TERTIARY ENTRANCE EXAMINATION, 1991

QUESTION/ANSWER BOOKLET

HUMAN BIOLOGY

Please place one of your student identification labels in this box

SEA 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 3-19
PART II	Pages 20-38
PART III	Pages 39-42
Space for rough work	Page 43

Separate Multiple Choice Answer Sheet
Standard Answer Book
Paper Binder

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

IMPORTANT NOTE TO CANDIDATES

No other items may be taken into the examination room.

It is your responsibility to ensure that you do not have any unauthorised notes or other items of a non-personal nature in the examination room. Please check carefully, and if you have any unauthorised material with you, hand it to the supervisor BEFORE reading any further.

SEE 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 41-50 80 marks
This part consists of ten (10) 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.
DO NOT WRITE ANY ANSWERS TO PART II QUESTIONS IN THE STANDARD ANSWER BOOK.

PART III Questions 51-54 40 marks
This part consists of four (4) essay questions.
Answer ONE question from Section A and ONE question from section B.
The essays for PART III should be written in the Standard Answer Book 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 and Standard Answer Book(s).

At the end of the examination, attach the Standard Answer Book to the back of your Question/Answer Booklet with the paper binder provided.

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. "Flight-or-fight" activities are initiated by the

(a) sympathetic division of the autonomic nervous system.
(b) parasympathetic division of the autonomic nervous system.
(c) cerebral cortex.
(d) cerebellar cortex.

2. Which of the following is **INCORRECT** ?

(a) Only substances dissolved in saliva will cause a taste sensation in the mouth.
(b) Taste can be impaired when sense of smell is impaired.
(c) The tip of the tongue is most sensitive to sweet taste sensations.
(d) Chemical stimuli directly activate axons of receptor cells located in the taste buds.

3. In an experiment on mature female rats the pituitary gland was removed. Which of the following would remain **UNAFFECTED** ?

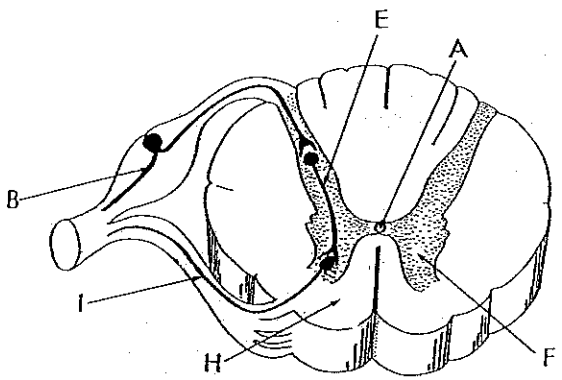
(a) Adrenalin secretion from the adrenal gland.
(b) Secretion of oestrogen from the ovary.
(c) Thyroxine secretion from the thyroid gland.
(d) Water retention by the kidney.

4. Nerve endings for the detection of sound are located in the

(a) semicircular canals.
(b) cochlea.
(c) Eustachian tube.
(d) ossicles.

SEE NEXT PAGE

Questions 5, 6 and 7 refer to the diagram below showing some components of a reflex arc.



5. Which of the following is **CORRECT** ?

(a) H is gray matter which contains nerve cell bodies.
F is white matter which contains myelinated fibres.

(b) H is gray matter which contains myelinated fibres.
F is white matter which contains nerve cell bodies.

(c) H is white matter which contains myelinated fibres.
F is gray matter which contains nerve cell bodies.

(d) H is white matter which contains nerve cell bodies.
F is gray matter which contains myelinated fibres.

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Questions 6 and 7 refer to the diagram on page 4.

6. Structure **A**

(a) contains blood vessels.
(b) contains nerves.
(c) contains fluid.
(d) makes the spinal cord flexible.

7. The **CORRECT** sequence of structures involved in transmitting impulses as part of a simple reflex arc is

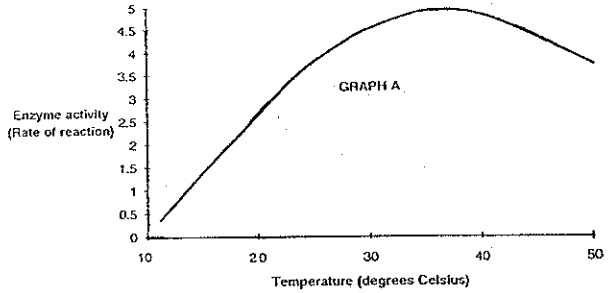
(a) B (sensory neuron), E (interneuron), I (motor neuron).
(b) B (motor neuron), E (interneuron), I (sensory neuron).
(c) I (sensory neuron), E (interneuron), B (motor neuron).
(d) I (motor neuron), E (interneuron), B (sensory neuron).

8. Substantial injury to the right cerebral cortex results in loss of

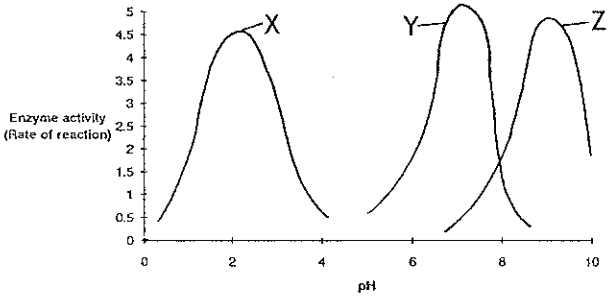
(a) voluntary muscular movements of the left side of the body.
(b) voluntary muscular movements of the right side of the body.
(c) involuntary muscular movements of the left side of the body.
(d) involuntary muscular movements of the right side of the body.

