Trinity College

SCIENCE DEPARTMENT

YEAR 11
2B HUMAN BIOLOGY EXAMINATION

Multiple Choice Question Booklet

TIME ALLOWED FOR THIS PAPER

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

SECTION 1: **Multiple Choice – 40 Questions – 40 Marks – 40%**
Answer the multiple choice questions by crossing out the letter of your choice on the answer sheet provided.
Use a 2B pencil here.

SECTION 2: **Short Answers – 10 Questions – 90 marks – 40%**
Answer the questions in the spaces provided. Answers are to be in BLUE or BLACK ink.
GRAPHS and DRAWINGS to be in pencil and labelled in ink.

SECTION 3: **Extended Answer – 2 Questions – 40 marks – 20%**
Answer question 1 **OR** question 2
AND
Answer question 3 **OR** question 4.

SECTION 1: MULTIPLE CHOICE 40 MARKS

Mark your answers to questions 1-40 on the separate multiple choice answer sheet, using a 2B pencil. If you make an error, rub out the incorrect choice and put a cross over the correct answer. Also place the new letter choice next to the question number so there is no confusion.

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1. T cells and B cells are both

   (a) Phagocytes.
   (b) Erythrocytes.
   (c) Thymocytes.
   (d) Lymphocytes.

2. Which statement about lymph nodes is correct?

   (a) They have a role in the pumping of lymphatic fluid.
   (b) They contain cells that phagocytose bacteria.
   (c) They produce antigens, vital chemicals that combat bacteria.
   (d) They contain B-lymphocytes that engulf foreign particles.

3. The antibiotic Vancomycin would be least effective at combating

   (a) A foot infection caused by a large splinter.
   (b) A sore throat caused by the Staphylococus bacterium.
   (c) The measles virus.
   (d) Severe food poisoning.

4. The human skin contains

   (a) Lysozyme, an enzyme which kills pathogenic bacteria.
   (b) Sebaceous glands that secrete cerumen, which kills pathogenic bacteria.
   (c) Sebaceous glands that secrete sebum, which has a protective function.
   (d) Hair and mucus which trap foreign particles and microorganisms.

5. Which ONE of the following statements best illustrates artificial active imunity?

   (a) Antibodies in breast milk enter the baby's bloodstream.
   (b) Antigens are made when a person suffers an attack of a disease.
   (c) Antibodies are injected into the bloodstream.
   (d) Antigens are injected into the bloodstream.

6. Which of the following statements best describes what is most likely to happen when an individual receives a vaccination containing a weakened pathogen?

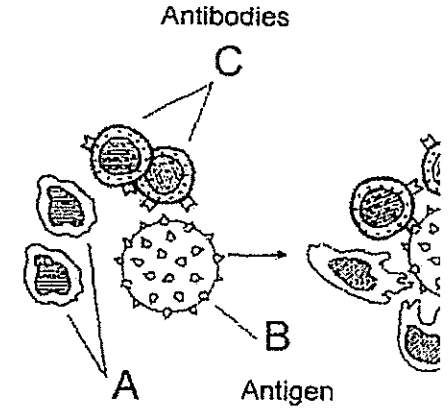
(a) The ability to fight disease will increase due to antibodies received from the pathogen.

(b) The ability to fight disease caused by the pathogen will increase due to antibody production.

(c) The ability to pr

(d) The ability to re

The next question refers to the diagram below.



7. The diagram represents one possible immune response that can occur in the human body. The structures that are part of the immune system are

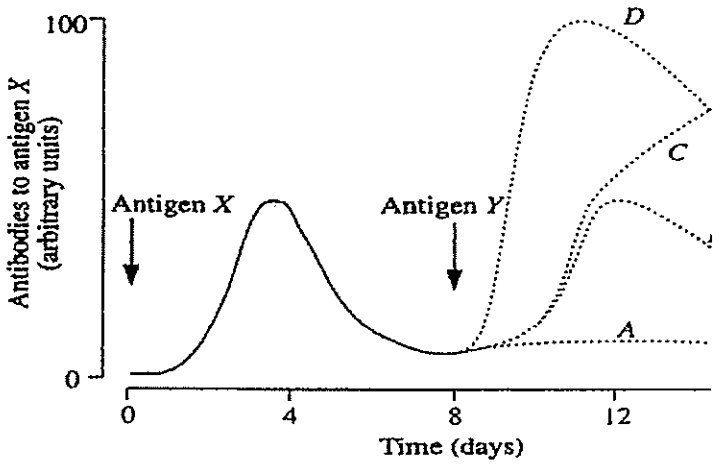
(a) A only.

