



Our country, our future

NAME:..... STREAM:.....

**SENIOR SIX**

P530/1

**BIOLOGY**

**PAPER 1**

**EXAM 3**

**FOR CONSULTATION CALL 0776802709**

**INSTRUCTIONS TO CANDIDATES:**

- *Answer all questions in both sections A and B*
- *Answers to Section A questions must be written in the boxes provided*
- *Answers to Section B should be written in spaces provided.*
- *No additional sheets of paper should be inserted in this booklet.*

**FOR EXAMINERS USE ONLY**

<b>Section</b>	<b>Marks</b>
A (1 – 40 )	
B 41	
42	
43	
44	
45	
46	
<b>Total</b>	

## SECTION A

1. Which one of the following is not a reason for classifying a mouse and a frog in one phylum?
  - A. pharyngeal gill slits
  - B. post-anal tail
  - C. notochord
  - D. endoskeleton
  
2. In photosynthesis, the major advantages of the C<sub>4</sub> pathway is to
  - A. fix carbon dioxide in the calving cycle
  - B. concentrate carbon dioxide in the cells of leaves
  - C. fix carbon dioxide in from the atmosphere into the leaves
  - D. store carbon dioxide in form of organic acids
  
3. An athletic competition organized on high lands required participants from lowlands to report three months before the competition in order to enable them.
  - A. get familiar with the place
  - B. develop strong muscles
  - C. acquire high red blood cell count
  - D. have extensive deposition of under their skins
  
4. The main distinguishing character of a eukaryotic cell is
  - A. membrane organelles
  - B. lack of nuclear membrane
  - C. presence of nucleus
  - D. presence of DNA double strands
  
5. Starch, glycogen and cellulose are all composed of
  - A.  $\alpha$  – glucose
  - B.  $\beta$  - glucose
  - C. monosaccharides
  - D. polysaccharides

6. Which of the following organelles would most be likely be abundant in the tail of a tadpole time of its reabsorption during metamorphosis?
  - A. Centrioles
  - B. Lysosomes
  - C. Golgi apparatus
  - D. Endoplasmic reticulum
  
7. If the rate of transpiration lags behind that of absorption, movement of water up to the plant main by
  - A. root pressure
  - B. capillary
  - C. mass flow
  - D. transpiration pull
  
8. An impulse crosses a synapse by means of
  - A. sodium ions
  - B. potassium ions
  - C. calcium ions
  - D. neurotransmitter chemical
  
9. Which of the following increase the rate of photosynthesis of hexose sugar during the normal respiration process?
  - A. An increase in ADP concentration
  - B. An increase in ATP concentration
  - C. An increase in concentration of hexose sugar
  - D. A decrease in concentration of photosynthesis
  
10. Which one of the following factors would contribute least to the development of new species?
  - A. Gene mutation
  - B. Chromosomal isolation
  - C. Geographical isolation
  - D. Environmental stability
  
11. Which one of the following explains why digestion of fats does not occur in the human stomach?
  - A. Absence of fat – digesting enzymes
  - B. Low pH for the fat-digesting enzymes

- C. High pH for the fat – digesting enzymes  
D. Absence of bile salts that emulsify the fats
12. Which of the following would contribute to the green house effect?  
A. Use of nuclear power  
B. Use of fossil fuels  
C. Excessive use of fertilizers  
D. Accumulation of sewage in water bodies
13. Increase in supply of blood heavily respiring tissues is caused high  
A. ventilation rate  
B. concentration of oxygen in the inhaled air  
C. carbon dioxide concentration in the blood  
D. carbon dioxide concentration in the tissues
14. Impulse transmission in mammals is usually faster than it is in amphibians because  
A. Axons in amphibians lack myelin sheath  
B. mammals have axon with larger diameter  
C. mammals usually have higher body temperature  
D. the distance between the nodes of Ranvier in mammals is shorter
15. Which one of the following would occur at the onset of an action potential in neurone?  
A. Potassium ions enter  
B. Sodium ions leave.  
C. potassium ions leave  
D. Sodium ions enter
16. Which of the following applies to the cones of the retina? They  
A. Show visual acuity  
B. perceive dim light  
C. Show much retinal convergence  
D. contain rhodopsin pigment
17. The flagellum and skeletal muscle are structurally similar in that they have  
A. microtubules  
B. actin and myosin tubules

