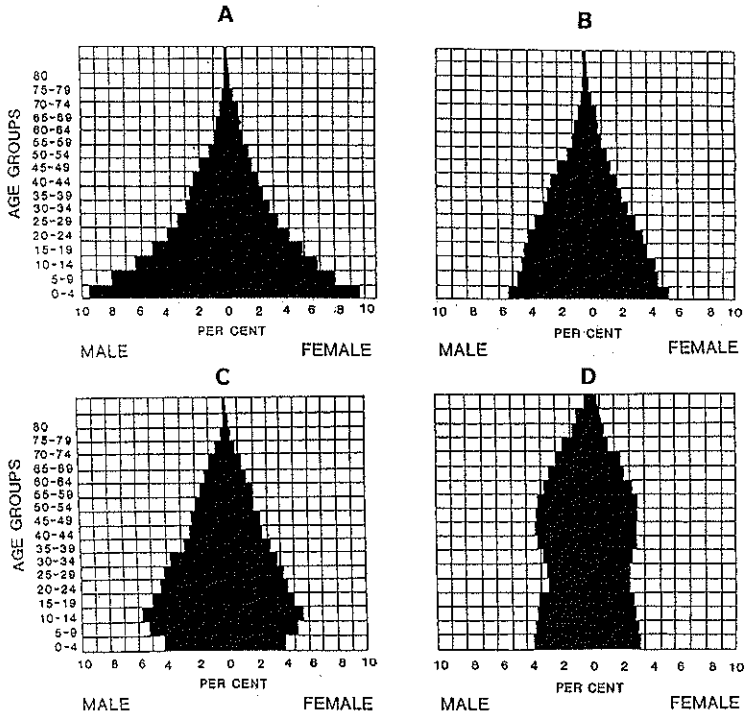
(a) was a more efficient way of providing food than hunter-gathering.
(b) allowed people to settle in one place.
(c) allowed the population to increase.
(d) occurred in several different places at the same time.

23. In a site in East Africa the remains of 60 giant baboons were found mixed with a large number of hand axes. Archaeologists would use this information as evidence for

(a) the use of spoken language by hominids.
(b) the existence of organised hunting by hominids.
(c) tool use by baboons.
(d) a hunter-gatherer lifestyle of hominids.

SEE NEXT PAGE

Questions 24 and 25 refer to a country that has undergone demographic transition during the past 100 years. The population pyramids below show the age structure at various times in that country's development.



24. What is the correct sequence for the pyramids?

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

25. At which stage in the country's development was the proportion of 30-34 year olds greatest?

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

SEE NEXT PAGE

26. A researcher was interested in finding out whether the incidence of neural tube defects in newborn children had increased over the past twenty years. Which of the following measures would give the best indication of any increase or decrease?

(a) The number of babies born with neural tube defects per year.
(b) The number of babies born with neural tube defects per thousand births.
(c) The number of neonatal deaths from neural tube defects per year.
(d) The number of neonatal deaths from neural tube defects per thousand births per year.

27. Which **ONE** of the following characteristics would be the same for a hominid and a pongid?

(a) Stereoscopic vision.
(b) Surface area of the cerebrum.
(c) Opposable first digit on all limbs.
(d) Shape of the spinal column.

28. The hypothalamus

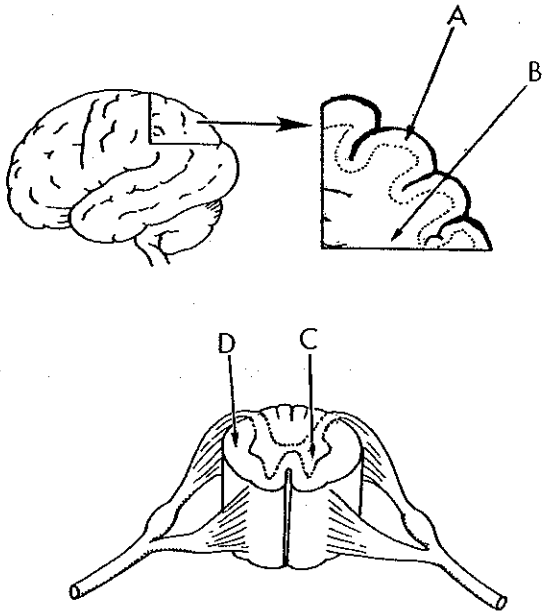
(a) is the link between the nervous system and all endocrine glands.
(b) produces oxytocin which is released by the anterior pituitary.
(c) regulates secretion of hormones by the anterior pituitary.
(d) controls all activities of the pituitary gland.