(b) A and C only.

(c) B and C only.

(d) A, B and C.

8. The next question refers to the graph below



Which line best depicts the level of antibodies to antigen X from day 8 to day 16

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

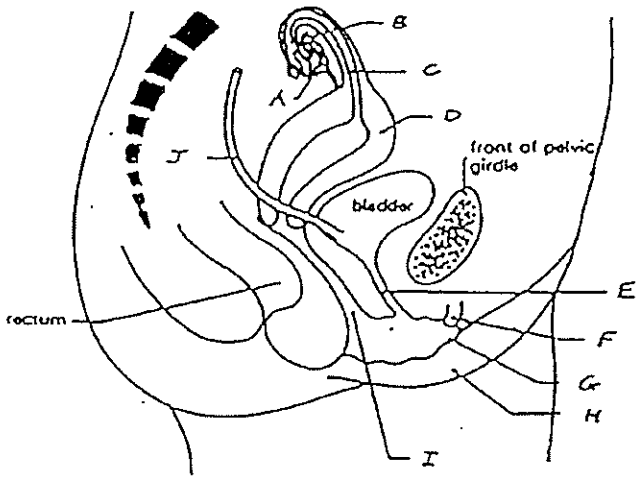
9. An obstruction in the glomerulus would block the flow of blood into the

(a) Renal artery.
(b) Efferent arteriole.
(c) Bowman's capsule.
(d) Afferent arteriole.

10. Which of the following methods of "contraception" operates largely by preventing implantation rather than by preventing fertilization?

(a) Diaphragm.
(b) Intra-uterine device.
(c) The "pill".
(d) Condom.

11. The structures in the following diagram labelled D and F are the



(a) Vagina and cervix.
(b) Fallopian tube and clitoris.
(c) Labia and urinary canal.
(d) Uterus and clitoris.

12. During the time that a foetus is developing inside the uterus

(a) It uses food that has been stored in the placenta.
(b) It is nourished via the umbilical cord.
(c) It uses food stored in a yolk.
(d) It is supplied with nutrients from the amniotic fluid.

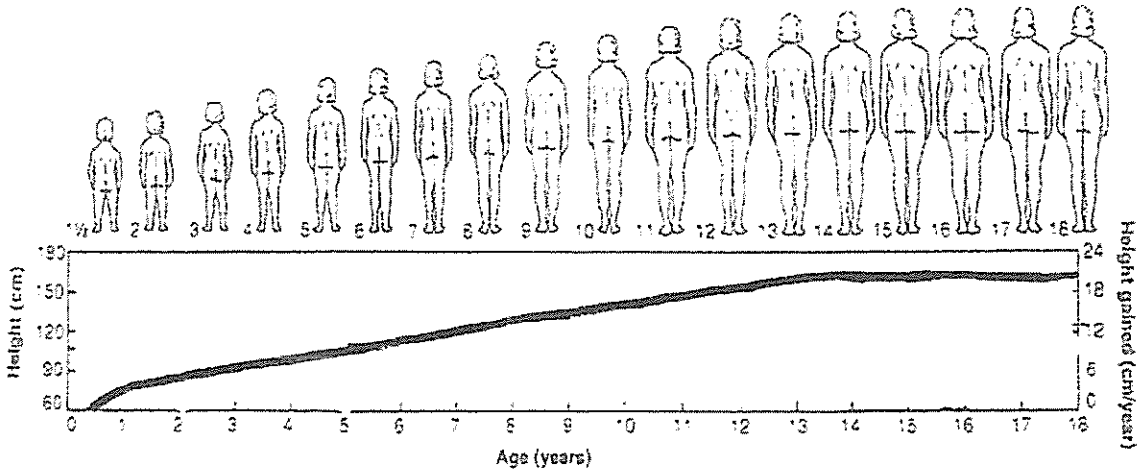
13. The foramen ovale is found

(a) In the inferior vena cave.
(b) In between the right and left atrium.
(c) In the aorta.
(d) In between the left ventricle and the left atrium.

