WESTERN AUSTRALIA

TERTIARY ADMISSIONS EXAMINATION
1983

Please place one of your Candidate Identification labels in this box

HUMAN BIOLOGY

CANDIDATE NUMBER: In figures

In words

TIME ALLOWED FOR THIS PAPER:

Reading time before commencing: Ten minutes
For working of paper: Three hours

MATERIAL REQUIRED/RECOMMENDED FOR THIS PAPER:

TO BE PROVIDED BY THE SUPERVISOR

Question Paper comprising PART I Page 3 - 32
PART II Pages 33 - 35
Essay sheets for PART II Pages 36 - 44
Space for rough work Page 45
Separate Multiple Choice Answer Sheet.

TO BE PROVIDED BY THE CANDIDATE

Standard Items

Pens, pencils, rubbers, ruler.

Special Items

A 'B' or '2B' pencil for the Separate Multiple Choice Answer Sheet.

NOTE: No other items may be taken into the examination room.

INSTRUCTIONS TO CANDIDATES

See Page 2.

SEE PAGE 2

INSTRUCTIONS TO CANDIDATES:

PART I consists of 40 multiple choice questions (80 marks), 20 word-completion questions (40 marks), and 6 diagram completion questions (80 marks).

Answer ALL questions in PART I.

Questions 1 - 40 should be answered on the Separate Multiple Choice Answer Sheet. USE A 'B' OR '2B' PENCIL. DO NOT USE A BALL POINT OR INK PEN.

Questions 41 - 66 should be answered in the spaces provided on the question paper.

PART II consists of two (2) sub-sections, ONE (1) question from each sub-section should be answered. Each question MUST come from a different sub-section (20 marks each).

The essays for PART II should be written on Pages 36 - 44 of the question paper.

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 the question paper AND on the Separate Multiple Choice Answer Sheet.

SEE PAGE 3

PART I

1. Which of the following terms describes the sum total of all the chemical reactions in the body?

   a) anabolism
   b) assimilation
   c) catabolism
   d) metabolism

2. Which of the following is NOT a function of epithelial cells?

   a) absorption
   b) protection
   c) sensation
   d) secretion

3. The main difference between Cro Magnon man and modern man is the

   a) cranial capacity
   b) shape of the jaw
   c) prominence of brow ridges
   d) cultural development

4. Two weeks after conception, the inner cell mass of the blastocyst has developed three germ layers: ectoderm, mesoderm and endoderm. The ectoderm will differentiate into

   a) muscle, bone and cartilage
   b) nervous system and epidermis
   c) lining of the digestive system
   d) blood vessels

5. The practice of preparing vegetables for cooking and then leaving them to stand in water before use is not desirable. Which of the following pairs of vitamins is most likely to be lost from the vegetables during this time?

   a) vitamin B and vitamin C
   b) vitamin A and vitamin C
   c) vitamin D and vitamin B
   d) vitamin D and vitamin A

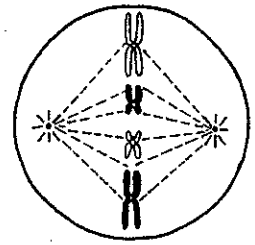
6. Identical twins are the result of

   a) two sperm fertilizing one ovum
   b) two ova fertilized by two sperm
   c) one sperm dividing and fertilizing two ova
   d) one fertilized ovum dividing to form two embryos

SEE PAGE 4

Figure 1 below represents a cell in the process of mitosis. Questions 7 and 8 refer to this diagram.

Fig. 1



7. The phase of mitosis shown in the diagram is

   a) telophase
   b) prophase
   c) anaphase
   d) metaphase

8. The next event to occur would be

   a) the centrioles dividing
   b) the centromeres splitting
   c) chromatids moving to opposite poles of the cell
   d) division of the cytoplasm

9. If the sympathetic nerve to the heart was cut, the heart rate would be expected to

   a) increase
   b) decrease
   c) stay the same
   d) increase then decrease

10. Blood cells which phagocytose invading bacteria are

   a) erythrocytes
   b) thrombocytes
   c) leucocytes
   d) platelets

11. The chemical acetylcholine is responsible for

   a) supplying energy to a contracting muscle
   b) transmitting the nerve impulse across the neuromuscular junction
   c) preventing continual stimulation of the muscle by nerve impulses
   d) removing wastes from actively contracting muscles

SEE PAGE 5

12. Which one of the following pairs of statements about human sperm and ova is NOT true?

   a) ova are usually released one at a time; sperm are ejaculated by the million.
   b) ova have a large amount of cytoplasm; sperm have very little cytoplasm.
   c) sperm determine the sex of the baby; ova do not carry sex chromosomes.
   d) sperm are capable of locomotion; ova are not capable of independent locomotion.

13. It has been observed that after ingestion of alcohol, the volume of urine produced increases. Which of the following statements would be the best explanation of this observation?

   a) Alcohol inhibits antidiuretic hormone secretion from the pituitary gland.
   b) Alcohol stimulates antidiuretic hormone secretion from the adrenal gland.
   c) Alcohol stimulates antidiuretic hormone secretion from the pituitary gland.
   d) Alcohol inhibits antidiuretic hormone secretion from the adrenal gland.