29. Receptors for "touch"

(a) are equally distributed over the skin surface.
(b) detect stimuli more easily in certain areas of the body such as the lips and tongue.
(c) are mostly associated with hair follicles.
(d) can only generate nerve impulses which travel into the central nervous system.

SEE NEXT PAGE

Questions 30 and 31 refer to the diagram of the brain and spinal cord below.



30. The enlarged section of the brain shown above is part of the

(a) cerebellum.
(b) cerebrum.
(c) thalamus.
(d) hypothalamus.

31. Which **ONE** of the following is **CORRECT** for the labels A, B, C and D on the diagram above?

	BRAIN		SPINAL CORD	
	A	B	C	D
(a)	Grey matter	White matter	Grey matter	White matter
(b)	Grey matter	White matter	White matter	Grey matter
(c)	White matter	Grey matter	Grey matter	White matter
(d)	White matter	Grey matter	White matter	Grey matter

SEE NEXT PAGE

Questions 32 and 33 refer to the list below.

1. Affects follicle development.
2. Stimulates oestrogen secretion.
3. Induces ovulation.
4. Maintains the corpus luteum.

32. Which of the functions listed above are direct actions of follicle stimulating hormone (FSH).

(a) 1 only.
(b) 1 and 2 only.
(c) 1,2 and 3 only.
(d) 1, 2, 3 and 4.

33. Which of the functions listed above are direct actions of luteinising hormone (LH).

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

34. Most hormones

(a) are proteins.
(b) are enzymes.
(c) are secreted by exocrine glands.
(d) affect metabolic activity of cells.

SEE NEXT PAGE

Questions 35 and 36 refer to the information below.

When blood pressure begins to rise, pressure receptors in the blood vessels detect the rising pressure and send nerve impulses to the cardiac centre. The cardiac centre sends nerve impulses to the pace-maker in the heart and the heart beats slower and less strongly.

35. Which of the following statements regarding the location of the cardiac centre and the nerve pathway that carries impulses to slow down the heart is **CORRECT**?

(a) The cardiac centre is in the medulla and the nerve impulses are carried by sympathetic fibres.
(b) The cardiac centre is in the medulla and the nerve impulses are carried by parasympathetic fibres.
(c) The cardiac centre is in the hypothalamus and the nerve impulses are carried by sympathetic fibres.
(d) The cardiac centre is in the hypothalamus and the nerve impulses are carried by parasympathetic fibres.

36. In the reflex described above, feedback would be achieved by nervous messages from the

(a) heart's pace-maker to the cardiac centre.
(b) cardiac centre to the pressure receptors.
(c) pressure receptors to the heart's pace-maker.
(d) pressure receptors to the cardiac centre.

SEE NEXT PAGE

37. The peripheral nervous system is subdivided into two main parts - the afferent division that carries information into the central nervous system, and the efferent division that carries information away from the central nervous system.

Which of the following **CORRECTLY** shows the functional organisation of the peripheral nervous system?

(a) Peripheral nervous system → Afferent division → Somatic division → Sympathetic division
Peripheral nervous system → Efferent division → Autonomic division → Parasympathetic division

(b) Peripheral nervous system → Afferent division → Somatic division → Paraympathetic division
Peripheral nervous system → Efferent division → Autonomic division → Sympathetic division

(c) Peripheral nervous system → Afferent division
Peripheral nervous system → Efferent division → Somatic division
Peripheral nervous system → Efferent division → Autonomic division → Sympathetic division
Peripheral nervous system → Efferent division → Autonomic division → Parasympathetic division

(d) Peripheral nervous system → Afferent division → Somatic division
Peripheral nervous system → Afferent division → Autonomic division → Sympathetic division
Peripheral nervous system → Efferent division → Autonomic division → Parasympathetic division

SEE NEXT PAGE

38. Low levels of thyroxine in the blood would result in

(a) high metabolic rate and involve feedback via the anterior pituitary.
(b) high metabolic rate and involve feedback via the posterior pituitary.
(c) low metabolic rate and involve feedback via the anterior pituitary.
(d) low metabolic rate and involve feedback via the posterior pituitary.