SEE NEXT PAGE

Question 9 refers to graphs **A and B** depicting the effects of temperature and pH of body fluids on human enzyme activity in body fluids.



GRAPH B



A student made 4 suggestions which could account for the data in the graphs.

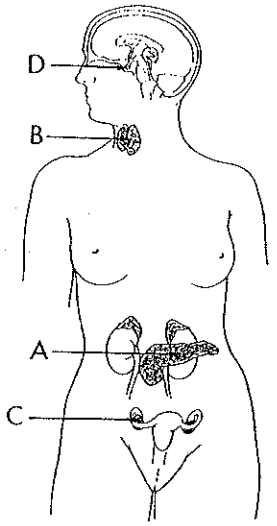
(i) The curves X,Y and Z in graph **B** represent different enzymes each having a peak activity within a narrow pH range.
(ii) The curves X,Y and Z in graph **B** represent the same enzyme which has peak activities at pH 2, pH 7 and pH 9.
(iii) pH of body fluids varies considerably.
(iv) Enzyme activity increases with increasing temperature.

9. Which of the student's suggestions are consistent with the data in the graphs ?

(a) (i) and (iii).
(b) (i) and (iv).
(c) (ii) and (iii).
(d) (ii) and (iv).

SEE NEXT PAGE

Question 10 refers to the location of some of the endocrine glands (labelled **A** to **D**) in a human female illustrated below.



10. Which of the following is **CORRECT** ?

(a) **A** is the ovary, **B** is the pituitary, **C** is the thyroid and **D** is the parathyroid.
(b) **A** is the thyroid, **B** is the ovary, **C** is the pituitary and **D** is the pancreas.
(c) **A** is the pancreas, **B** is the thyroid, **C** is the ovary and **D** is the pituitary.
(d) **A** is the pancreas, **B** is the pituitary, **C** is the ovary and **D** is the parathyroid.

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11. Which of the following separate the middle ear from the inner ear ?

(a) The oval window and the round window.
(b) The oval window and the tympanic membrane.
(c) The oval window, the round window and the tympanic membrane.
(d) The oval window, the round window and the organ of Corti.

12. Which of the following responses occur when there is a fall in body temperature ?

(i) Shivering.
(ii) Vasoconstriction in skin.
(iii) Decreased breathing rate.
(iv) Increased depth of breathing.

(a) (i) only.
(b) (i),(ii) only
(c) (i),(ii),(iii) only.
(d) (i),(ii),(iii) and (iv).

13. Insulin and glucagon

(a) produce effects that are additive or complementary.
(b) act in opposition on adipose tissue.
(c) secretion can be influenced by the pituitary gland.
(d) are only involved in the regulation of blood glucose.

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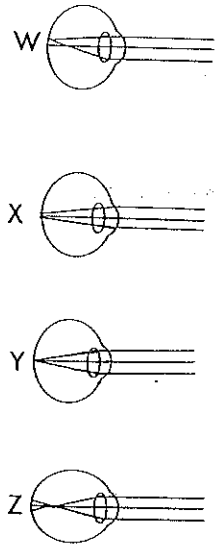
Question 14 refers to the diagrams **W, X, Y and Z** below showing light rays entering human eyes.



14. Which of the following is **CORRECT** ?

(a) **W** is myopia (short-sightedness).
X is hypermetropia (long-sightedness).
Y is astigmatism.
Z is normal.

(b) **W** is astigmatism.
X is myopia (short-sightedness).
Y is normal.
Z is hypermetropia (long-sightedness).

(c) **W** is astigmatism.
X is hypermetropia (long-sightedness).
Y is normal.
Z is myopia (short-sightedness).

(d) **W** is myopia (short-sightedness).
X is astigmatism.
Y is hypermetropia (long-sightedness).
Z is normal.

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15. Spectacles with concave lenses help to correct

(a) myopia (short-sightedness).
(b) hypermetropia (long-sightedness).
(c) astigmatism.
(d) hypermetropia (long-sightedness) and astigmatism.

16. The rhythmic control of breathing is produced by the activity of inspiratory and expiratory neurons located in the

(a) medulla.
(b) pons.
(c) midbrain.
(d) hypothalamus.

17. The activity of inspiratory and expiratory neurons is influenced by

(a) changes to the concentration of carbon dioxide in the blood.
(b) the degree of stretch in intercostal muscles.
(c) the degree of stretch in muscles of the diaphragm.
(d) all of the above.

18. Members of a racial group are **MOST LIKELY** to

(a) have a similar culture.
(b) have the same skin colour.
(c) have a high proportion of genes in common.
(d) live in the same geographical area.

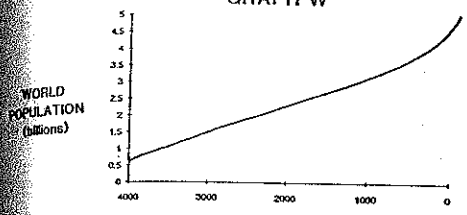
19. In which of the following cases would a person **NOT** develop active immunity to a communicable disease ?