14. Which of the following does NOT help to maintain the diffusion gradient between the alveoli and the capillaries?

   a) combination of oxygen with haemoglobin in the red blood cell
   b) the beating of the heart to maintain blood flow
   c) continual movement of tidal air through the bronchioles
   d) accumulation of carbon dioxide within the alveolar sac

15. In the fetus, blood passes directly from the right side of the heart to the left side of the heart through the

   a) pulmonary artery
   b) ductus venosus
   c) ductus arteriosus
   d) foramen ovale

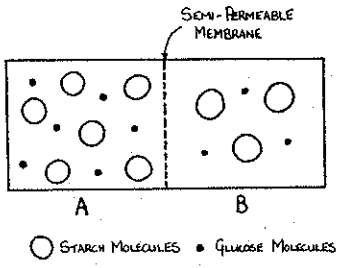
16. The hominid which lived in Europe, Asia and Africa until approximately 40,000 years ago and which was characterised by a "bun" shape at the back of the skull and a strongly receding forehead was

   a) Homo erectus
   b) Homo sapiens sapiens
   c) Homo sapiens neaderthalensis
   d) Australopithecus africanus

SEE PAGE 6

17. Refer to the following diagram of compartments containing solutions separated by a semi-permeable membrane.

Fig. 2



If the membrane is permeable to glucose, but not to starch, the most likely nett movements in the above system would be

a) glucose from A to B and no nett water movement
b) glucose from A to B and water from B to A
c) glucose from B to A and water from A to B
d) water from A to B and glucose from A to B

18. Blood returning from the brain to the heart will enter the

a) right atrium
b) right ventricle
c) left atrium
d) left ventricle

19. The Eustachian tube

a) allows air from the middle ear to the inner ear
b) forces the ear drum inwards when sound reaches it
c) permits air to enter and leave the middle ear
d) allows fluid in the inner ear to drain into the pharynx

20. Which one of the following contraceptive methods does NOT prevent the formation of a zygote?

a) intrauterine device
b) oral steroid hormones (contraceptive pill)
c) condom
d) diaphragm inserted in the vagina

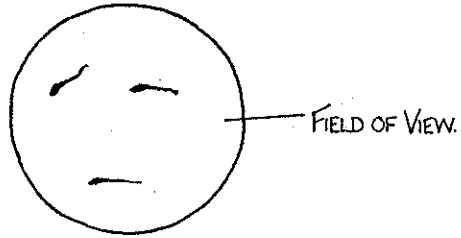
SEE PAGE 7

Refer to the following information for questions 21 and 22.

A laboratory technician was examining a semen sample to find the number of sperm per ml and observe the sperm mobility.

21. She viewed a drop of diluted semen under a microscope and observed the following:

Fig. 3



If the diameter of the field of view was 0.3mm, what was the approximate length of a sperm?

a) 150μm
b) 60μm
c) 600μm
d) 15μm

22. Four microscopes were set up in the laboratory.

Microscope No.	Objective	Ocular
1	x 10	x 10
2	x 40	x 5
3	x 20	x 15
4	x 20	x 10

Under which two miscroscopes did the sperm appear to be moving at the same rate?

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

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23. The developing baby is MOST vulnerable to radiation and drugs which may cause abnormal development during

a) the first three months of pregnancy
b) the second three months of pregnancy
c) the last three months of pregnancy
d) the birth process

24. It is often difficult to classify fossil organisms beyond the genus to the species level. The main reason for this problem is that

a) many organisms are destroyed during the fossilization process
b) fossil organisms cannot interbreed
c) the reproductive organs of the fossil organisms are mostly obscured or absent
d) living organisms have evolved considerably since the fossil organisms existed

25. A primate which has a prehensile tail, brachiates as its main method of locomotion, has an arboreal habitat and lives in South America would belong to the SUBORDER

a) Prosimii
b) Cercopithecoidea
c) Anthropoidea
d) Hominoidea

26. Consider the table below, which indicates the parts of the digestive tract where chemical digestion of various food groups occurs.

Section of digestive tract	Food 1	Food 2	Food 3	Food 4
mouth	✓			
stomach		✓		
small intestine	✓	✓	✓	

Which of the above foods is most likely to be protein?

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

SEE PAGE 9

27. The inheritance of the trait "piebald hair" (a condition showing patches of white hair) is shown in a family pedigree below.

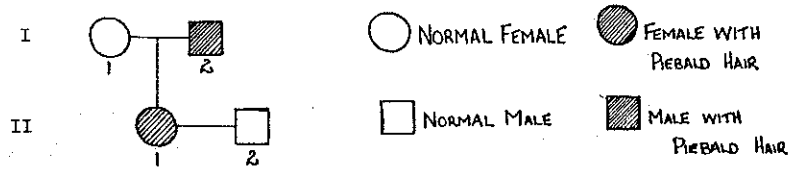

Fig. 4

Both I.1 and I.2 are homozygous, at the locus being considered. What proportion of the offspring of II.1 and II.2 is expected to have "piebald hair"?

a) none
b) all
c) 1/2
d) 1/4

28. Which of the following is NOT characteristic of arteries?

Arteries

a) have thicker walls than veins
b) carry blood away from the heart
c) contain valves to prevent backflow
d) carry blood at a higher pressure than do veins

29. The sequence of light passing through the eye is

a) cornea, vitreous humour, lens, aqueous humour, retina
b) retina, aqueous humour, lens,vitreous humour, cornea
c) retina, vitreous humour, cornea, aqueous humour, lens
d) cornea, aqueous humour, lens,vitreous humour, retina

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30. The graph below shows the volumes of air exchanged by the lungs.

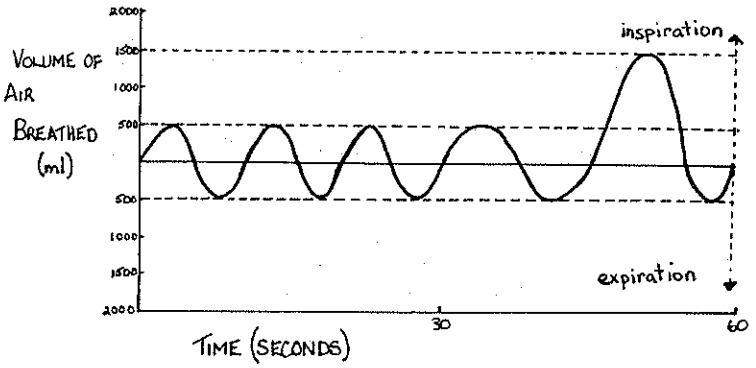

Fig. 5

Which of the following statements about the person's breathing is NOT correct?

a) The person breathed in 1.5 litres of air during the first half minute and breathed in 2.0 litres of air during the second half minute.
b) The breathing rate over the period of recording was 10 breaths per minute.
c) The breathing rate was faster during the first half minute than during the second half minute.
d) The total volume of air breathed out during the period of recording was 2.5 litres.