Question 39 refers to the table below

Hormone A	Hormone B	Hormone C
Reduces the amount of sodium in the urine	Reduces the amount of glucose in the blood	Increases the rate of the heartbeat

39. (a) Hormone A is aldosterone, B is insulin, C is adrenaline.
(b) Hormone A is antidiuretic hormone, B is glucagon, C is noradrenaline.
(c) Hormone A is aldosterone, B is glucagon, C is noradrenaline.
(d) Hormone A is antidiuretic hormone, B is insulin, C is adrenaline.

40. Areas of the central nervous system responsible for the coordination of skeletal muscle movement to maintain posture and balance are in the

(a) cerebellum only.
(b) cerebrum and cerebellum.
(c) cerebrum, midbrain and spinal cord.
(d) cerebellum, midbrain and spinal cord.

SEE NEXT PAGE

PART II

Answer **ALL** questions in the spaces provided with each question.

41. Humans colonised Australia at some time in the distant past. Scientists have examined a wide range of evidence regarding the origins of the Australian Aborigines. In answer to **EACH** of the following questions give the **MOST COMMONLY** accepted scientific opinion.

(a) Approximately how long ago do scientists consider that humans entered Australia?

(1 mark)

(b) Where did the first humans to enter Australia come from?

(1 mark)

(c) How did they get to the Australian mainland?

(1 mark)

(d) Where are they considered to have entered the Australian mainland?

(1 mark)

(e) How did they get to Tasmania?

(1 mark)

SEE NEXT PAGE

41 (continued)

(f) State **ONE** physical difference between mainland and Tasmanian Aborigines.

(1 mark)

(g) State **ONE** cultural difference between mainland and Tasmanian Aborigines.

(1 mark)

(h) State **ONE** reason why physical and cultural differences developed between mainland Australian and Tasmanian Aborigines.

(1 mark)

SEE NEXT PAGE

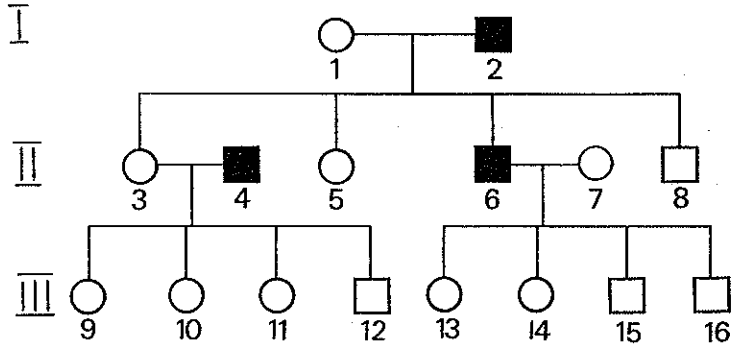
42. Human skin colour is not just black or white but can be many shades of brown between the two extremes.

Explain how there can be such a range of skin colours.

(3 marks)

SEE NEXT PAGE

43. The pedigree below shows the inheritance in a family of an X-linked (sex linked) characteristic. Individuals with the characteristic are shown as black circles or squares. In the third generation III it has not yet been determined whether the individuals have the characteristic or not.



a) Is the allele that determines this characteristic dominant or recessive? Give **ONE** reason for your answer.

(1 mark)

(b) Are there any females in the pedigree who do **NOT** have the characteristic and are definitely **NOT** carriers of the allele for the characteristic. If so, write down their numbers.

(1 mark)

SEE NEXT PAGE

43 (continued)

(c) In the third generation III are there any males who could show the characteristic? If so, write down their numbers.