(a) Contracting the disease and then recovering from it.
(b) Receiving an injection containing dead disease-causing bacteria.
(c) Receiving an injection of a disease-causing virus that had been weakened by heat treatment.
(d) Consumption of breast milk from a mother who had suffered from the disease.

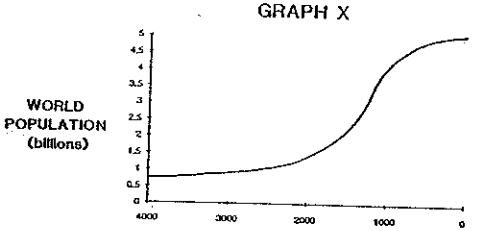
SEE NEXT PAGE

Question 20 refers to the graphs **W, X, Y and Z** below.

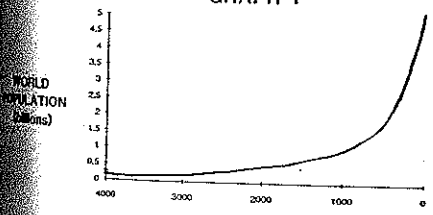
GRAPH W



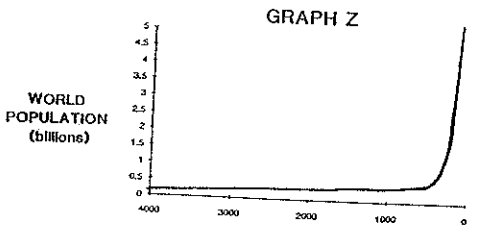
GRAPH X



GRAPH Y



GRAPH Z



20. Which of the graphs above **MOST CORRECTLY** illustrates change in world population ?

(a) W.
(b) X.
(c) Y.
(d) Z.

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21. Which of the following is the best definition of an antibody ?

(a) A specialised substance that can neutralise a specific foreign substance.
(b) Any substance which, when introduced to the body, causes an immune response.
(c) A substance in the blood that is able to combine with a specific foreign substance.
(d) A substance, produced by the body, that speeds up chemical reactions.

22. In June, 1988, the population of a country was 20 million. During 1988 one hundred thousand of the population died. The death rate for 1988 would have been

(a) 0.05 per thousand.
(b) 0.5 per thousand.
(c) 5 per thousand.
(d) 10 per thousand.

23. In 1929 the proportion of the Australian population aged 65 or older was less than 5%. In 1987 the proportion of people aged 65 or older was about 10.9%. The **MOST LIKELY** reason for the increase is that

(a) heart disease and cancer were not as prevalent 60 years ago.
(b) provision of pensions and superannuation has resulted in improved living conditions for elderly people.
(c) medical advances have almost eliminated diseases associated with old age.
(d) improved medical treatment has increased life expectancy.

24. Which of the following is the **CORRECT** comparison ?

	HIGH BIRTH RATE	HIGH DEATH RATE	LOW BIRTH RATE	LOW DEATH RATE
(a)	Australia	India	China	Japan
(b)	India	India	Australia	Australia
(c)	Japan	China	China	Australia
(d)	China	China	Japan	India

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25. To test the effectiveness of a new drug designed to treat bone cancer, a researcher selected 47 bone cancer patients. During the three year trial period about half of the patients were to be given the new drug while the remainder were to be treated by conventional therapy. Selection of the patients for treatment with the new drug was to be at random.

In the experiment described the independent (experimental) variable is the

(a) 47 bone cancer patients.
(b) random selection of the patients for the type of treatment.
(c) type of treatment given to the patients.
(d) effect of the treatment on the bone cancer.

Question 26 refers to an experiment where the fluid intake and output of a human was measured over a period of 48 hours. The results are shown in the table below.

INTAKE
1500 mL (food) 450 mL (water from chemical reactions) 3050 mL (liquids)
OUTPUT
450 mL (alimentary canal) 600 mL (lungs) 3000 mL (kidneys) ? mL (skin)

26. Water output from the skin was not measured but it would

(a) be less than 950 mL.
(b) be more than 950 mL.
(c) be 950 mL.
(d) depend on the environmental conditions.

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27. In an experiment to determine the upper hearing threshold of a group of students, an investigator called for 30 volunteers from a secondary school to listen to sounds emitted from a signal generator. The assembled volunteers were then asked to raise their hands if they heard a noise coming from the signal generator. The design of this experiment could be improved by

(a) testing each student individually.
(b) controlling for sex and age.
(c) testing a larger number of students.
(d) all of the above.

28. The gases that contribute most to the greenhouse effect are

(a) carbon dioxide and methane.
(b) carbon monoxide and sulfur dioxide.
(c) chlorofluorocarbons.
(d) oxides of nitrogen.

29. Which of the following is a list of renewable resources ?

(a) Solar energy, aluminium, timber, wind energy.
(b) Nuclear energy, solar energy, aluminium, timber.
(c) Fossil fuel, nuclear energy, solar energy.
(d) Solar energy, wind energy, timber.

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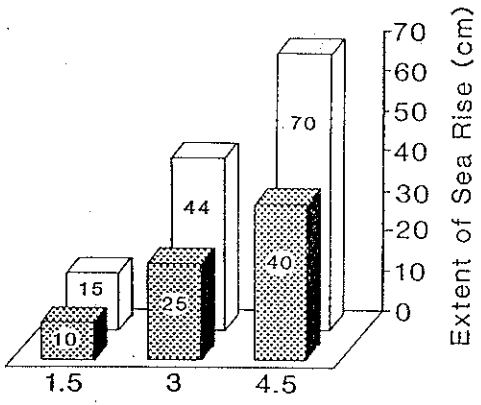
Question 30 refers to the graph below showing predicted rises in sea level by the year 2050, for three different rises in temperature of the earth's atmosphere.