- C. a pattern of 9+2 microtubules  
D. light and dark bands
18. During the light stage of photosynthesis, water is important raw material in that it.  
A. gives off oxygen  
B. provides hydrogen that reduces NAD  
C. reduces carbon dioxide to carbohydrates  
D. provides electrons
19. Which one of the following activities in living organisms can result in a respiratory quoties less than 1.0?  
A. when carbohydrates are respired  
B. During extensive laying down of fat in livestock  
C. At compensation point, during photosynthesis  
D. when the rate of exhalation equals that of inhalation
20. Which of the following is a difference between flowers of dicotyledonous plants and that of monocotyledonous plants? Flowers of dicotyledonous plants usually?  
A. Lack sepals  
B. possess superior ovaries  
C. bear floral parts in groups of 4s and 5s  
D. possess fused petals
21. Deciduous plants in temperate zones shed of their leaves during winter.  
A. because of water shortage  
B. to cut down the process of guttation  
C. because of too much water availability  
D. to avoid freezing temperature
22. Which of the following is true about non-competitive inhibition in enzyme catalyzed reactions?  
A. the degree of inhibition decreases with increase in substrate concentration  
B. the inhibitor has a similar structure and chemical composition with the Substrate  
C. the degree of inhibition is independent of the substrate concentration  
D. the shape of the enzymes is not affected by the inhibitor

23. Which of the following is not true of conifers?
- A. lack vessels in xylem
  - B. bear reproductive structures on leaves
  - C. Bear sporangia on cones
  - D. Possess unprotected ovules
24. The lack of a nucleus in the red blood cells enables it to
- A. have a high affinity for oxygen
  - B. be more permeable to oxygen
  - C. give up oxygen more readily
  - D. contain more haemoglobin
25. Which one of the following type of behavior is least learnt?
- A. Association
  - B. Instinct
  - C. imprinting
  - D. Insight
26. The primary meristematic tissue in plants which gives rise to the cortex is the
- A. ground meristem
  - B. procambium
  - C. protoderm
  - D. protoxylem
27. Which one of the following organisms does not possess simple eyes?
- A. Spider
  - B. Millipede
  - C. Butterfly
  - D. Centipede
28. Contraction of longitudinal muscles in insects during flight, results into
- A. flapping of wings
  - B. moving down of wings
  - C. holding wings horizontally
  - D. moving up of wings
29. During fertilization in plants, the

- A. vegetable nucleus fuses with the pollen nucleus
  - B. generative nucleus fuses with the egg nucleus
  - C. vegetation nucleus with the egg nucleus
  - D. generative nucleus fuses with the antipodal cell nucleus
30. A desert mammal's lower lethal temperature is higher than that of a mammal living in cell because a desert mammal has
- A. small extremities
  - B. poor insulation mechanisms
  - C. thick fur
  - D. a small surface area; volume ratio
31. In the energy transfer in an ecosystem, greatest loss in energy is between
- A. primary producers and primary consumers
  - B. primary consumers and secondary consumers
  - C. secondary consumers and tertiary consumers
  - D. tertiary consumers
32. A rhesus foetus whose mother is rhesus negative may not be born alive because the
- A. mother's body produces antigens against foetal antibodies
  - B. foetus lacks antibodies against the mother's antigens
  - C. mother's body produces antibodies against the foetal antigens
  - D. mother's red blood cells mix with the foetal blood
33. From a bush, 120 beetles were collected, marked and released back into the bush. A few days later, 120 beetles were collected from the same place, and 30 of them carried the mark. The estimated number of beetles in the bush is
- A. 240
  - B. 360
  - C. 480
  - D. 560
34. Insects have different mouth parts modified to suit their different modes of feeding. This shows
- A. speciation
  - B. convergent evolution
  - C. divergent evolution