_____

(1 mark)

(d) In the third generation are there any females who could show the characteristic? If so, write down their numbers.

_____

(1 mark)

(e) In the third generation are there any females who could be carriers? If so, write down their numbers.

_____

(1 mark)

(f) If individual 8 married a carrier female, what is the probability that any male children would develop the characteristic?

_____

(1 mark)

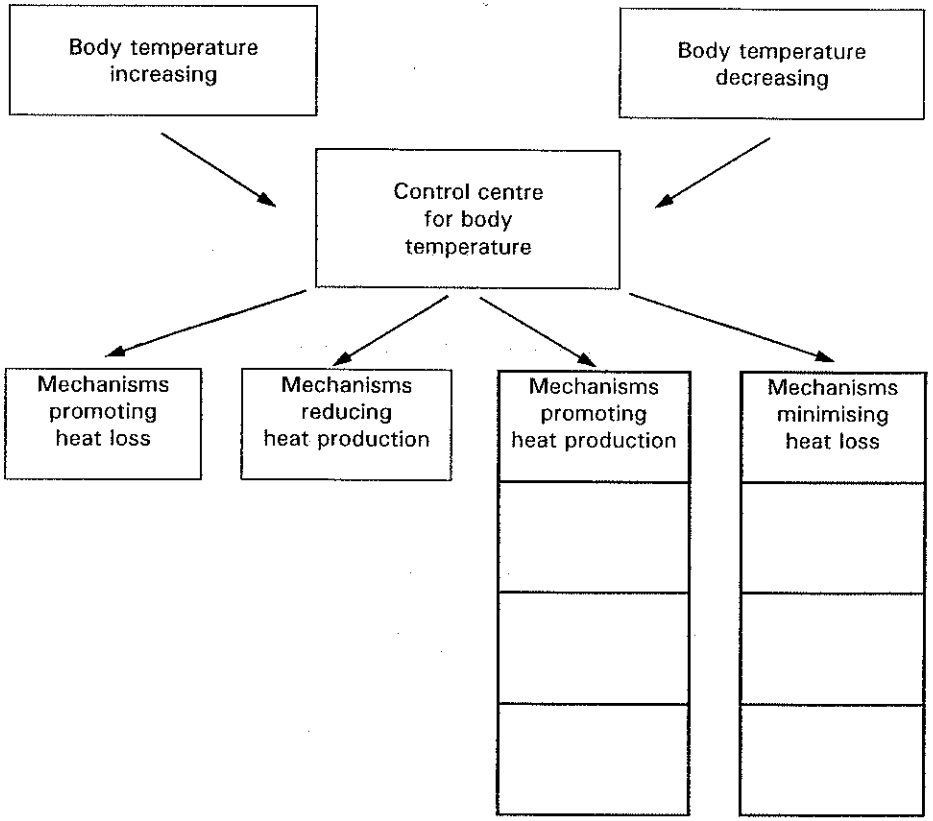
(g) If individual 8 married a carrier, what is the probability that any female children would be carriers?

_____

(1 mark)

SEE NEXT PAGE

Question 44 refers to the diagram below illustrating some of the processes involved in the regulation of body temperature.



44. (a) Complete the diagram by filling in the blank boxes with examples of the mechanisms involved in promoting heat production and in minimising heat loss.

(6 marks)

(b) Where in the human body is the control centre for body temperature located?

_____

(1 mark)

SEE NEXT PAGE

45. Explain the difference between EACH of the following pairs of terms:

(a) **A vaccine** and an **antibiotic.**

(2 marks)

(b) **Viruses** and **bacteria.**

(2 marks)

(c) **Active immunity** and **passive immunity** to a disease.

(2 marks)

SEE NEXT PAGE

45 (continued)

(d) **Transmission of disease by droplets** and **transmission by vectors.**

(2 marks)

SEE NEXT PAGE

46. List **THREE** precautions that people can take to prevent the spread of human immunodeficiency virus (HIV). For each precaution explain how it helps to prevent the spread of the virus.