30. From the graph it can be deduced that

(a) an atmospheric temperature rise of 3^0C would cause a rise in sea level of 25 centimetres.
(b) for an increase in atmospheric temperature of 4.5^0C, about 60% of the sea level rise would be caused by melting ice.
(c) melting ice is likely to be more important than thermal expansion as a contributory factor to any possible sea level rise.
(d) if the atmospheric temperature were to rise by 1.5^0C, about 66% of any sea level rise would be due to thermal expansion.

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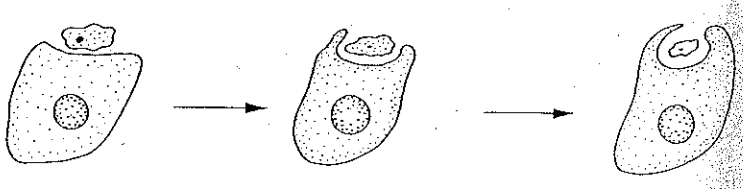
31. Which of the following organs in LIST 1 **CORRECTLY** matches a mode of defence against infection given in LIST 2 ?

LIST 1	LIST 2
A. Rectum	**W.** Mucus layer traps microorganisms
B. Trachea	**X.** Impervious barrier to microorganisms
C. Stomach	**Y.** Hairs and mucus trap microorganisms
D. Eye	**Z.** Acidic juices kill microorganisms

(a) **A** and **X**.
(b) **B** and **Y**.
(c) **C** and **Z**.
(d) **D** and **W**.

Question 32 refers to the diagrams below illustrating a cellular process.



32. The process shown is called

(a) osmosis.
(b) exocytosis.
(c) pinocytosis.
(d) phagocytosis.

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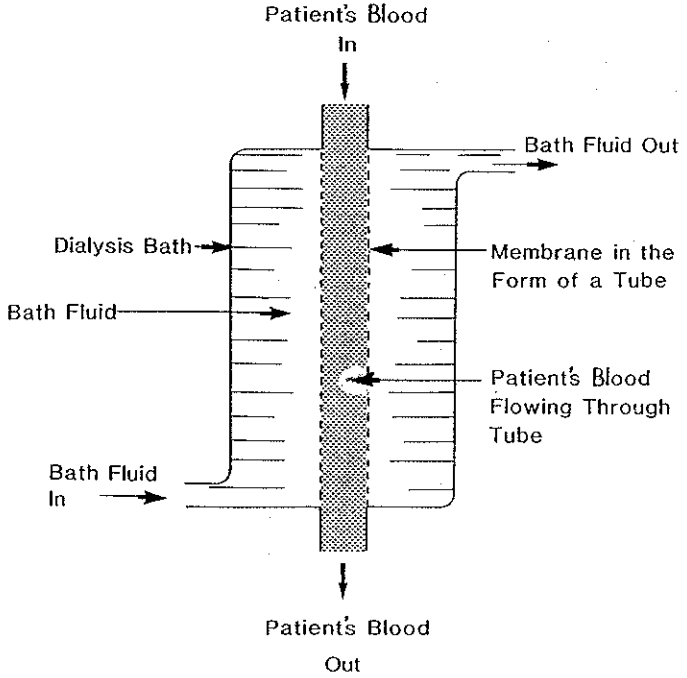
Question 33 refers to the information and diagram below.

Persons suffering from kidney failure may have to spend some time each week connected to a kidney (dialysis) machine. The diagram below is a simplified representation of part of such a machine.



33. The membrane through which the patient's blood passes would have to be

(a) permeable.
(b) impermeable.
(c) capable of active transport.
(d) differentially (semi) permeable.

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34. Which of the following hominids had the widest geographical distribution and survived for the longest period of time ?

(a) *Homo sapiens neanderthalensis.*
(b) *Homo erectus.*
(c) *Homo habilis.*
(d) The Australopithecines.

35. The first hominid to use fire was

(a) *Homo sapiens neanderthalensis.*
(b) *Homo sapiens sapiens.*
(c) *Homo erectus.*
(d) an Australopithecine.

36. When trying to determine if a fossil skull was a pongid or a hominid a palaeontologist would be most interested in

(a) the size of its brow ridges.
(b) the size of its mandible.
(c) where the skull was found.
(d) the shape of the dental arch.

37. The half-life of carbon-14 is 5730 years. When an organism dies the time taken for 75% of its carbon-14 to disappear

(a) is 11 460 years.
(b) is 8595 years.
(c) is 4297.5 years.
(d) depends on the initial quantity of carbon-14 present.

38. Evolution can occur due to

(a) natural selection only.
(b) natural selection and random genetic drift only.
(c) natural selection and migration only.
(d) natural selection, random genetic drift and migration.

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39. Red-green colourblindness is inherited as a recessive X-linked disorder. This means that

(a) women never suffer from red-green colourblindness.
(b) men can be carriers of red-green colourblindness.
(c) unaffected women can have sons with red-green colourblindness.
(d) fathers cannot pass on the gene for red-green colourblindness to their daughters.

