UNEB UACE BIOLOGY 2008

PAPER ONE.

1. In the body, proteins may combine with acids or bases depending on the
a. Temperature of the medium
b. Hydrogen ion concentration in the medium
c. Number of solvent molecules present in the medium
d. Number of amino acid molecules in the protein.

2. The epithelia type lining the mammalian alveoli is
a. Columnar
b. Cuboid
c. Stratified
d. squamous

3. Which one of the following is correct about the first division of meiosis but not that of mitosis?
a. Nucleolus disappears
b. Spindle is formed
c. Centrioles move to opposite poles of the nucleus
d. Homologous chromosomes associate to form bivalents.

4. Worker bees and the queen are bee are polymorphic forms which differ in their fertility as a result of
a. Feeding on different diets
b. Worker's eggs not being fertilized
c. W+orkers being produced parthenogenetically
d. The queen having diploid cells while the workers have haploid cells.

5. Which of the following ions move from the plasma into the red blood cells to maintain electro-neutrality during the uptake of carbondioxide by the blood in the tissues?
a. CI
b. CO
c. K
d. HCO

6. Which one of the following is not a correct statement about nastic response?
a. The response may be a growth movement
b. The direction of movement of a plant is always related to the direction of the stimulus
c. It is a response from a non-directional stimuli
d. The light period is interrupted with short dark period.

7. Long-day plants may be stimulated to flower if
a. The period of darkness is interrupted with flashes of light
b. Provided with more than 10 hours of light
c. Provided with 12 hours of complete darkness
d. The light period is interrupted with short dark period

8. Wearing a coarse shirt causes unpleasant sensation at first but later the discomfort disappears because
a. With continued stimulus, generator potential falls below threshold value
b. The post-synaptic surfaces fail to release the transmitter substance
c. Nervous system stops carrying sensory impulses
d. Continued stimulation leads to fusion of generator potentials.

9. Which one of the following is the correct shape in the region of the body of an earth worm where its circular muscles are contracted?
a. Short and thick
b. Long and thin
c. Short and thin
d. Long and thick

10. Chiroleples, the desert frog flourishes in the desert because it
a. Has a water proof skin
b. Is nocturnal
c. Has few and small glomeruli
d. Reabsorbs metabolic water.

11. Which one of the following is the ultimate hydrogen acceptor during an anaerobic respiration in animals?
a. Lactic acid
b. NAD
c. Pyruvic acid
d. Acetyladehyde

12. Which one of the following is unlikely to be found in the body cells of obligate anaerobes?
a. Glycolytic enzymes
b. ATP
c. Mitochondria
d. Sugars

13. Which one of the following is illustrated in figure 1?

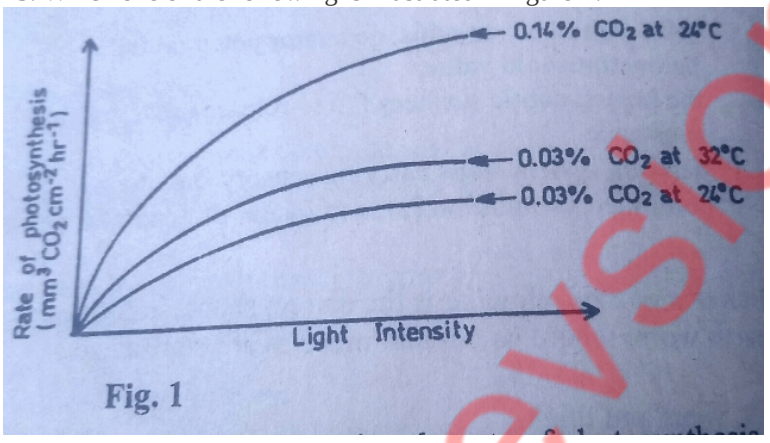

Fig. 1

a. Which increases in light intensity, the rate of photosynthesis increases until temperature becomes a limiting factor.
b. Rate of photosynthesis increases with an increase in the carbondioxide concentration.
c. With increase in light intensity, the rate of photosynthesis increase indefinitely.
d. Rate of photosynthesis increases with an increase in light intensity until carbondioxide concentration becomes a limiting factor.