31. Which of the following statements about the female reproductive system at the time of ovulation is NOT correct?

a) The concentration of luteinizing hormone has just reached its peak.
b) The endometrium is growing thicker.
c) Cervical mucous is thin and watery.
d) The corpus luteum is breaking down.

SEE PAGE 11

Refer to the graph in Fig. 6 . showing the activity of two different enzymes of the human digestive tract, for questions 32 and 33.

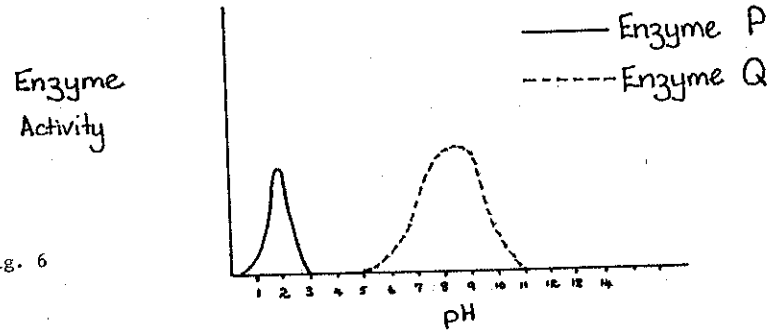

Fig. 6

32. Enzyme Q is most likely to be

a) an amylase
b) a lipase
c) a protease
d) it is impossible to say

33. Which of the following statements about enzymes P and Q is true?

a) Enzyme P is most active in an acidic medium and enzyme Q is most active in an alkaline medium.
b) Enzyme Q will only operate in one part of the digestive tract, but enzyme P will operate all along the digestive tract.
c) Enzyme Q will only break down carbohydrate but enzyme P will break down carbohydrate, lipid and protein.
d) Enzyme P will be active over a wider pH range than enzyme Q.

34. When using a sphygmomanometer to measure the blood pressure of a healthy young adult

a) the systolic pressure would be approximately 75mm Hg
b) the systolic pressure would be lower than the diastolic pressure
c) the pressure of the oxygenated blood would be called systolic and that of the deoxygenated blood would be diastolic
d) the systolic pressure is that at which the sounds through the stethoscope first become audible

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35. The pulmonary artery would contain blood with

a) a low concentration of carbamino-haemoglobin and a high concentration of oxy-haemoglobin
b) a low concentration of carbamino-haemoglobin and a low concentration of dissolved oxygen
c) a low concentration of oxy-haemoglobin and a high concentration of bicarbonate ions
d) a low concentration of dissolved oxygen and low concentration of bicarbonate ions

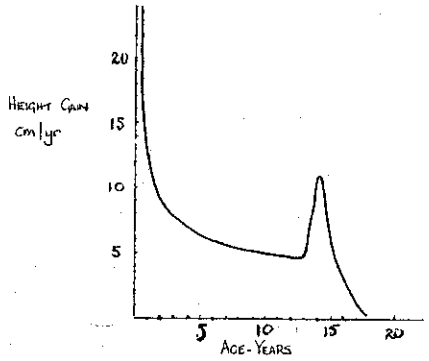
36. Evolutionary changes in the hominids from the time of the australopithecines to modern humans include

a) changes from quadrupedalism to bipedalism
b) an approximate tripling in the cranial capacity
c) a decrease in average body size
d) evolution of the foot from an ape-like to a human-like form

Refer to the graph in Fig. 7 to obtain information for questions 37 and 38.

Fig. 7

Curve showing height gain for an individual boy from birth to 20 years



37. The boy's maximum growth rate occurred during

a) 0-2 years
b) 4-6 years
c) 10-12 years
d) 14-16 years

38. A similar graph drawn of the height gain of a particular girl between the ages of 8 and 20 years would be

a) to the right of the graph for this boy
b) to the left of the graph for this boy
c) above the graph for this boy
d) impossible to say with certainty

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39. Oxygen is transported in the blood combined with haemoglobin in the form of oxy-haemoglobin.

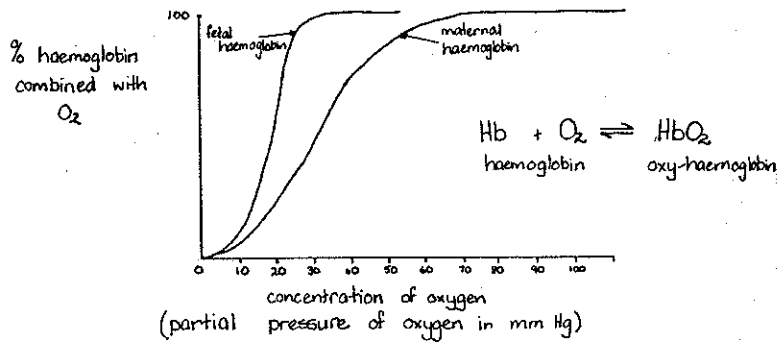

Fig. 8

Using the information in the graph above determine the INCORRECT statement.

a) As the maternal blood passes through active muscle tissue the percentage of haemoglobin combined with oxygen decreases.

b) At an oxygen concentration of 35 mm Hg the fetal blood contains a higher percentage of oxy-haemoglobin than the maternal blood.

c) As maternal blood passes through capillaries of the alveolus the percentage of oxy-haemoglobin increases.

d) At an oxygen concentration of 20 mm Hg the maternal blood contains a higher percentage of oxy-haemoglobin than the fetal blood.

