IB DIPLOMA PROGRAMME
PROGRAMME DU DIPLÔME DU BI
PROGRAMA DEL DIPLOMA DEL BI

N07/4/BIOLO/SPM/ENG/TZ0/XX+

88076004

BIOLOGY
STANDARD LEVEL
PAPER 1

Friday 2 November 2007 (afternoon)

45 minutes

INSTRUCTIONS TO CANDIDATES

- Do not open this examination paper until instructed to do so.
- Answer all the questions.
- For each question, choose the answer you consider to be the best and indicate your choice on the answer sheet provided.

1. What advantages does electron microscopy have over light microscopy?

I. Excellent resolution throughout magnification range.

II. Biological material is easy to prepare and stain.

III. Movement of living cells can be seen.

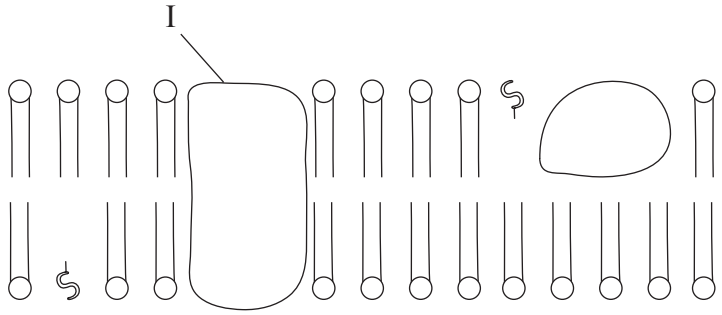
A. II and III only

B. I and II only

C. I only

D. III only

2. The diagram below shows part of a plasma membrane. What label should be used for structure I?



A. Peripheral protein

B. Phospholipid

C. Cholesterol

D. Integral protein

3. What is the product of mitosis in plant cells?

A. Four daughter cells with genetically different nuclei

B. Four daughter cells with genetically identical nuclei

C. Two daughter cells with genetically different nuclei

D. Two daughter cells with genetically identical nuclei

4. Viruses have a non-cellular structure. What components make up their structure?

A. Lipid bilayer surrounding cytoplasm

B. Lipid bilayer surrounding DNA or RNA

C. Protein coat surrounding DNA or RNA

D. Protein coat surrounding active mitochondria

5. Which substance is a base found in RNA?

A. Ribose

B. Thymine

C. Adenosine

D. Uracil

6. What type of bond holds the complementary base pairs together in a double helix of DNA?

A. Covalent bonds

B. Peptide bonds

C. Glycosidic bonds

D. Hydrogen bonds

7. During the process of translation which of the following statements describes the relationship between nucleic acids?

A. Anticodons on mRNA bind to complementary codons on DNA.

B. Anticodons on tRNA bind to complementary codons on mRNA.

C. Bases on DNA bind to complementary bases on mRNA.

D. A single strand of mRNA is produced from the DNA in the nucleus.

8. What chemical substances are used during the manufacture of organic molecules in photosynthesis?

I. Hydrogen
II. ATP
III. Carbon dioxide

A. I and III only

B. I and II only

C. II and III only

D. I, II and III

9. What is natural selection?

A. Making a random choice of partner for reproduction

B. Increased reproductive success by those with favourable variation