14. Which one of the following is not a fibrous protein?
a. Keratin
b. Globulin
c. Elastin
d. Collagen

15. Which one of the following activities would result into a low respiratory quotient?
a. Respiration in muscles during heavy exercise
b. Formation of calcareous shells
c. Preparation for hibernation in a mammal

16. A probable function of the endoplasmic reticulum is to
a. Control the entry and exit of materials in cells
b. Facilitate intracellular transport of materials
c. Act as template in protein synthesis
d. Enable substances diffuse against concentration gradient.

17. The rapid stomatal closure during wilting is due to
a. Increase in abscisic acid
b. Rapid conversion of sugar to starch
c. Rapid accumulation of carbondioxide in the guard cells
d. Reduction in the level of mineral ions in the guard cells

18. Cartilaginous fish retain urea In the blood in order to
a. Avoid dehydration
b. Reduce entry of salts into the tissues
c. Avoid loss of excess water by excreting it
d. Maintain an internal ionic concentration in balance with the external medium

19. Which one of the following organisms does not belong to the same phylum as the reset?
a. Tape worms
b. Liver fluke
c. Planaria
d. Leech.

20. A cockroach has a respiratory system while an earth worm does not because
a. Earthworms do not need much oxygen
b. The surface volume ratio in a cockroach is small
c. Earthworms can be parasitic
d. The respiratory system provides shape in a cockroach

21. Which one of the following structures is not homologous with the rest?
a. Bat wing
b. Human fore arm
c. Insect wing
d. Bird wing

22. Which one of the following has the greatest biomass in an ecosystem?
a. Tertiary consumers
b. Primary producers
c. Secondary consumers
d. Primary consumers

23. Which one of the following is an effect of the luteinizing hormone?
a. Development of the graafian follicles.
b. Ovulation
c. Stimulation of sperm production
d. Repair of the uterine wall

24. Which one of the following is a correct statement about a neurone membrane during resting potential?
a. The inside of the neurone membrane is negatively charged.
b. The Na, K and CI ions are evenely distributed on either side of the membrane.
c. The concentration of Na ions is greater inside the membrane
d. The concentration of K ions is greater outside the membrane.

25. Which one of the following statements is not correct about a test cross?
a. It is carried out on an organism with a dominant phenotype
b. The offspring of the cross may all have dominant phenotype
c. The organism of the unknown genotype is crossed with a homozygous dominant individual
d. The offspring of the cross may have the ratio of 1 dominant phenotype: 1 recessive phenotype.

26. Which of the following conditions result from gene mutation?
a. Klinefelter's syndrome
b. Turner's syndrome
c. Sickle cell anaemia
d. Down's syndrome

27. If the triplet of mRNA is AAG what is the complementary triplet of the bases on the tRNA molecule?
a. TTC
b. UUC
c. CCT
d. CCU

28. Which one of the following factors does not increase the chances of fertilization in mammals?
a. Seasonal breeding cycles.
b. Female receptiveness to the male only during ovulation
c. Internal fertilization
d. Development of secondary sex characteristics

29. Which one of the following is not a problem that endoparasites face in their transmission?
a. Leaving the host
b. Entering the host
c. Leaving away from the host
d. Identifying the host

30. Which one of the following statements is correct about the exponential phase in the population growth?
a. Death rate and birth rate are equal
b. Numbers of individuals and rate of growth increase
c. The numbers outstrip the supply of factors for support
d. Slow growth of the population.

31. An organism living in an oxygen deficient environment has
a. Haemoglobin that easily picks up oxygen
b. Its oxygen dissociation curve to the right
c. Haemoglobin that readily releases its oxygen
d. Haemoglobin that less readily picks up oxygen

32. Which one of the following is not a purpose for courtship behavior among animals?
a. Ensuring the both partners are sexually mature
b. Establishing a pair-bond
c. Ensuring that both partners are ready for mating
d. Establishing territories.