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40. Parts of four hominid skulls were embedded at differing depths in the wall of a cave. There was no geological evidence of faulting or folding. After a series of tests the following results were obtained but the data was incomplete. It is known that generally the older the bones, the higher the fluoride content and the lower the concentration of C^{14}.

	Estimated cranial capacity	Depth	Relative fluoride content	Relative C^{14} content
Skull 1		10m	1.5	
Skull 2	1200ml			4.0
Skull 3	1500ml	5m		1.0
Skull 4	600ml		1.0	

Which skull is probably the most recent?

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

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In questions 41-60 give the most appropriate term to match the statement. Answer the questions in the spaces provided.

41. A rhythmic series of muscle contractions which move food along the gastro-intestinal tract. _____

42. A series of tubules and vesicles forming a network through the cytoplasm of the cell. _____

43. The pointed hand-axe tools produced by Homo erectus. _____

44. The division of the nervous system which is responsible for involuntary control of the internal environment. _____

45. The type of cell division which produces the gametes. _____

46. The tube which carries urine from the kidney to the bladder. _____

47. Vision which is three dimensional. _____

48. The flap of cartilage which covers the upper end of the trachea. _____

49. The condition where the two adult sexes of a species are recognizably different. _____

50. The somatotype which is characterized by a rounded body shape and heavy build. _____

51. The process of human birth. _____

52. The organ which stores bile. _____

53. The double membrane of epithelial tissue which surrounds each lung. _____

54. The clumping together of red blood cells caused by antigen-antibody reactions. _____

55. The main nitrogenous waste in urine. _____

56. The covering of fatty material surrounding the axon of some neurons. _____

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57. The study of ageing. _____

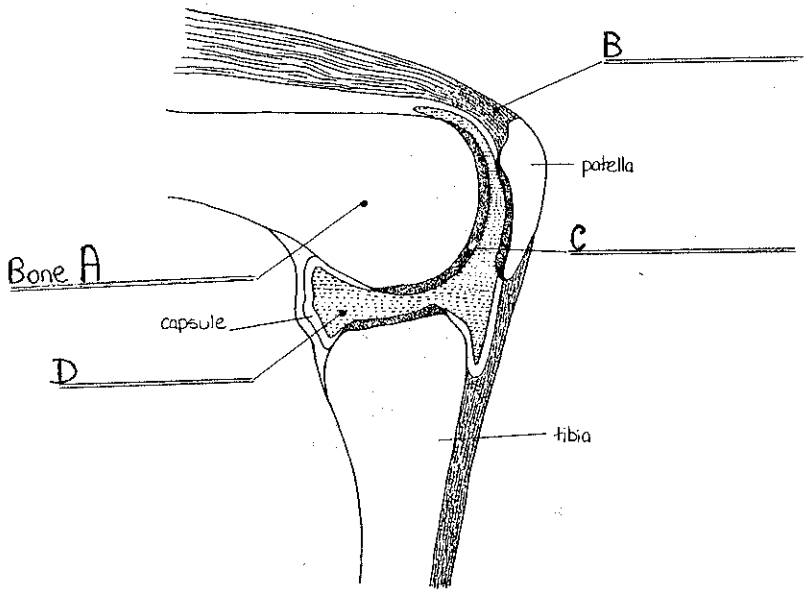
58. The cells of the testis which secrete the hormone testosterone. _____

59. A heritable change in the genetic material or its detectable effects in the phenotype. _____

60. An infectious organism which cannot be seen under a light microscope and requires living tissue to survive and reproduce. _____

SEE PAGE 17

61. Fig. 9. Diagram of a sagittal section through a knee joint



a) Label the structures A,B,C and D in the spaces provided on Fig. 9. (4 marks)

b) What types of movement are allowed by this joint?

_____ (2 marks)

c) Explain the roles played by structures C and D in the efficient functioning of the knee.

_____

_____

_____ (2 marks)

d) Distinguish clearly between the functions of ligaments and tendons.

_____

_____

_____ (2 marks)

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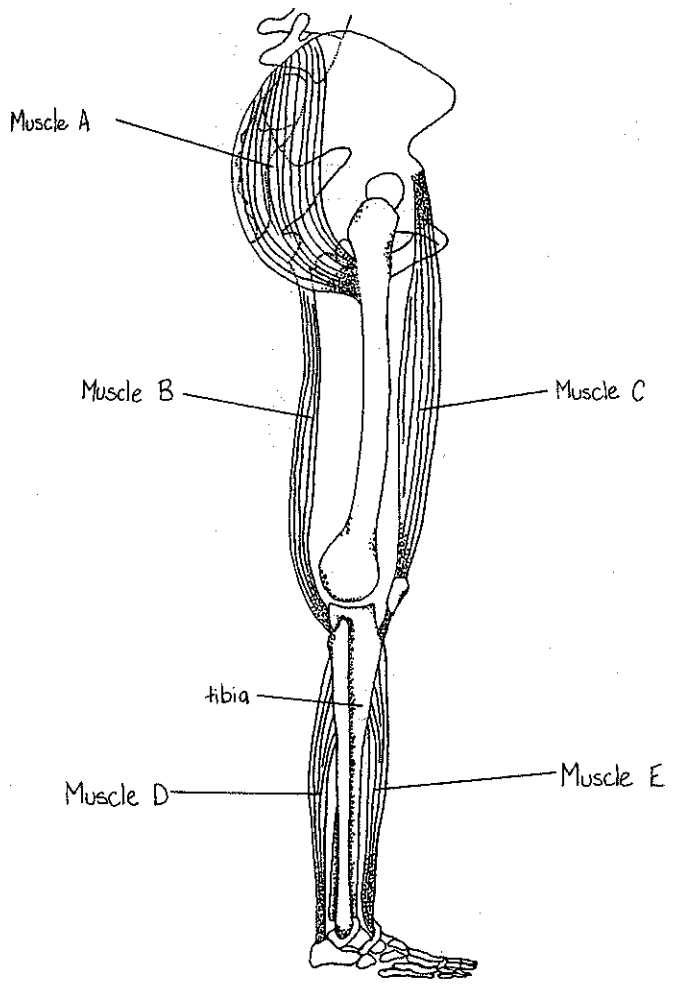
61. (continued)

Fig. 10 Diagram of some of the muscles used in walking and standing



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e) An erect posture is maintained by preventing movement about the hip, knee and ankle joints. Explain how muscles labelled in the diagram act in stabilising the hip and knee joint.