(6 marks)

SEE NEXT PAGE

47. A fossilised skull and jaw bone were uncovered in different locations but from the same stratum in a gravel pit at Piltdown in England. The fossils were assumed to be of the same age and became known as Piltdown Man. They were shown to be a hoax when fluorine analysis showed that the skull was much older than the jaw bone.

(a) Why might scientists have assumed the skull and jaw bone to be of the same age?

(1 mark)

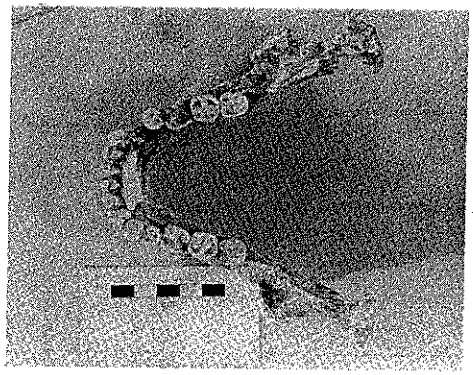
(b) Explain how fluorine analysis could show that the two fossils were of different ages.

(4 marks)

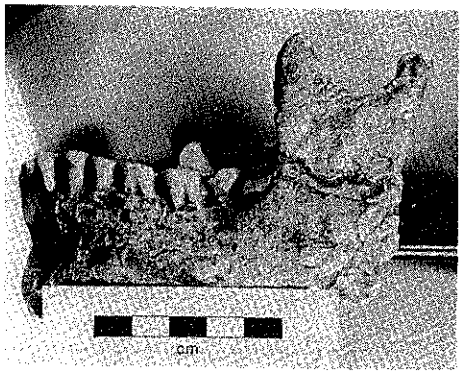
SEE NEXT PAGE

Question 48 refers to the teeth and jaw bones illustrated below.

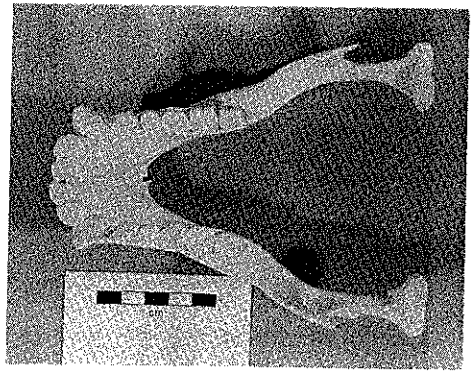
A



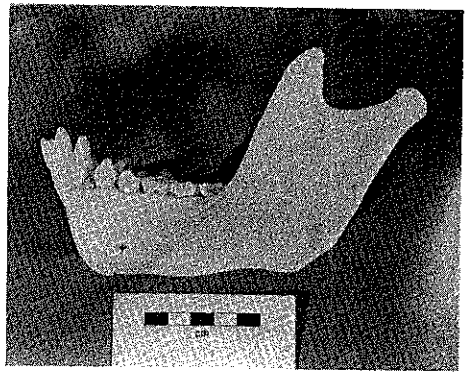
A



B



B



SEE NEXT PAGE

48. (a) Examine the teeth and jaw bones. Which **ONE** is human, A or B. State THREE features which you can clearly see in the diagrams that enable you to reach your decision.

_____

_____

_____

_____

(3 marks)

(b) Suggest **THREE** reasons for the differences between the two with reference to the non-human jaw and teeth.

_____

_____

_____

_____

(3 marks)

SEE NEXT PAGE

49. Human activities are resulting in widespread changes to our environment.

(a) One of the predicted results of environmental change is an increase in the incidence of skin cancers. What environmental change would contribute to the increased incidence and why is the change occurring?

(4 marks)

b) Sea levels are predicted to rise due to climatic changes. Why is world climate expected to change and why will the change result in the sea level rising?