C. Variation due to mutations in a population

D. The survival of the largest organisms in a population

10. What is a test cross?

A. Crossing a possible heterozygote with a homozygous recessive

B. Any genetic cross to determine genotype

C. Crossing a possible homozygote with a homozygous dominant

D. Crossing a possible heterozygote with another heterozygote

11. What is the aim of the Human Genome Project?

A. Identify human infectious diseases

B. Make improvements to the human genome

C. Allow transfer of genes from other species to humans

D. Sequence genetic information in humans

12. What is the sequence of the seven levels of hierarchy of *taxa* used in classification?

A. phylum, kingdom, class, order, family, genus and species

B. kingdom, family, phylum, class, order, genus and species

C. kingdom, phylum, class, family, order, species and genus

D. kingdom, phylum, class, order, family, genus and species

13. What does a karyotype show?

A. Gel electrophoresis bands from DNA

B. The number and appearance of chromosomes

C. A pair of alleles controlling a specific character

D. All the genes possessed by a living organism

14. A diploid cell in a gorilla has 48 chromosomes. How many chromosomes will be present in a haploid gorilla cell?

A. 96

B. 48

C. 24

D. 12

15. A woman has a heterozygous genotype for blood group B. She is expecting a baby with a man who is homozygous Group A. What are the possible blood groups for their baby?

I. Group O

II. Group A

III. Group AB

A. II and III only

B. I and II only

C. I and III only

D. I, II and III

16. What enzymes are used in gene transfer techniques?

A. endonucleases and lipases

B. ligases and amylases

C. ligases and lipases

D. restriction enzymes and ligases

17. Why has evolution resulted in antibiotic resistance in bacteria?

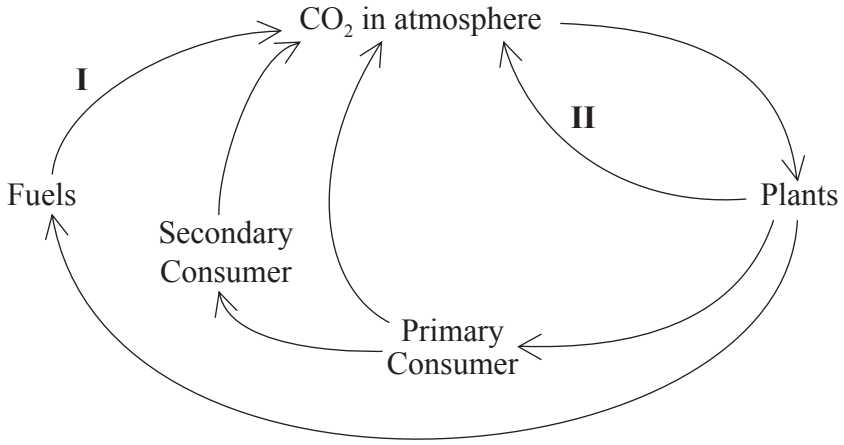
A. Not completing a course of antibiotics allows resistant bacteria to develop.

B. Bacteria resistant to the antibiotic survive to pass on this characteristic to their offspring.

C. Bacteria change their metabolism to cope with the presence of antibiotics.

D. Bacteria have learnt how to neutralize the effects of the antibiotic and they pass this onto their offspring.

18. The diagram below shows a simplified version of the carbon cycle.



What processes are involved in the transfer of carbon at stages I and II?

	I	II
A.	combustion	photosynthesis
B.	photosynthesis	respiration
C.	combustion	respiration
D.	fossilization	respiration