(3 marks)

f) Why is it that these muscles do not become exhausted when standing for extended periods of time?

(2 marks)

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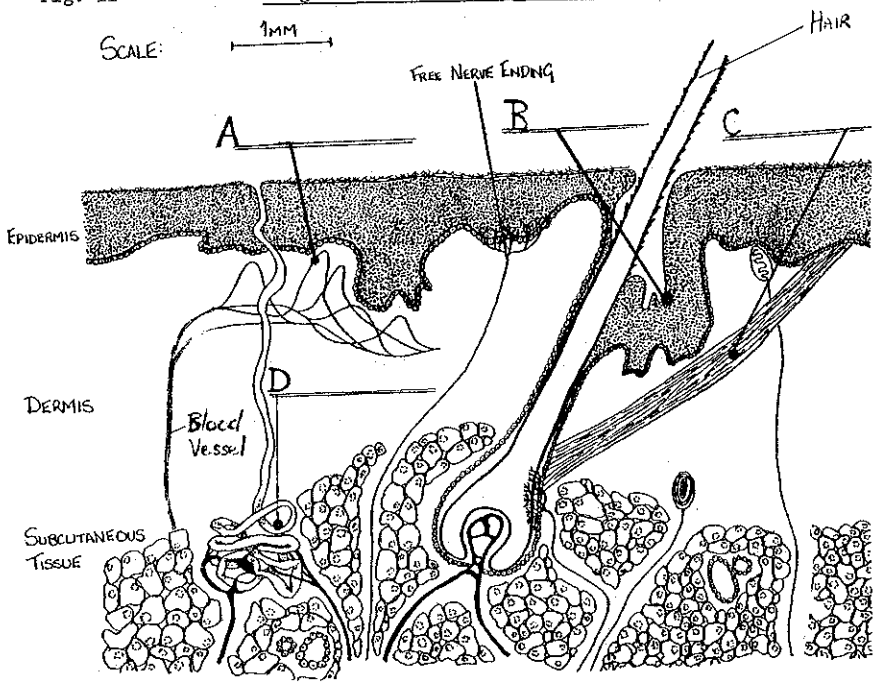
62.

Fig. 11 Diagram of a section through human skin



a) Label the structures indicated as A,B,C and D in the spaces provided on Figure 11. (4 marks)

b) Explain how structures A and D contribute to homeostasis of the body.

i) Structure A _____

_____

_____

_____

_____

_____ (2 marks)

ii) Structure D _____

_____

_____

_____

_____

_____ (2 marks)

SEE PAGE 21

62. (continued)

c) If the free nerve ending (labelled) was stimulated by the pain of touching a very hot object, briefly outline the pathway of the nerve impulse which would result in the hand being removed.

_____

_____

_____

_____

_____

_____ (2 marks)

d) Considering the protective functions of the skin, predict <u>two</u> immediate consequences of a severe burns victim remaining untreated.

_____

_____

_____

_____

_____

_____ (2 marks)

e) Skin colour is due to the amount of melanin pigment present.

i) In which major skin layer (indicated down the left hand side of Figure 11) is melanin found? What is the function of melanin?

_____

_____

_____

_____

_____

_____ (2 marks)

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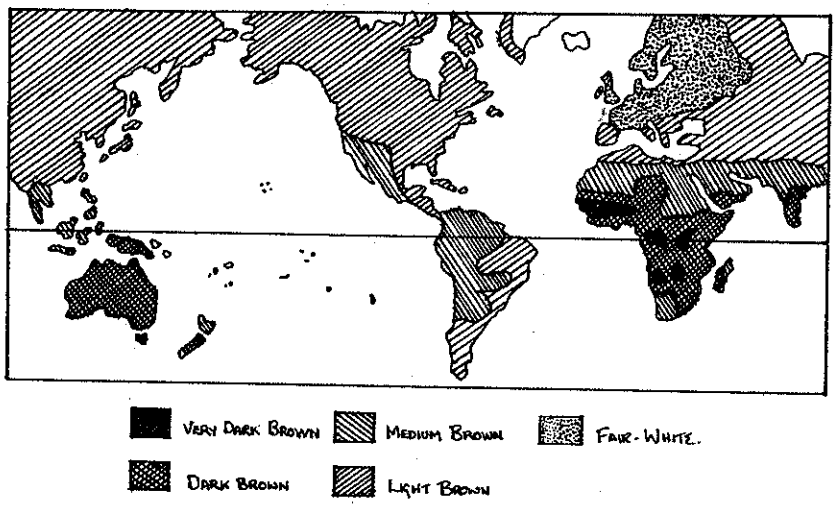
62. (continued)

Fig. 12 Distribution of human skin colour in the fifteenth century



ii) Observe the world distribution of skin colour indicated in Figure 12.

Then

Propose a hypothesis to account for this distribution.

(2 marks)

iii) Explain why rickets (a vitamin D deficiency disease) is primarily a disease of the temperate regions of the earth and rarely exists in tropical regions.

(2 marks)

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62. (continued)

iv) Australians of European ancestry have the highest incidence of skin cancer in the world. Explain why, and outline one public health measure which could help to reduce this high risk.