33. Which one of the following statements is not correct about seed dormancy?
a. It allows further development of the seed
b. It is induced by internal factors
c. It increases the chances of survival of the seed
d. It is ended by external factors

34. Figure 2 shows that

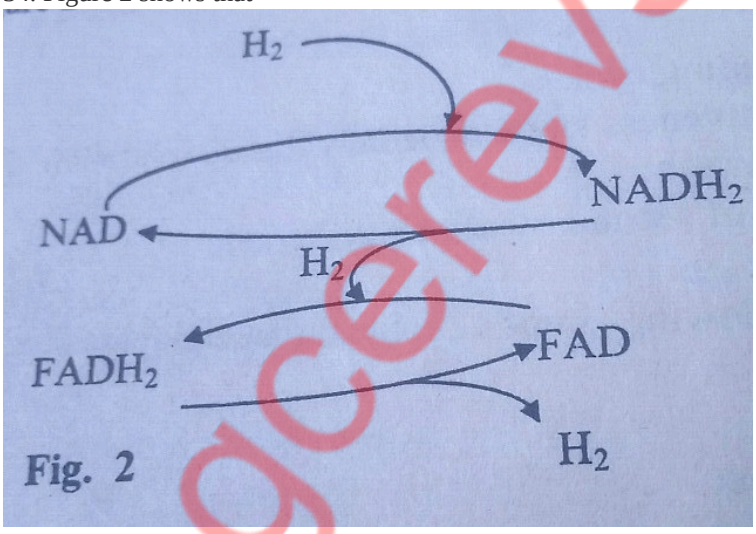

Fig. 2

a. NAD is oxidized to NADH
b. NADH reduces FAD to FADH
c. FADH is reduced to FAD
d. NADH + H----------NAD

35. The number of organisms in each tropical level reduces as one moves up food chain because
a. Energy is lost in moving from one trophic level to another
b. Energy is lost from the top trophic levels
c. Organisms in higher trophic levels are less productive
d. Of high level of predation at the top trophic levels.

36. Anerobes thrive better than aerobic organisms in waters experiencing thermal pollution because
a. High temperature kill aerobic organisms
b. Anaerobes posses enzymes that work best at high temperatures
c. High temperatures reduce solubility of oxygen
d. High temperatures encourage multiplication of aerobes' predators.

37. Which one of the following is correct about parallel flow of water across the gills?
a. Water has a higher oxygen concentration at each point of contact
b. Low blood oxygen concentration is attained

c. Diffusion occurs over the whole region of the grill filament
d. High blood oxygen concentration is achieved.

38. Which one of the following adaptations of xerophytes does not reduce transpiration?
a. Hairy leaves
b. Leaves with thick waxy circle
c. Small sized leaves
d. Succulent stems

39. The influx of water in fresh water bony fish is offset by possession of
a. Numerous, large glomeruli and re-absorption of salts from the renal fluid.
b. Numerous, small glomeruli and extrusion of salts from the body.
c. Few large glomeruli and uptake of salts
d. Many small glomeruli and uptake of salts.

40. The main difference between endotherms and ectotherms is that ectotherms
a. Gain their body heat from internal sources
b. Gain less heat than endotherms
c. Gain the body heat from external sources
d. Are lower animals while endotherms are higher animals.

SECTION B
Answer all questions in this section in the spaces provided.

41. Figure 3 shows the variation of rate of photosynthesis with temperature in C3 and C4 plants, at different light intensities.