14. The hormone responsible for the 'let down' reflex is

(a) Oxytocin.
(b) Progesterone.
(c) Prolactin.
(d) Oestrogen.

15. Using the table below, the average height gained by a female between the ages of 1 year and 2 years of age is



(a) 3 cm.
(b) 4 cm.
(c) 5 cm.
(d) 6 cm.

16. Amniotic fluid is important by serving as a medium

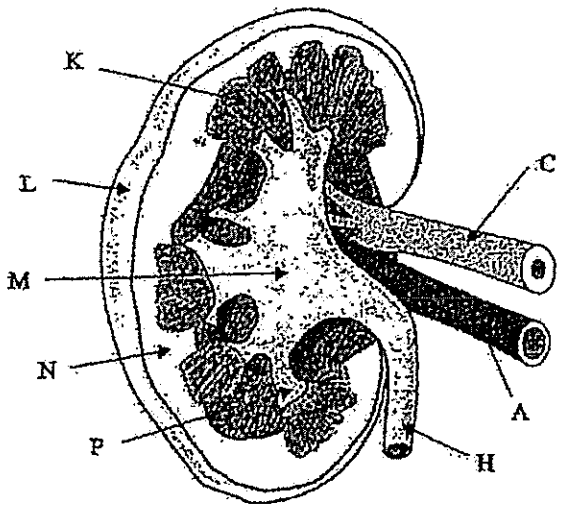
(i) For providing nutrients to the embryo.
(ii) To provide constant temperature surrounding the embryo.
(iii) To act as a shock absorber for the embryo.

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

17. The development into sexual maturity is termed

(a) Adolescence.
(b) Puberty.
(c) Growing pains.
(d) Maturity.

Question 18 refers to the following diagram



18. Which of the following statements is correct?

(a) H is the urethra, K is the renal pyramid, M is the renal pelvis, P is the minor calyx.
(b) C is the renal artery, K is the renal pyramid, L is the renal capsule, N is the cortex.
(c) A is the renal artery, H is the urethra, M is the pelvis, N is the medulla.
(d) L is the renal capsule, M is the renal pelvis, N is the medulla, P is the calyx.

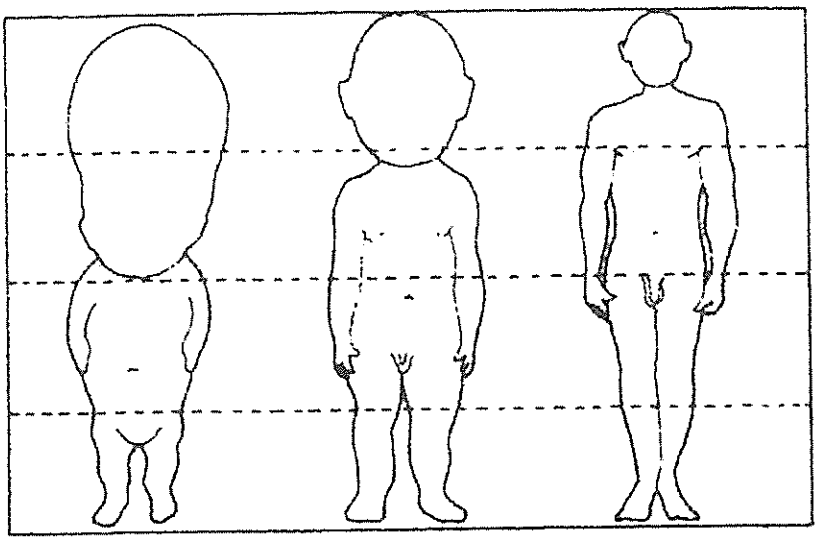
19. Urine is carried to the urinary bladder by

(a) Blood vessels.
(b) Lymphatics.
(c) The ureters.
(d) The urethra.

20. By which method are the genetic disorders Down Syndrome and Muscular Dystrophy detected?

(a) X-ray.
(b) Fetoscopy.
(c) Amniocentesis.
(d) Oogenesis.