- D. development of analog structures
35. Which one of the following is true of linked characteristics? They
- A. are always transmitted as a single block
  - B. are allelic to each other
  - C. occur on non – homologous chromosomes
  - D. can be transmitted independently
36. Which one of the following may act as a respiratory surface in animals?
- A. Spicracle
  - B. Bronchus
  - C. Skin
  - D. trachea
37. Which one of the following pairs of responses in plants is caused by unequal distribution of a?
- A. photoperiodism and phototropism
  - B. Geotropism and phototropism
  - C. Nastic movement and geotropism
  - D. Photoperiodism and abscission
38. The amount of progesterone in blood increases steadily from ovulation to menstruation it begins to decline because
- A. luteinizing hormone inhibits its production
  - B. it is washed out with blood during menstruation
  - C. implantation of zygote occurs
  - D. its work of repairing the uterine well gets complete
39. Figure I show relationship between temperature and rate of photosynthesis in the species A and B.



- A. B is a shade plant while A is a sun plant
  - B. A has a lower compensation point than B
  - C. A has a higher optimum temperature for photosynthesis than B
  - D. Photosynthesis does not occur in A but occurs in B
40. The absorption of amino acids after eating a heavy proteneous meal is aided by
- A. diffusion and active transport
  - B. osmosis and diffusion
  - C. diffusion and pinocytosis
  - D. active transport only

**SECTION B**

41. Mark and Mable crossed sweet pea (*Lathyrus odorata*) plant with purple flowers and long pollen grains with plants with red flowers and round pollen grains. The F<sub>1</sub> plants were all purple – flowered with long pollen grains. However, in the F<sub>2</sub> there were
- 4831 purple, long
  - 390 purple, round
  - 393 red, long
  - 1338 red, round plants
- A ratio of about 11 : 1 : 1 : 3
- (a) What theoretical ratio would you expect the four classes to show in the F<sub>2</sub>?

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(b) How would you explain the experimental ratio

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(c) By what process could such combinations as purple flowers and round pollen grains arise?

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(d) How is sex genetically determined in birds and man?

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42. (a) Define the term Homeostasis.

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(b) Explain how the following adaptations might assist in homeostasis.

(i) an elongated loop of henle in a desert animal

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(ii) a thick fur path in an arctic mammal

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(iii) The subcutaneous fat in a marine mammal

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(c) State three major processes by which water may be lost from a mammal and in each case give a reason for this loss.

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(ii)

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(iii)

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43. (a) Define the term organic evolution.

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(b) Briefly describe the use of the following for dating fossils and in each case comment on its reliability.

(i) Evidence from sedimentary rocks

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(ii) Radio active decay  
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(c) Briefly describe how each of the following can be used to provided evidence for evolution.

(i) homologous organs  
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(ii) development of vertebrate embryos  
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(iii) Industrial melanism  
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44. How is each of the following suited for its function?

(a) Red blood cell

(i)

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(ii)

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(iii)

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(iv)

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(b) Xylem vessel

(i)

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(ii)

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(iii)

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(iv)

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(v)

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(vi)

45. (a) Distinguish between dormancy and hibernation

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(b) List down four causes of dormancy.

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(c) Explain how dormancy can be advantageous to plants.

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(d) State three ways by which dormancy may be broken.

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46. (a) Give an equation that summarizes

(i) Aerobic respiration

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(ii) Anaerobic respiration

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(b) What might induce anaerobic respiration in

(i) Parenchyma cells in a plant root

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(ii) Mammalian striated (Skeletal) muscle fibres.

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(c) For each of the following respiratory quotient values in a green plant, state the types of respiratory substrate being used and the condition in which the process occurs.

R.Q	Respiratory substrate	Conditions in which process occurs
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1.0		
0.7		
0.5		

(d) Why are high respiratory quotients values obtained from tissues involved with conversion of carbohydrates to fat.

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**END**