(3 marks)

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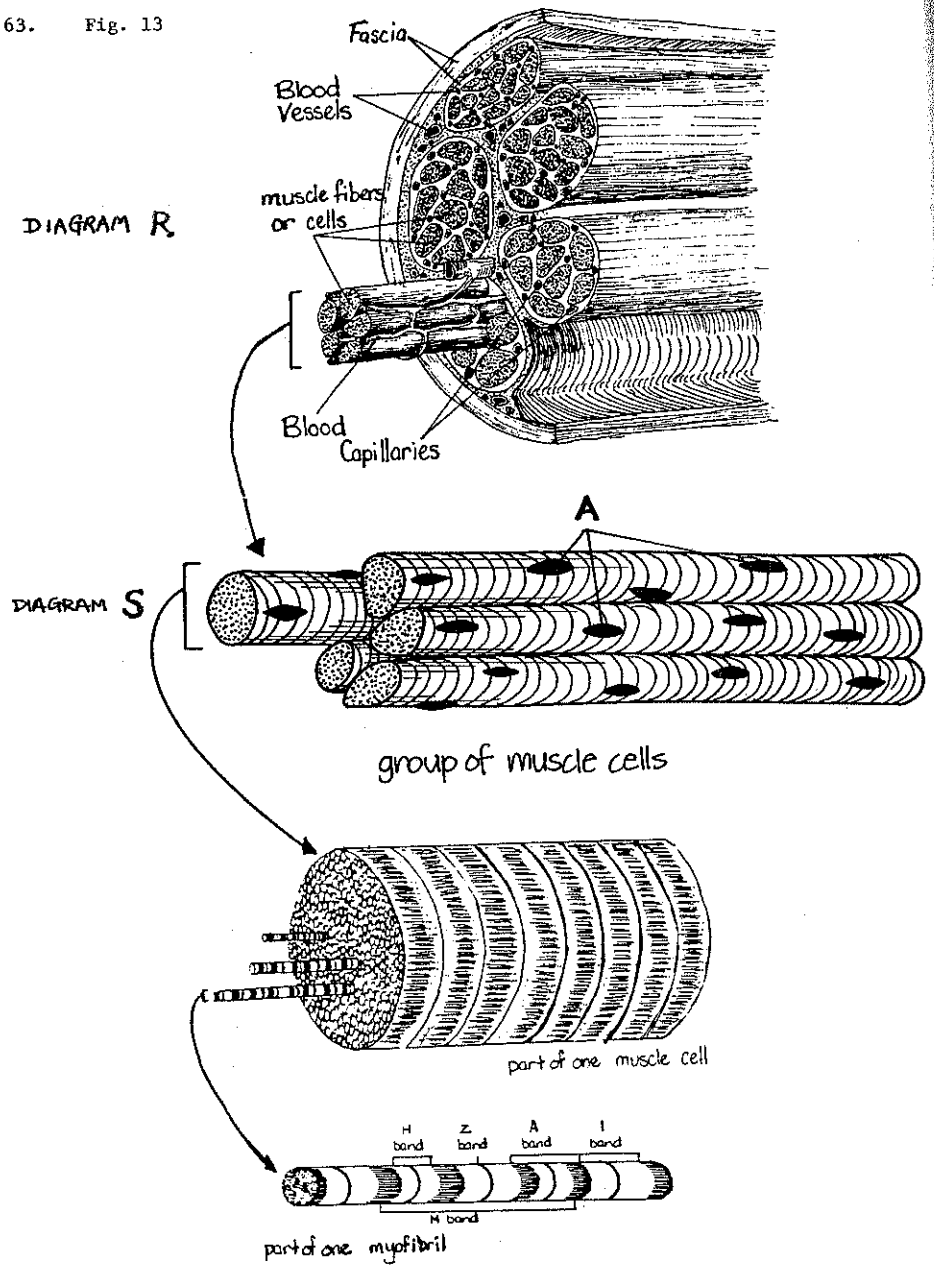
63. Fig. 13



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63. (continued)

Fig.13 shows a diagrammatic representation of the structure of muscle at increasing levels of magnification.

a) Describe an area in diagram R in which you would find

i) connective tissue

_____ (1 mark)

ii) epithelial tissue

_____ (1 mark)

b) Diagram S shows a group of muscle cells.

i) What are the darkly staining areas labelled A?

_____ (1 mark)

ii) What is their function within the cell?

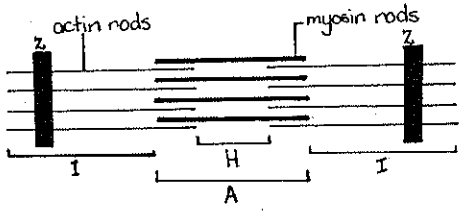
_____

_____ (1 mark)

c) Fig. 14 shows a diagrammatic representation of the relationships of the actin and myosin myofilaments within the myofibril of a relaxed muscle cell.

In the space below draw a diagram of the same area of muscle after contraction. Use the same scale as that used in Fig. 14.