21. The diagram below shows three stages in human development. The proportions have been made equal.



Which of the statements below is **UNTRUE**?

(a) The length of the legs increases in proportion to the body.
(b) The parts of the body develop at different rates.
(c) The head is shrinking.
(d) The arms increase in proportion to the body.

22. The following table shows deaths during infancy (first 9 months) related to types of feeding. (Statistics gathered in a third world country during the 1950's).

Food	Number of Infants	Total Deaths	Death Rate
Wholly breast fed	9000	9	0.15
Partially breast fed	3000	45	1.5%
Fed artificial formula	6000	270	4.5%

From the table above, the death rate amongst infants fed on artificial formula is

(a) 6.0 times greater than that for partially breast fed infants.
(b) 30.0 times greater than that for wholly breast fed infants.
(c) 4.0 times greater than that for partially breast fed infants.
(d) 45.0 times greater than that for wholly breast fed infants.

23. In which structure in the nephron does active reabsorption of glucose occur?

(a) Glomerular capsule.
(b) Proximal convoluted tubule.
(c) Distal convoluted tubule.
(d) Loop of Henle.

24. The cells in the kidney's collecting duct are permeable to water. An increase in this permeability is due to

(a) A decrease in the production of ADH.
(b) An increase in the production of ADH.
(c) A decrease in the concentration of the blood plasma.
(d) An increase in the production of aldosterone.

25. Rapid, repeating uterine contractions responsible for dilation of the cervix prior to birth are better known as

(a) Labour pains.
(b) Peristalsis.
(c) Braxton Hicks pains.
(d) All of the above.

26. Which of the following statements about the development of the fertilised ovum is INCORRECT?

(a) Fertilisation produces a zygote which contains 46 chromosomes.
(b) The fertilised ovum undergoes several mitotic divisions.
(c) The morula develops a cavity and becomes a blastocyst.
(d) The blastocyst implants in the endometrium 3 weeks after fertilisation.

27. The first sign of syphilis is usually

(a) a small copper coloured rash at the site of contact.
(b) benign growths occurring randomly in the body.
(c) white ulcers in the mouth.
(d) superficial sores at the site of contact.

28. Which of the following statements about pregnancy is INCORRECT?

(a) During late pregnancy women urinate more often because the expanding uterus exerts pressure on the bladder.
(b) The lungs of the foetus are collapsed until birth.
(c) The chorion is made from the mother's cells.
(d) The umbilical vein carries oxygenated blood from the placenta to the foetus.

29. The genotype of an individual

a) Is always the same as the phenotype.
b) Refers to the visible traits of the individual.
c) Refers to the composition of the genes.
d) Is indicated by the presence of either an X or Y chromosome.

30. Albinism is inherited as an automsomal recessive trait. If a person has albinism and is married to a person who is heterozygous for the trait

a) There is a 50% chance of having a child with albinism.
b) There is a 25% chance of having a child with albinism.
c) There is a 75% chance of having a child with albinism.
d) There is no chance of having a child with albinism.

31. Fertilisation in humans means

(a) release of an egg from the ovary.
(b) placing of the penis into the vagina.
(c) fusing of the sperm with an egg.
(d) discharging sperms at the cervix.

32. Which of the following does **NOT** describe a spermatozoon?

(a) A motile cell.
(b) A single cell with an ovoid-shaped head, a small middle piece and a tail.
(c) Single cell containing 46 chromosomes.
(d) Produced by the testis.

33. Individuals with blood group O

(a) Have antigens A and B on their red blood cells.
(b) Have antigen O on their red blood cells.
(c) Always have at least one parent with blood type A or B.
(d) Are denoted by the genotype *ii*.

34. Siblings in a family may show marked inherent variations in skin and eye colour because,

(a) They differ in the amount of time that they spend in the sun.
(b) These factors are determined polygenically.
(c) Dark colourisation is a dominant trait.
(d) Skin colour is related to blood group.