40. The word "allele" means

(a) an incompletely dominant gene.
(b) autosomal mode of inheritance.
(c) a codominant gene.
(d) an alternative form of a gene.

END OF PART I

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PART II

ANSWER ALL QUESTIONS IN THE SPACES PROVIDED WITH EACH QUESTION. DO NOT ANSWER ANY QUESTIONS FROM THIS SECTION IN THE ANSWER BOOKLET INTENDED FOR YOUR ESSAY ANSWERS.

QUESTION 41.

(a) Identify **ONE** feature of the human pelvis, **ONE** feature of the human femur and **ONE** feature of the human foot that assists humans to walk bipedally. Fully explain how **EACH** of the **THREE** features you identify assists bipedal locomotion.

(i) The human pelvis (2 marks):

(ii) The human femur (2 marks):

(iii) The human foot (2 marks):

(6 marks)

SEE NEXT PAGE

41. (continued)

(b) The oldest known fossil hominid skeletons that show clear evidence of bipedal locomotion are about 3.5 million years old. Describe **TWO** conditions that improve the process of fossilisation and explain how these conditions promote fossilisation.

(4 marks)

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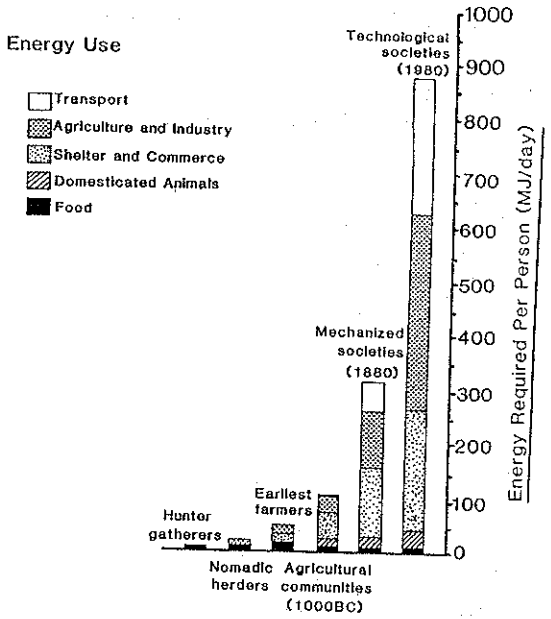
QUESTION 42

The graph below shows the approximate quantities of energy used per person per day by different human ways of life.



Human Ways of Life

(a) What was the approximate amount of energy required, per person per day, for transport in

1880 ?

1980 ?

(2 marks)

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42. (continued)

(b) Give **TWO** reasons to account for any difference between your answers to (a) and (b) above.

(2 marks)

(c) What is the main source of energy for transport, agriculture and industry, and shelter and commerce in 1991 ?

(1 mark)

(d) Is it likely that human societies will be able to rely on that main source of energy {mentioned in (c) above} indefinitely ? Explain your answer.

(2 marks)

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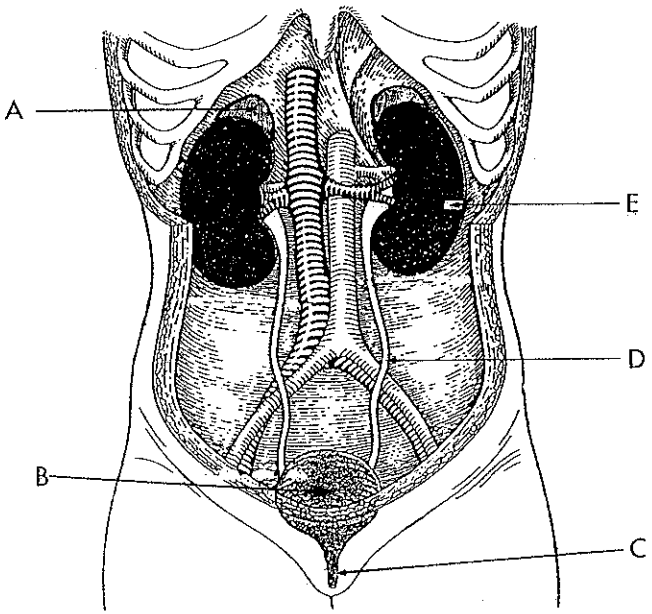
QUESTION 43 on the next page (page 25) refers to the diagram below.



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QUESTION 43

In the table below name the structures labelled **A** to **E** on the diagram on the opposite page (page 24) **AND** state the function of each.

STRUCTURE	NAME	FUNCTION
A		
B		
C		
D		
E		

(10 marks)

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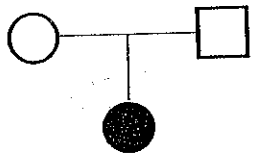
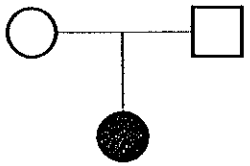
QUESTION 44

Genetic counsellors were studying a human pedigree to determine whether a disorder was inherited in an autosomal recessive or in an X-linked recessive fashion. When they came across the pattern illustrated directly below, within the pedigree, they knew at once that this disorder was inherited as an autosomal recessive trait.



(a) Indicate the genotypes of **EACH** parent **AND** their offspring **on the pedigree pattern illustrated below** to show how this trait is inherited in an autosomal recessive fashion. Clearly indicate the meaning of any letter/s you use.