Fig. 14



(2 marks)

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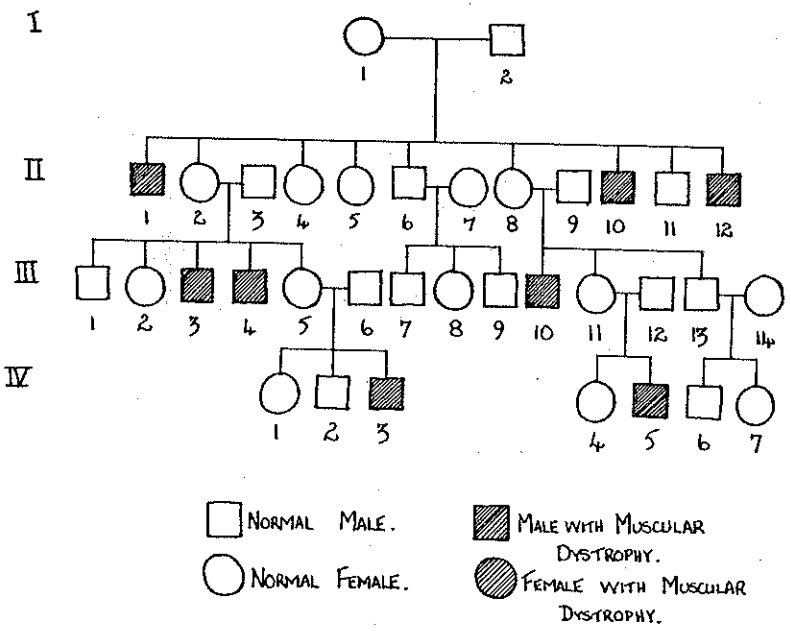
63. (continued)

d) Mitochondria are abundant in skeletal muscle cells. Explain their function in relation to muscle contraction.

(3 marks)

Fig. 15 Pedigree of Duchenne Muscular Dystrophy



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63. (continued)

e) Is the most likely mode of inheritance of Duchenne muscular dystrophy shown in the pedigree in Fig. 15 dominant or recessive?

Give one conclusive reason for your choice.

(1 mark)

Is the most likely mode of inheritance autosomal or X linked?

Give one reason for your choice.

(1 mark)

f) What are the genotypes of the following individuals?

II.1

III.1

III.11 (3 marks)

Indicate in the space below the meaning of the symbols you are using.

g) III.11 is pregnant. What is the probability that she is carrying another son with muscular dystrophy? (show working)

(2 marks)

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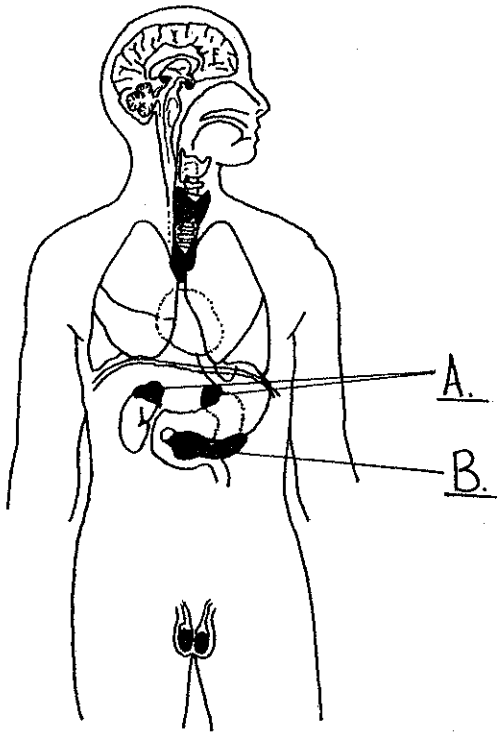
64. Fig. 16 Location of endocrine glands and associated structures



a) Figure 16 shows the position of several endocrine glands in the body. Name the glands labelled A and B and give one hormone produced by each.

Gland A _____ produces hormone _____

Gland B _____ produces hormone _____

(4 marks)

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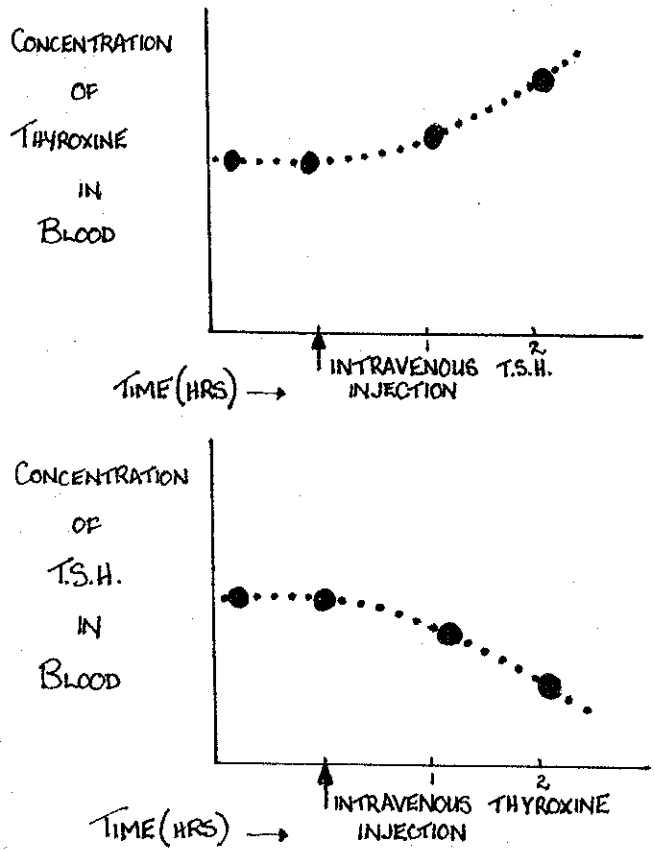
64. (continued)

Fig. 17



b) The graphs in Figure 17 show the inter-relationship between the circulating levels of thyroxine and T.S.H. (thyroid stimulating hormone).
Using this information explain how a relatively constant level of thyroxine is maintained in the blood.

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(4 marks)

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64. (continued)

c) Thyroxine contains iodine which is an essential element in the diet.

i) What symptoms are produced in an adult by an iodine deficiency in the diet?

(3 marks)

ii) Explain how an iodine deficiency in the diet will affect the concentration of T.S.H. in the blood.

(1 mark)

65. The amount of amylase enzyme present in the saliva of three groups of people living in Africa was measured. The purpose of this investigation was to test the following hypothesis:

People eating a diet containing a high proportion of carbohydrate produce more amylase than people eating a diet containing little carbohydrate.