(5 marks)

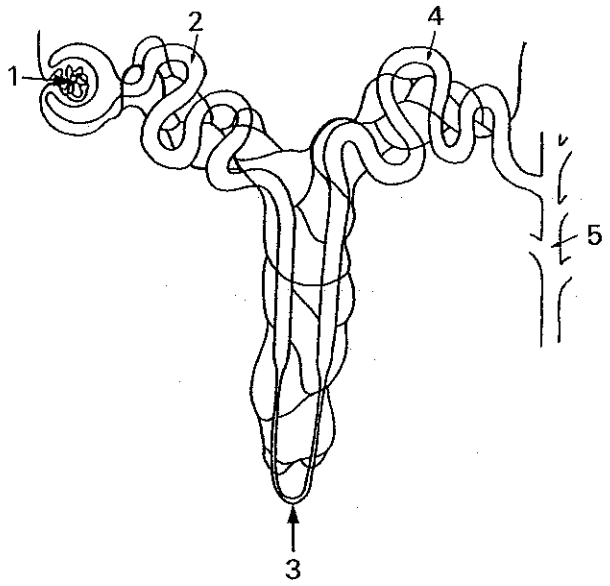
SEE NEXT PAGE

50. Insert a word or words (in each of the spaces provided) that CORRECTLY complete each of the following sentences. **NOTE** 1 mark is allocated for each correct sentence. (10 marks)

1. The anterior chamber of the eye contains the _____ humour and the posterior chamber of the eye contains the _____ humour.
2. The pigmented structure that gives the eye its colour is called the _____.
3. The two types of photoreceptor cells within the retina are called the _____ and the _____.
4. From these photoreceptor cells impulses are passed to neurons which carry these impulses to the brain via the _____ nerve.
5. The ability of the _____ of the eye to change shape and focus light rays from distant or near objects is called _____.
6. Inside the middle ear are three tiny bones called the _____, _____ and _____.
7. The _____ tube allows air pressure to equalise on each side of the ear drum.
8. Inside the _____ and _____ of the inner ear are sensory hair cells that provide information about the head when it is stationary.
9. The actual organ of hearing is called the organ of _____ and lies within a passage in the _____.
10. The cranial nerve that carries information about balance is called the _____ nerve.

SEE NEXT PAGE

51. The diagram below shows a section through a nephron with its associated blood supply.



(a) Name the parts labelled :

(1) _____

(2) _____

(3) _____

(4) _____

(5) _____

(5 marks)

(b) What process occurs at "1"?

_____

(1 mark)

SEE NEXT PAGE

51 (continued)

(c) Name **TWO** substances (other than water) reabsorbed at the region of the nephron labelled "2".

_____

(2 marks)

(d) Name **ONE** substance secreted from capillaries into the region of the nephron labelled "3".

_____

(1 mark)

(e) Name the hormone acting on the region of the nephron labelled"5".

_____

(1 mark)

(f) When the concentration of the hormone (acting on the region of the nephron labelled "5") in the plasma is high what effect does this have on the region of the nephron labelled "5".

_____

_____

_____

(1 mark)

SEE NEXT PAGE

PART III

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 answer. **DO NOT WRITE YOUR ANSWERS IN PENCIL.** Write your answers on the lined pages 38-45 in this booklet.

SECTION A

ANSWER EITHER QUESTION 52 OR QUESTION 53 - NOT BOTH.

52. (a) Describe the structural components of a myelinated neuron and explain how each component relates to the function that particular component performs.

(10 marks)

(b) Neurons in a spinal reflex arc may be classified into three types depending on the specific function they perform. Name each of these three types of neuron, state the location of the cell body of each, then for each type state how it is functionally different from the other two.

(10 marks)

OR

53. (a) Disease causing organisms that enter the body are often eliminated by an immune response. Describe the immune response.

(12 marks)

(b) A researcher wished to test the effectiveness of a new drug that may control high blood pressure. Describe how the effectiveness of such a drug could be scientifically evaluated.

(8 marks)

SEE NEXT PAGE

SECTION B

ANSWER EITHER QUESTION 54 OR 55 - NOT BOTH

54. The characteristics of species change over time. This is known as evolution. Describe the mechanisms by which new species evolve. Where possible use specific examples to illustrate your points.

(20 marks)

OR

55. Aborigines living in inland Australia experience harsh desert conditions. Eskimos living in the Arctic experience conditions of extreme cold. Explain how specific physical characteristics allow persons from each group to survive in their respective habitats.

(20 marks)

END OF QUESTIONS

1994

SEE NEXT PAGE