(3 marks)

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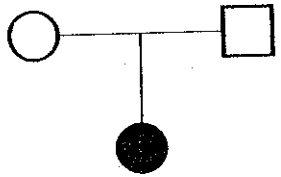
44. (continued)

(b) On the pedigree illustrated directly below use letters to show how sex is inherited in humans. Clearly indicate the meaning of the letter/s used.



(3 marks)

(c) Use your answer to (b) above to explain why the pedigree pattern illustrated shows the inheritance of an autosomal recessive trait and **CANNOT** show the inheritance of an X-linked recessive trait.

(3 marks)

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QUESTION 45.

A study of the world distribution of ABO blood groups showed that there were large variations in blood group frequencies in different parts of the world. It is likely that some of these differences in frequency could be due to natural selection.

(a) Name **ONE** factor, other than natural selection, which could account for differences in ABO blood group frequencies between human populations.

(1 mark)

(b) Stomach ulcers are more common among persons of type O blood group, while cancer of the stomach and pernicious anaemia are more likely among persons of type A group. These disorders commonly occur in middle age or later. Explain why these diseases are unlikely to account for the variations in ABO blood group frequencies in different parts of the world.

(2 marks)

The frequencies of genes may differ between populations because of natural selection in populations isolated from one another.

(c) What factor tends to isolate the Australian and Melanesian geographical races ?

(1 mark)

SEE NEXT PAGE

45. (continued)

(d) What factor tends to isolate the African and European geographical races ?

(1 mark)

(e) What is an adaptation ?

(2 marks)

(f) List **THREE** physical characteristics of Australian Aborigines that could be considered to be adaptations to a desert habitat.

(3 marks)

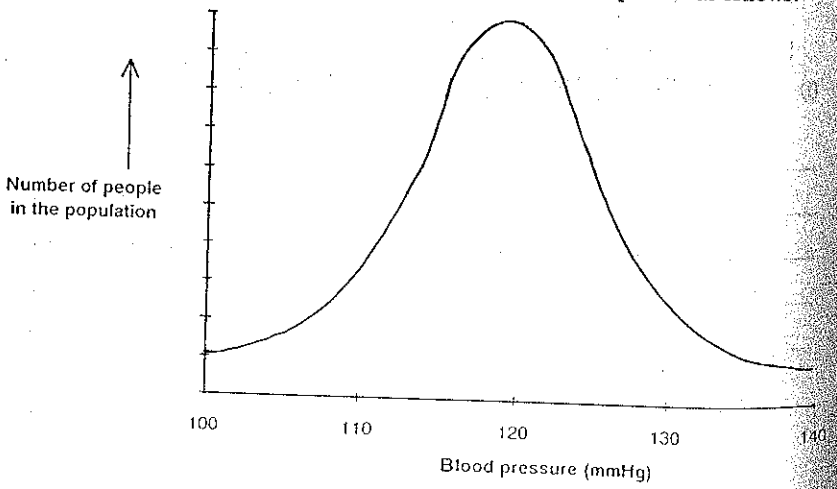
SEE NEXT PAGE

QUESTION 46.

Many human characteristics are inherited in a polygenic fashion. For example, one type of high blood pressure is caused by the inheritance of two genes which can be called P and Q. If the alternative forms of P and Q are p and q, then nine different genotypes are possible. The following table shows these genotypes and the average adult blood pressure associated with each genotype.

GENOTYPE	ADULT BLOOD PRESSURE (mmHg)
ppqq	100
ppQq	110
Ppqq	110
PPqq	120
PpQq	120
ppQQ	120
PPQq	130
PpQQ	130
PPQQ	140

The distribution of blood pressure in a population can be plotted as follows:



SEE NEXT PAGE

46. (continued)

(a) Which blood pressure genotype/s are the most common in the population represented in the graph on the previous page (page 30) ? Explain your reasoning.

(4 marks)

(b) Environmental factors can influence the way in which genes are expressed. In the table below identify **TWO** inherited human characteristics that can be modified by environmental influence. For **EACH** characteristic indicate **ONE** environmental factor that influences the characteristic.

HUMAN CHARACTERISTIC	ENVIRONMENTAL FACTOR

(4 marks)

SEE NEXT PAGE

QUESTION 47

A person was injected on **TWO** separate occasions with a disease-causing antigen.

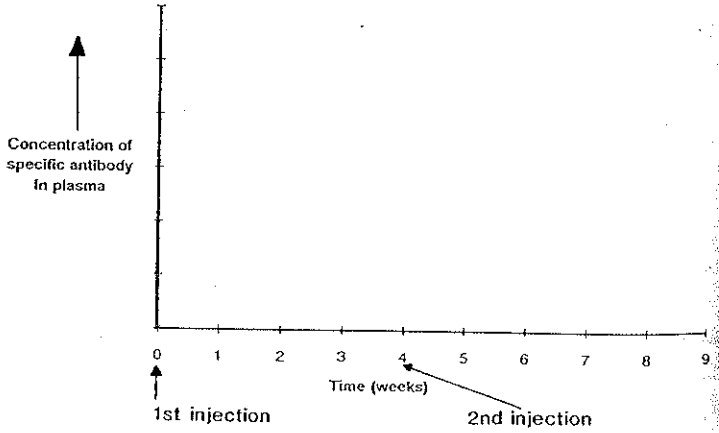
The **FIRST** injection was administered on Day 0 and within two weeks symptoms of the disease occurred but subsided by the end of the fourth week. During these four weeks the person's blood was tested at 2 day intervals for antibodies *specific to this antigen*.

