



Dr. Blosa Science

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

SENIOR FOUR

553/1

BIOLOGY

PAPER 1

EXAM 11

TIME: 2 ¼ HOURS

Instructions:

- Answer all questions in section A and B
- Attempt any one question from section C.

Table of answers for section A

	A	B	C	D		A	B	C	D
1					16				
2					17				
3					18				
4					19				
5					20				
6					21				
7					22				
8					23				
9					24				
10					25				
11					26				
12					27				
13					28				
14					29				
15					30				

1. External digestion is found in
A: cockroaches
C: spirogyra
B: common mould
D: moss
2. A root tuber differs from a stem tuber by
A: having adventitious roots
C: having scale buds
B: lacking buds
D: developing underground
3. Which of the following substances are stored in the liver?
A: fats
B: glucose
C: starch
D: Glycogen
4. Short sightedness is corrected by
A: biconcave lens
C: convex lens
B: concave lens
D: biconvex lens
5. Which one of the following reproduces by sporangiospores?
A: Amoeba
B: Rhizopus
C: Spirogyra
D: yeast
6. In the human mouth, bitter things are tasted:

- A: on the palate
C: at the back of the mouth
- B: in the centre of the tongue
D: at the tip of the mouth
7. The largest section of the human brain is the ...
A: medulla oblongata
C: Cerebellum
- B: cerebrum
D: optic lobes
8. Which type of soil promotes capillarity most?
A: loam
B: Sandy
C: Clay
D: Gravel
9. A person with blood group AB can donate blood to person of blood group
A: A
B: AB
C: O
D: B.
10. An example of continuous variation is
A: presence of males and females in a community
B: ability and inability to roll the tongue
C: height in individuals
D: Blood groups
11. In the human body urea is produced in the
A: spleen
B: kidney nephrones
C: liver
D: ileum
12. In the human beings, the white blood cells are made in
A: spleen
B: liver
C: bone marrow
D: lymphatic
13. The tracheal system of air transport exists in
A: earthworms
B: insects
C: arachnids
D: myriapods
14. The ratio of volume of carbon dioxide over volume of oxygen consumed during the same time in an organism is called
A: Gaseous constant
C: respiratory quotient
- B: Respiratory rate
D: Diffusion gradient
15. Colour vision in human beings is made possible by
A: the lens
B: the cornea
C: the rods
D: the cones
16. The concentration of the plant hormone which stimulates shoot growth
A: stimulates root growth
C: stimulates growth of lateral roots
- B: inhibits root growth
D: inhibits growth of apical buds
17. Zygosporangia are
A: asexual reproductive structures of fungi
B: sexual reproductive structures of fungi
C: asexual reproductive structures of spirogyra

D: sexual reproductive structures of spirogyra.

18. Which pair of bones belong to human forearm?
 A: Femur and Radius
 B: Fibula and tibia
 C: Ulna and tibia
 D: humerus and Radius
19. In mammals the embryo is contained
 A: uterus
 B: amnion
 C: Placenta
 D: Luteum
20. Chemical breakdown of Lactose yields
 A: Glucose and fructose
 B: Glucose and galactose
 C: two molecules
 D: maltose and fructose
21. Which of the following animals can use their skins as respiratory surfaces?
 A: lizards and fish
 B: frogs and tadpoles
 C: frogs and earthworms
 D: fish and tadpoles
22. Which of the following substances are filtered through the glomerulus?
 A: Amino acids and red blood cells
 B: proteins and urea
 C: urea and amino acids
 D: red blood cells and proteins
23. Which one of the following is a density dependent factor in controlling populations?
 A: temperature
 B: predators
 C: rainfall
 D: bush burning
24. Which part of the human skin plays a part in body temperature control?
 A: erector pilli muscle
 B: sebaceous gland
 C: cornified layer
 D: granular layer
25. Arrange the following in order of increasing complexity.
 A: Embryo zygote, ovum, foetus
 B: zygote, foetus, ovum, embryo
 C: ovum, embryo, foetus, zygote
 D: ovum, zygote, embryo, foetus.
26. Complete metamorphosis occurs in
 A: houseflies and honey bees
 B: cockroaches and termites
 C: butterflies and housefly
 D: houseflies and cockroaches
27. In the human heart, when the ventricles contract;
 A: the heart fills with blood
 B: the semi-lunar valves close
 C: the triscupid valves open
 D: biscupid valves close.
28. Diptera to which the mosquitoes belong, is characterized by:
 A: three pairs of legs
 B: two pairs of wings
 C: two pairs of legs
 D: one pair of wings