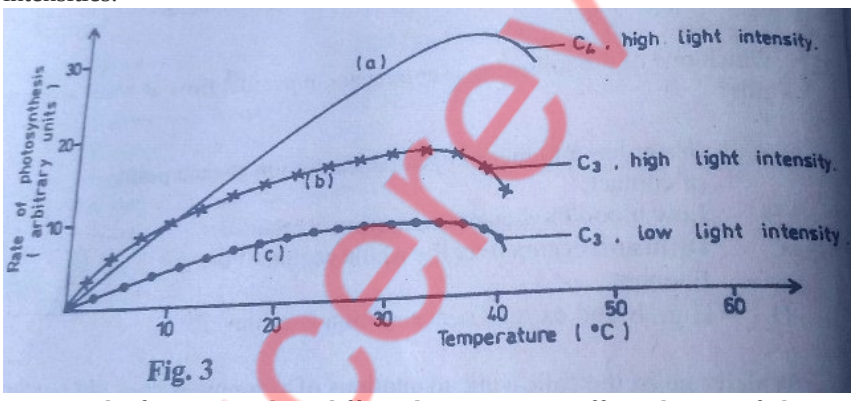

Fig. 3

a. Using the figure, state how differently temperature affects the rate of photosynthesis in C3 plants from C4 plants at high intensity.
b. Explain the differences in the effect of temperature on the rate of photosynthesis in C3 and C4 plants at high light intensities stated in (a).
c. Explain the pattern of curve (c) in the figure

42. What is meant by apical dominance?
b. state the causes of each of the following
(i). Apical dominance
(ii). Seed dormancy
d. What is the ecological importance of
(i) Apical dominance?
(ii) Seed dormancy?

43. Explain the absence of a yolk sac in the development of a human foetus while it is an important structure in the development of birds.
b). state the reproductive adaptations of birds to terrestrial life.

c). Give three forms of parental care provided by mammals.

44. What is instinctive behaviour?
b). state two factors that influence instinctive behavior.
C). Territorial behavior is common among many animal species. Give
(i) Four advantages of this behavior
(ii) Three disadvantages of this behavior

45. Illustrating with a cell of one pair of homologous chromosomes, draw diagrams in the space below to show
(i) Mitotic metaphase
(ii) Meiotic metaphase I
(iii) Meiotic metaphase II
b) explain how meiosis contributes to genetic variation.

46. Figure 4 shows the immune response of a person's blood after vaccinations are given on day one and 60 days later.

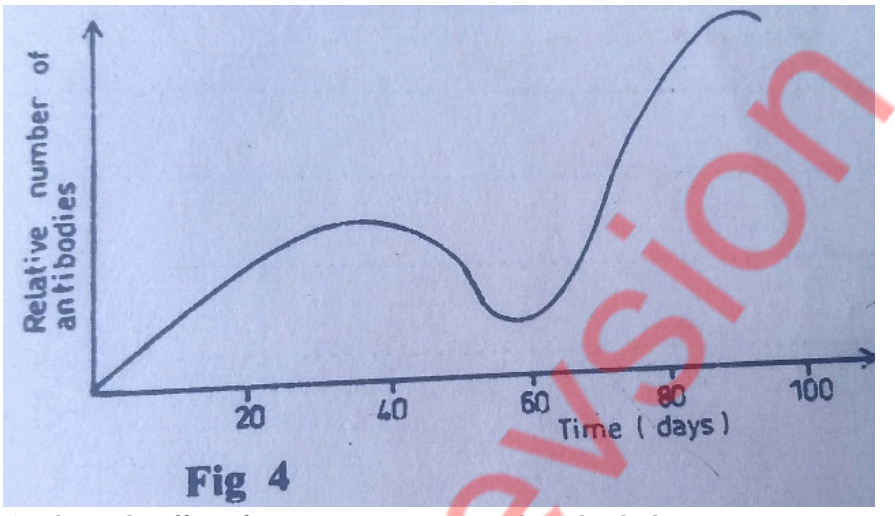

Fig 4

a). what is the effect of giving immunization to the individual?
b) from the graph, state the type of immunity acquired by the individual, giving a reason.
C) explain the shape of the graph
d). describe three ways in which antibodies combat antigens.