The **SECOND** injection of the same antigen was given at the end of the fourth week and for a further 5 weeks the concentration of antibody *specific to this antigen* was measured in the person's blood.

(a) Explain the meaning of the phrase "*specific to this antigen*".

(1 mark)

(b) Using the axes below sketch a curve **(USE PENCIL)** showing the relationship between time and the concentration of the specific antibody following the **FIRST** injection of antigen on Day 0 until the end of the fourth week **AND**, following the **SECOND** injection of antigen until the end of the ninth week.



(4 marks)

SEE NEXT PAGE

47. (continued)

(c) In the situation described above, an antigen was injected into the subject's body causing a change in the concentration of the specific antibody. Could such a change in antibody concentration occur naturally, without any deliberate injection of antigen ? If so, explain how. If not, explain why.

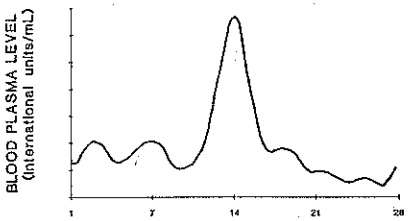
(2 marks)

SEE NEXT PAGE

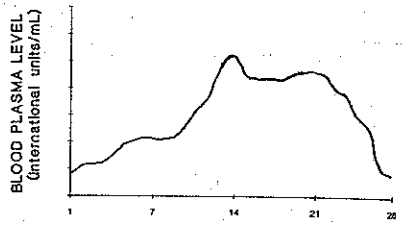
QUESTION 48

The graphs below show blood plasma levels of **FOUR** hormones **(A,B,C and D)** sampled over 28 consecutive days from an adult human female. Day 1 is the beginning of menstrual bleeding. These hormones are involved in the regulation of the ovarian and menstrual cycles in the human female.

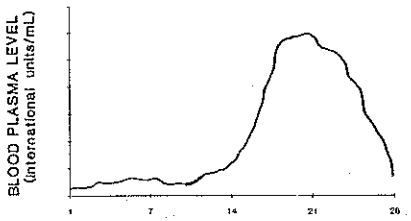
HORMONE A



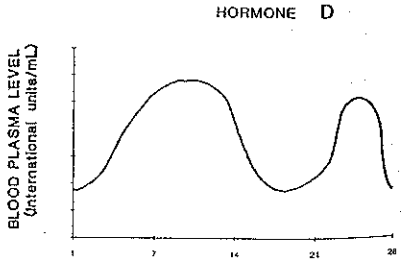
HORMONE B



HORMONE C



HORMONE D



SEE NEXT PAGE

48 (Continued)

(a) Name the organs that secrete **EACH** of the hormones:

A _____

B _____

C _____

(3 marks)

(b) Name the hormone which initiates follicle development.

_____

(1 mark)

(c) Name TWO hormones that are involved in the regulation of the ovarian/menstrual cycle which act on the hypothalamus in a negative feedback fashion.

_____

_____

(2 marks)

(d) How does the hypothalamus respond to this negative feedback ?

_____

_____

_____

_____

(2 marks)

SEE NEXT PAGE

QUESTION 49.

(a) State **TWO SIMILARITIES** in the effect of alcohol **AND** analgesics on the human body.

(2 marks)

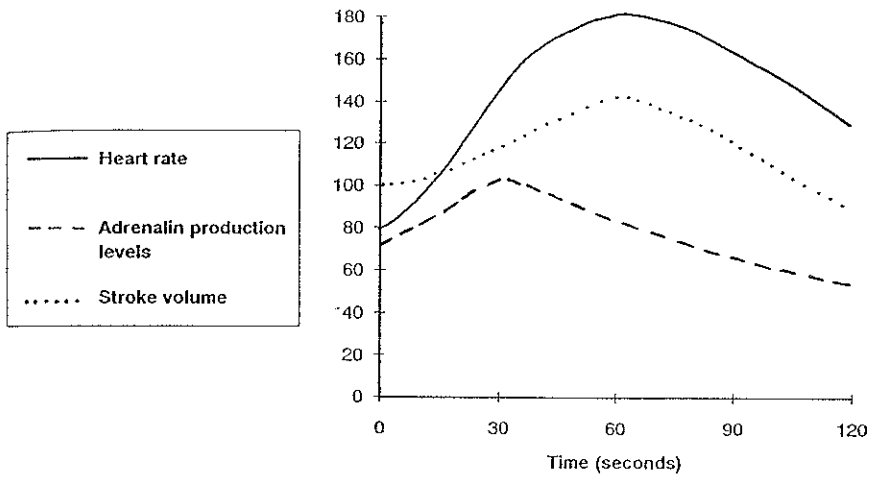
(b) State **TWO DIFFERENCES** in the effect of alcohol **AND** analgesics on the human body.

(2 marks)

SEE NEXT PAGE

QUESTION 50.

The graph below shows heart rate (beats per minute), stroke volume (mL) and adrenalin level (units/mL) measured in an individual during a race. This 800 metre race started at time 0 and was completed in 1 minute 45 seconds.