29. Short sight and long sight are eye defects caused by
 A: changing size of the lens
 B: aging of the lens
 C: changing diameter of the eyeball
 D: changing number of the rods and cones
30. A human bone connected in a hinge joint at one end and a ball and socket joint on the other is the
 A: radius B: Femur C: ulna D: tibia

SECTION B:

31. The table 1 below shows the body surface area and volume of two land mammals A and B

Table 1

Mammal	Surface area cm ²	Volume cm ³
A	1.2	0.92
B	0.6	0.18

Table 2

Environmental temperature (°C)	Metabolic rate	(arbitrary units)
	Mammal A	Mammal B
16	10.5	12.9
18	8.9	10.9
20	7.5	9.2
22	6.4	7.8
24	5.6	6.7
26	5.0	5.8

(a) From Table 1

(i) Work out the surface area: Volume ratio of each mammal (2 marks)

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(ii) State with a reason which of the two organisms above would be least affected by change in environmental temperature

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(b) Using the graph paper provided, plot on the same graph the metabolic rate of the two mammals against environmental temperature. (7 marks)

(c) From your graph, determine the metabolic rate of each mammal at environmental temperatures of 25°C (2 marks)

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(d) (i) How does the environmental temperature affect the metabolic rate of the mammals? (2 marks)

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(ii) Explain why variation of temperature affects the metabolic rate of the mammals as stated in d (i) above (2 marks)

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(e) From the information provided, explain why at any environmental temperature, the metabolic rate of mammal B is higher than that of mammal A.

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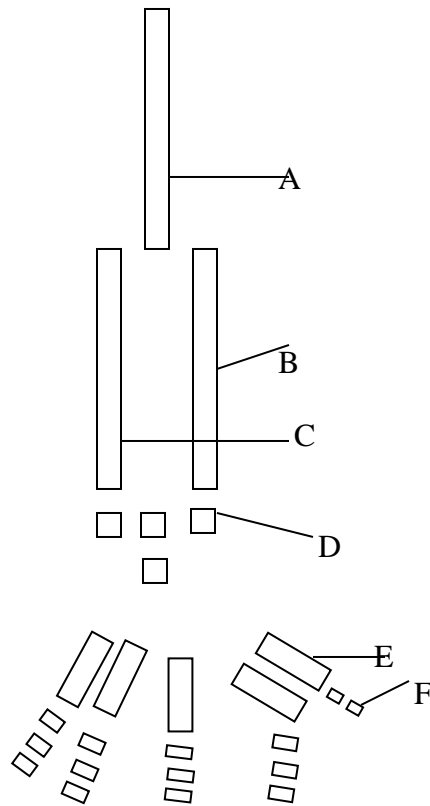
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32.



(a) (i) Identify the diagram above

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(ii) Label the parts

A

B

C

D

E

F

(b) (i) Name the joint formed between parts A and B

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(ii) Name the joints formed between the parts labeled F

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(c) State 2 modification of the above plan of a limb in the birds

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33. State one difference between the following pairs

(i) Axial skeleton	Appendicular skeleton
(ii) Bone	Cartilage
(iii) Lumbar vertebrae	Thoracic vertebra
(iv) Ligament	Tendon

(c) State 3 adaptations of a bony fish to movement in water

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SECTION C:

Attempt any **one** question

34. (a) How are birds adapted to locomotion by flight?

(b) Explain the muscular movements and their effects to bring about flight in birds.

35. (a) Explain the hormonal changes leading to the female menstrual cycle.

(b) How can a married couple avoid unwanted pregnancies?

END