The diets consumed by the three groups of people are described below.

The Tswana eat a diet consisting mainly of carbohydrate with a small amount of meat and milk. Ninety two people were examined.

The thirty two Europeans who were tested eat a mixed diet of meat, fish, milk products, cereals, fruit and vegetables. This diet contained a moderate amount of carbohydrate.

The Bushmen of the Kalahari Desert eat a diet consisting of birds, snakes, lizards and game. Their diet contained very little carbohydrate. The saliva of ten Bushmen was examined.

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65. (continued)

The results of this study are tabulated below.

	Amount of amylase present in units per ml of saliva
Tswana	248
Europeans	101
Bushmen	22

a) Do the results support the hypothesis being tested? If so how?

(2 marks)

b) Identify three weaknesses in the design of the experiment.

(3 marks)

c) Design an experiment that would test the given hypothesis, and overcome the weaknesses you have identified.

(3 marks)

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66.

A team of anthropologists discovered three intact fossilized jaws, each with a complete set of teeth. The size of the teeth was calculed so that comparisons could be made between the fossilized remains. Their results are tabulated below.

Cross-sectional areas of teeth (mm^2)

Tooth	Hominid 1	Hominid 2	Hominid 3
First incisor	79	78	80
Second incisor	66	44	52
Canine	98	91	86
First premolar	101	111	185
Second premolar	95	117	212
First molar	150	173	269
Second molar	147	213	361
Third molar	116	206	335

a) Why is it that teeth are the most commonly found fossilized remains of hominids?

(2 marks)

b) Additional evidence found by the anthropologists clearly indicated that hominid 1 was a hunter-gatherer who used fire. Comment on the likely diet of hominid 3. Explain which evidence led you to your conclusion.

(3 marks)

c) The body weights of hominids 2 and 3 were estimated to be 25kg and 50kg respectively. Could hominid 2 be the female and hominid 3 the male of the same species? Explain your reasons clearly.

(3 marks)

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PART II

Essay Section.

THIS SECTION IS DIVIDED INTO TWO (2) SUB-SECTIONS. ATTEMPT ONE (1) QUESTION FROM EACH SUB-SECTION. ILLUSTRATE YOUR ANSWERS WITH DIAGRAMS, WHERE APPROPRIATE. DO NOT WRITE YOUR ANSWER IN PENCIL.

SUB-SECTION I

67. The importance of good nutrition begins at conception and continues throughout the life cycle.

a) Briefly outline the pathway by which nutrients are supplied from the mother to the developing unborn child.

(4 marks)

b) Compare and contrast the nutritional requirements of a pregnant and a non-pregnant woman.

(8 marks)

c) In some developing countries, there has been a trend to bottle feed babies rather than to breast feed them, because advertisements for commercial "formula" milk have led mothers to believe that bottle feeding is better. Imagine that you are part of a medical team to visit one of these countries. Explain 4 points that you would make to convince these mothers that breast feeding is more advantageous than bottle feeding. Your answer should relate specifically to conditions in developing countries.

(8 marks)

68. a) Relate the structure of the intestinal villi to their function of absorbing the products of digestion. Describe the processes and paths by which the different products of digestion are absorbed into the circulatory systems of the body.

(13 marks)

b) The blood circulatory system carries products of digestion from the alimentary canal to the liver. What metabolic processes are performed by the liver on the products of digestion?

(5 marks)

c) Explain the advantages of transporting the products of digestion to the liver before transporting them to other organs such as the kidney.

(2 marks)

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69. a) Describe the mechanisms by which air is drawn into and pumped out of the lungs during normal breathing. Explain how the structure of the alveolus is adapted for efficient gas exchange between the air and the blood.

(11 marks)

b) During a period of exercise the rate and depth of breathing increases. Explain fully the relationships between exercise, the rate of cellular respiration, and the rate and depth of breathing.

(6 marks)

c) What effect would hyperventilation (a period of rapid deep breathing) have on the length of time a person could hold his/her breath? Explain fully.

(3 marks)

SUB-SECTION II

70. A consequence of natural selection is that over many generations species become well adapted to the particular environments they inhabit. These adaptations may be structural, physiological and/or behavioural. Comparative studies of the Primates have highlighted their adaptations for locomotion and feeding.

a) Relate the structural adaptations of baboons, gibbons and humans to their respective modes of locomotion.

(9 marks)

b) Is it more likely that humans evolved from a brachiator or a quadruped? Explain,giving your reasons.

(2 marks)

c) Relate the mode of locomotion of baboons, gibbons and humans to their diets and feeding behaviours.

(9 marks)

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71. Cardiovascular disease accounts for approximately 50% of deaths in Australia.

a) Discuss the most common types of cardiovascular disease. Include in your answer the structural changes which take place in blood vessels and the ways in which cardiovascular disease most often leads to death.

(9 marks)

b) An understanding of the associated risk factors can help an individual to modify his/her life style to minimize the risk of cardiovascular disease.
Outline four important risk factors (apart from age and genetic factors) and explain how each affects the cardiovascular system.

(8 marks)

c) Suggest three ways in which government policy could help to reduce risk factors for cardiovascular disease in the community.

(3 marks)

72. a) Briefly outline the structural and functional features of the male and female reproductive systems which facilitate the transport of gametes to the point of fertilization.

(6 marks)

b) Couples who have been unable to produce children can sometimes be assisted by the techniques of 'artificial insemination' and 'in vitro fertilization'. Distinguish between these techniques and explain the need for each in terms of specific problems of infertility.

(8 marks)

c) Sperm banks have been established to provide sperm for both 'artificial insemination' and 'in vitro fertilization'.

i) What type of data do you think should be kept on record at a sperm bank about the donor and why?

(3 marks)

ii) What legal problems could arise from use of donor sperm in artificial insemination?

(3 marks)

END OF PAPER