MOI HIGH SCHOOL- KABARAK – 2017

BIOLOGY PAPER 1

MARKING SCHEME

1. (i) Physiology – Study of body functions and activities of life (physical and chemical activities)
   (ii) Dermatology – Study of the skin and its diseases.

2. Meaning – Polarization of a cell membrane means it has net positive charge to the outside and a net negative charge to the inside
   Significance – Enables the membrane to detect changes in the environment.

3. a) Site for photosynthesis
   b)i) Grana/granum
   ii) Stroma

4. Emulsification
   - Provide an alkaline medium for the functioning of pancreatic enzymes
   - Neutralize the acidic chyme from the stomach.

5. Arachnida
   - Crustacea

6. Mouth modified to a beak
   - Forelimbs modified to wings
   - Body covered with feathers

7. Spermatophyta are seed bearing plants, pteridophyta produce spores, spermatophyte have flowers cones ptendophyta have sporangia.

8. (i) Prothallus
   ii) B – Archegonia
   D – Rhizoid

9. a) They alternate between gametophyte phase and sporophyte phase/Existence in two forms, spore producing (sporophyte) and gamete producing structure (Gametophyte)

   b) Pteridophyta
   Bryophyta

   c) Produces male gametes that undergo fertilization to produce a zygote which develop to a sporophyte.

10. a) $\frac{CO_2 \text{ produced}}{O_2 \text{used}} = \frac{18}{26} = 0.69 = 0.7$

b) lipids
c) Provides information on the type of substrate oxidised
- Gives information on the type of respiration/metabolism taking place

11. a)i) Y – Gill raker (reject rakers)
ii) Z – Gill bar
iii) X – Gill filament (reject filaments)

b) Y – Gill raker – teeth like structures to prevent solid materials present in water from reaching the delicate gill filaments
Z – Bill bar – long, curved, bony to provide large surface area for attachment of gill filaments and rakers

12. a) Dicotyledonous root (reject dicot)
b) P – Phloem
M – Epidermis/piliferous layer
Q – Xylem

13. Companion cells
Sieve tubes

14. Crossing over which brings about variation

15. a) Locomotory responses of a whole organism or motile cell e.g a gamete in response to. an external stimulus

b) Enables an organism to escape from injurious stimuli and to seek favourable habitats
Enables organisms to seek favourable habitats and acquire resources e.g nutrients and mates
Chemotaxis enables fertilization to take place

16. i) Thigmotropism/Haptotropism

ii) The part of the stem in contact with hard object has a lower auxin concentration than the outer part; contact causes lateral migration to the outer side of the stem. Since high auxin concentration promote faster growth in shoots, high concentration in outer part causes faster growth.

17. a) Homologous structures are structures with the same embryonic origin but modified to perform different functions.

18. Comparing embryos of different vertebrates show morphological similarities in structures and forms. The closer the resemblance the close the phylogenic origin..

19. Phenotypic changes cannot be transmitted to the offspring
Only changes in DNA can cause change in inherited characteristics.

20. Coleorhiza protects tip of radicle
Coleoptile protect the tip of plumule

21. a) Both belong to different species. They may interbreed to produce a sterile offspring (the mule)

b) Classification is the grouping of living organisms according to their structure
Taxonomy is the science of classification

22. a) Nephron

b) C and D

23. a) Hypothalamus contain thermoreceptors which detect blood temperature as well as the thermoregulatory centre. Hypothalamus initiate changes by transmission of nerve impulses to the effectors for corrective action.

b) Insulin stimulate liver cells to convert excess sugar/glucose to stored glycogen when the sugar level of blood rises beyond normal 90mg/100cm^3 of blood glucagon stimulate liver cells to convert stored glycogen to glucose/sugar when the level of sugar in blood falls below the normal, 90mg/100cm^3 of blood.

24. a) To establish the genotype of an unknown organism exhibiting the characteristic of the dominant gene.

b) Stores the genetic information in a coded form to enable transfer of the genetic material from the parent to the offspring.

25. Sickle shaped red blood cells make the plasmodium parasite unable to survive in them hence the person becomes resistant to malaria attack.

26. a) Thoraic vertebra

b) Long reural spine towards the posterior for attachment of muscles.
Transverse processes are short and bear tubercular facets for articulation with tuberculum of the ri.
Centrum has capitulum facet or demifacet that articulates with capitulum of the rib
Has anterior articular facet for articulation with adjacent thoracic vertebrae.

27. Lateral view
Anterior view

28. Pollination
Photosynthesis
Seed and fruit dispersal
Deep rooted/rooted
Thick cell walls.

R – Full light/sufficient light/adequate light
S – In the dark/dim light
Q – Unidirectional light

b)

R	S
Short stem	long stem
Shorter internodes	longer internodes
Thick stem	thinner stem
Larger leaves	small leaves
Green leaves	yellow leaves
Green stem	light yellow stem