PAPER TWO

THEORY
ANSWER QUESTION ONE IN SECTION A PLUS THREE OTHERS FROM SECTION B.

1. Table 1 shows percentages by volume of some gases in inspired air, expired air and alveolar, in a resting human being.

Table 1

	Percentage volume(%)		
Gas	Inspired Air	Expired air	Alveolar air
Oxygen			
Nitrogen			No data
Carbondioxide			
Water Vapour			No data

Figure 1 a and b show effects of increased carbondioxide concentrations in inspired air, on the volume of air breathed in and out per minute and on the breathing rate respectively.

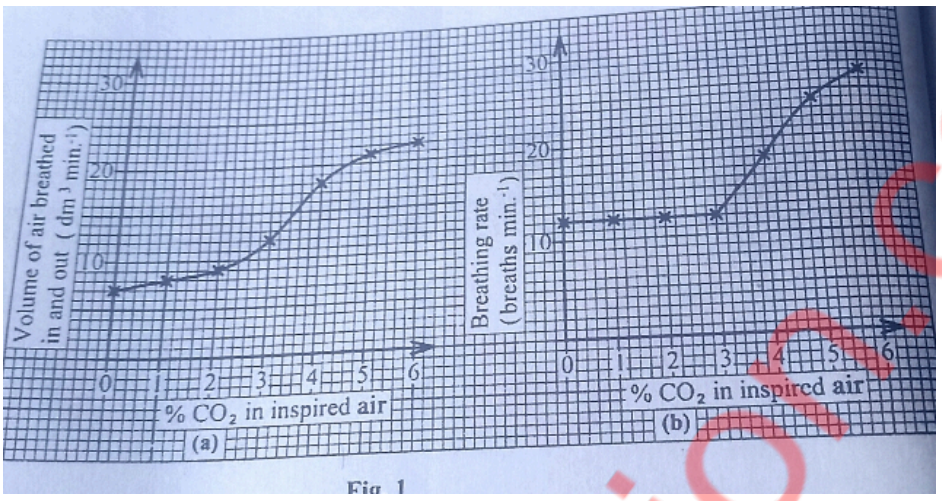

Fig. 1

a. Explain why
(i) The percentage volume of oxygen in expired air is intermediate between the inspired and alveolar values.
(ii) There is a difference in the percentage volume of nitrogen between inspired and expired air.

b. (i) Using the information in figure 1, calculate the mean volumes of a single breathe in and out, at a different carbondioxide concentrations in inspired air indicated in

Table 2

Percentage concentration of CO2 in inspired air.	0	1	2	3	4	5	6

(iii) Plot a graph showing the mean volume of a single breath against percentage concentration of carbondioxide in inspired air.

c. Describe the effect of the increase in carbondioxide concentration in inspired air on the
(i) Volume of air breathed in and out per minute
(ii) Breathing rate
(iii) Mean volume of a single breathin and out

d. Outline the physiological effects in the body, of breathing in excess
(i) Carbondioxide
(ii) Oxygen

SECTION B
Answer any three questions from this section.

2. (a) ouline the events that lead to the formation of pollen grains in flowering plants.

(b) How does the development of the embryo sac in flowering plants differ from oogenesis in humans.

(c) give an outline of the life cycle of a named pteridophyte.

3 Describe the structure of DNA?

b. using an example, explain an effect of gene mutation in humans.

c. What is the significance of mutation in crop husbandry?

4. (a) Give an outline of the classification of muscular tissues.

(b) Describe the structure of the phloem and cardiac tissues.

(c) Explain how the structures of the phloem and cardiac muscle are related to their functions.

5. (a) Explain how light may affect the activities of organisms.

(b) Why does transpiration occur mainly through leaves other than other parts of plant.

6. (a) (i) What are chemoheterophic bacteria?

(ii) Give the groups of the type of bacteria in (a) (i).

(b) Using examples, explain the ecological importance of each of the groups in (a) (ii) in an ecosystem.