19. What is an ecosystem?

A. A species and its abiotic environment

B. A community and its abiotic environment

C. The habitat where a species lives

D. A population of organisms in a specific habitat

20. What name is given to an organism that is able to manufacture its own food from simple chemical materials?

A. Heterotroph

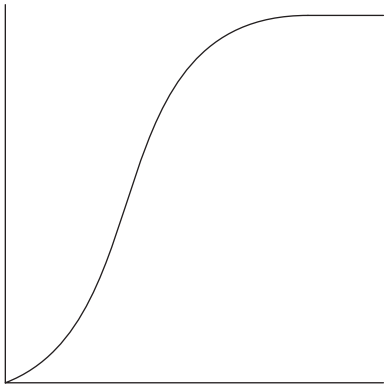
B. Saprotroph

C. Autotroph

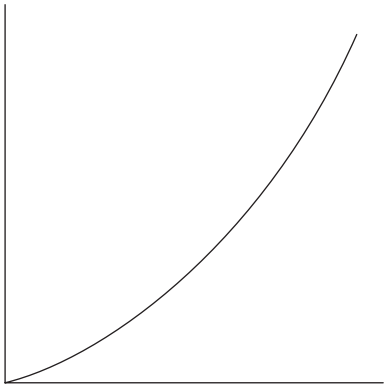
D. Detritivore

21. Which of the following graphs shows the typical growth of a population?

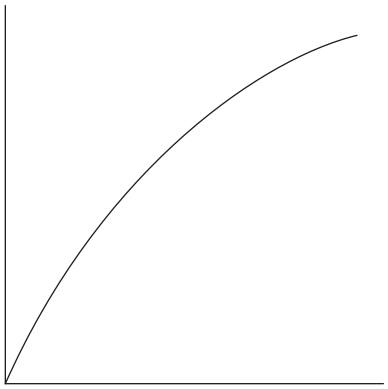
A.



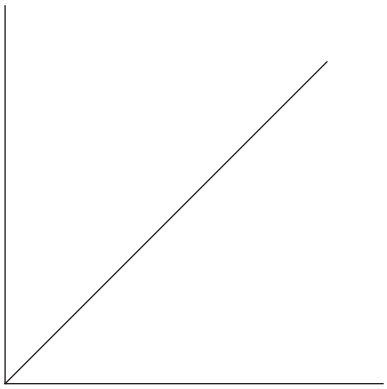
B.



C.



D.



22. What does the calculation of the Lincoln Index help biologists to determine?

A. The spread around the mean of a set of data

B. Estimation of the maximum population a habitat can support

C. The size of quadrat to be used in a distribution study

D. Estimation of the population size for an animal species

23. Why are there many different types of lymphocyte in the body?

A. Each type can recognize one specific antibody and produces a specific antigen against it.

B. Each type can recognize one specific antigen and produces a specific antibody against it.

C. Each type can recognize one antigen and engulf it by phagocytosis.

D. Each type can recognize one antibody and engulf it by phagocytosis.

24. What is absorption?

A. Food entering the mouth and being chewed

B. Food entering the stomach for digestion

C. Taking digested food into the blood stream

D. Making complex organic molecules in cells using digested foods

25. Which of the following are functions of all mammalian arteries?

I. To carry oxygenated blood

II. To carry blood away from the heart

III. To carry blood under high pressure

A. I and III only

B. I, II and III

C. II and III only

D. I and II only

26. What does the body use to control the heartbeat?

I. Adrenalin

II. Pacemaker

III. Nerves from brain

A. II and III only

B. I and II only

C. I, II and III

D. I and III only

27. How do phagocytic leucocytes help to protect against disease?

A. They secrete bacterial toxins by exocytosis.

B. They ingest pathogens by endocytosis.

C. They produce antigens to destroy pathogens.

D. They produce antibodies to destroy pathogens.

28. What defines the terms *ventilation*, *gas exchange* and *cell respiration* in mammals?

	Ventilation	**Gas exchange**	**Cell respiration**
A.	providing fresh air	replacing oxygen with carbon dioxide in blood in lungs	cellular energy production from glucose
B.	muscle movement to move fresh air into alveoli	replacing carbon dioxide with oxygen in blood in lungs	gases crossing the plasma membrane of a cell
C.	muscle movement to move fresh air into alveoli	replacing carbon dioxide with oxygen in blood in lungs	cellular energy production from glucose
D.	providing fresh air	replacing oxygen with carbon dioxide in blood in lungs	gases crossing the plasma membrane of a cell

29. How do endocrine glands function when they are involved in homeostasis?

A. They release hormones directly into the blood system.

B. They release hormones through ducts to where they are used.

C. They release digestive enzymes from the pancreas.

D. They cause positive feedback in the body's structures.

30. Which of the following outlines the roles of the two hormones oxytocin and progesterone during childbirth?

	Oxytocin	**Progesterone**
A.	causes uterine contraction	level rises allowing oxytocin production
B.	level falls allowing progesterone production	causes uterine contraction
C.	stimulates oestrogen production	level falls allowing oxytocin production
D.	causes uterine contraction	level falls causing oxytocin production