35. What are the possible genotypes for a female offspring of a female carrier of Haemophilia and a normal male?

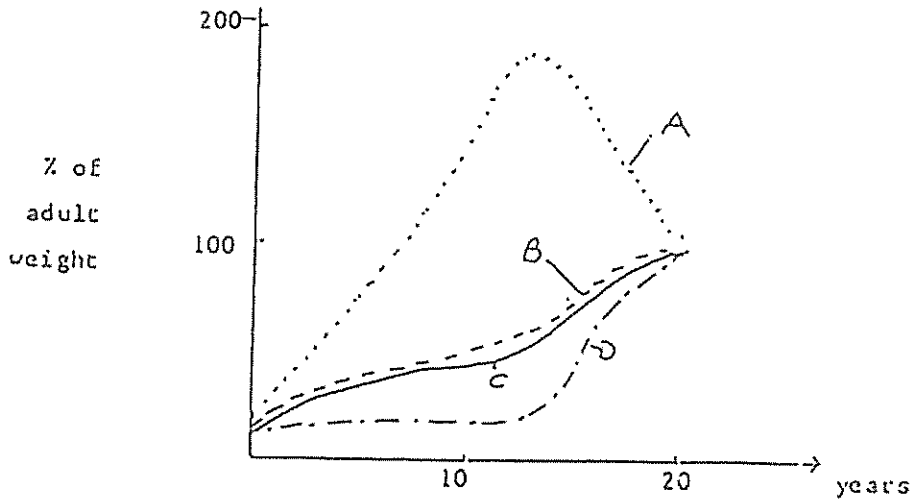
(a) X^hX^h only.
(b) X^hY only.
(c) X^HX^h or X^HX^H.
(d) X^hX^h or X^HX^H.

36. Which phase in meiosis describes the formation of daughter cells with the haploid number of chromosomes in each?

(a) Anaphase II.
(b) Prophase II.
(c) Telophase II.
(d) Telophase I.

Question 37 refers to the graph below.

Growth rates of human organ systems



37. In the graph above, line A and D represent respectively, growth of

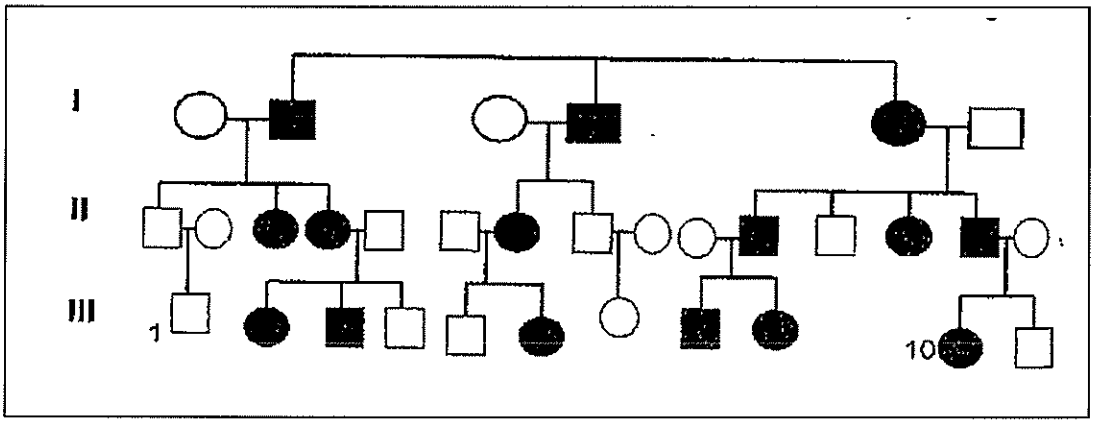
(a) the reproductive and nervous systems.
(b) the immune and nervous systems.
(c) cartilage in the skeleton and total body weight.
(d) the immune and reproductive systems.

38. The milk secreting regions of the human breast are called

(a) lobes.
(b) lobules.
(c) alveoli.
(d) areola.

Questions 39 and 40 refer to the pedigree below.

Affected individuals are indicated by shading.



39. The gene for this trait is most likely inherited as

(a) An X linked recessive because affected daughters have an affected father.

(b) An X linked dominant because affected sons have an affected mother.

(c) An autosomal recessive because more individuals aren't affected than are affected.

(d) An autosomal dominant because affected males and females have an affected parent.

40. If individual III.1 and III.10 had a child, what is the probability that the child would be affected.

(a) 0.25

(b) 0.50

(c) 0.75

(d) 1.0

END OF MULTIPLE CHOICE SECTION