(a) Calculate the **MAXIMUM CHANGE** in cardiac output in this individual during the 800 metre race. (NOTE: For maximum marks please show all your reasoning/working).

(3 marks)

SEE NEXT PAGE

50. (continued)

(b) Adrenalin increases heart rate. The levels of adrenalin indicated on the graph are higher than normal - even at the start of the race. Give **ONE** reason why adrenalin level would be higher than normal at the start of a race.

(1 mark)

(c) Adrenalin increases heart rate. What was the time delay between the maximum adrenalin level in the blood and its maximum effect on the cardiac response to this increased activity ?

(1 mark)

(d) Explain why there was a time delay between the maximum adrenalin level in the blood and its maximum effect on the cardiac response to this increased activity.

(2 marks)

END OF PART II

SEE NEXT PAGE

PART III

ANSWER ONE QUESTION FROM SECTION A AND ONE QUESTION FROM SECTION B. WRITE YOUR ANSWERS IN THE STANDARD ANSWER BOOK. ILLUSTRATE YOUR ANSWERS WITH DIAGRAMS, WHERE APPROPRIATE. UP TO TWO MARKS MAY BE DEDUCTED FOR POORLY STRUCTURED ESSAYS ie. ANSWERS IN POINT FORM OR DIAGRAMS NOT EXPLAINED IN THE TEXT OF THE ESSAY. DO NOT WRITE YOUR ANSWERS IN PENCIL.

SECTION A

(ANSWER EITHER QUESTION 51 OR QUESTION 52 - NOT BOTH)

QUESTION 51.

(a) Culture can be defined as a collection of learned behaviours. Describe **FIVE** ways in which the culture of *Homo erectus* helped this hominid to survive.

(10 marks)

(b) About 10 000 years ago *Homo sapiens* changed from a hunting and gathering existence to an agricultural existence.

Identify **TWO** factors that led to the start of the Agricultural Revolution 10 000 years ago and explain their importance to the onset of agricultural practices.

(4 marks)

(c) Describe **THREE** ways in which the culture of *Homo sapiens* developed in the 5000 years after the Agricultural Revolution.

(6 marks)

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1991

SECTION A (Continued)

QUESTION 52.

(a) Explain why **EACH** of the following developments results in deterioration of the environment:

(i) Industrialisation.
(ii) Urbanisation.
(iii) Use of chlorofluorocarbons (CFCs).

(9 marks)

(b) Discuss Australian Aborigines prior to European Settlement under the following headings:

(i) Origins.
(ii) Dispersal in Australia.
(iii) Cultural adaptations for survival in the Australian environment.

(11 marks)

SEE NEXT PAGE FOR SECTION B

SECTION B

(ANSWER EITHER QUESTION 53 OR QUESTION 54 - NOT BOTH)

QUESTION 53.

(a) The concentration of substances in body fluids (including cytoplasm, tissue fluid and blood plasma) must remain fairly constant. Explain how **EACH** of the following helps to maintain the concentration of substances in body fluids at a fairly constant level:

(i) Filtration in the kidney.
(ii) Active secretion in the kidney.
(iii) Reabsorption in the kidney.
(iv) The thirst reflex.

(12 marks)

(b) Discuss acquired immune deficiency syndrome (AIDS) under the following headings:

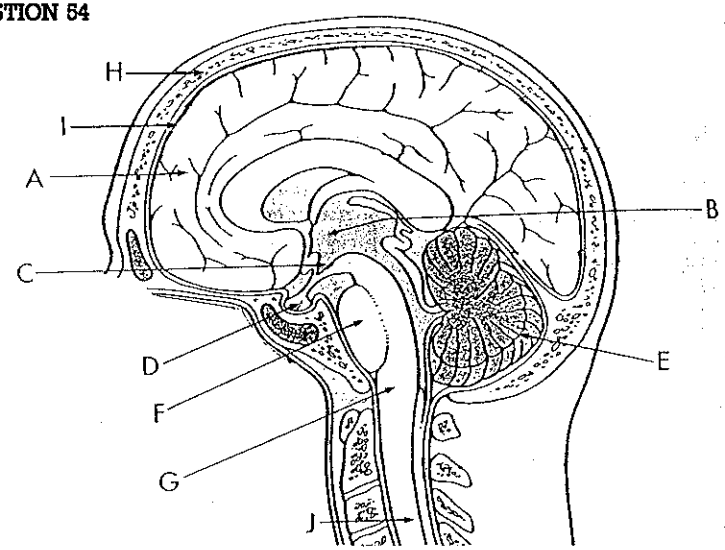
(i) Cause and symptoms of infection.
(ii) How the disease is spread from person to person.
(iii) Preventive measures.

(8 marks)

SEE NEXT PAGE

SECTION B (Continued)

QUESTION 54



MIDSAGITTAL SECTION OF THE HUMAN BRAIN

(a) Write an essay explaining the functions of each of the structures labelled A-J on the diagram above. **Your answer must include the name of each structure labelled A-J.**

(10 marks)

(b) Describe the mechanisms involved when the body responds to a demand for more energy such as an increase in physical activity.

(6 marks)

(c) Describe the mechanisms involved when physical activity ceases and there is no longer a requirement for extra energy.

(4 marks)

END OF QUESTIONS

SHEET FOR ROUGH WORK

END OF PAPER