**FORM 4 PAPER 1– END TERM TWO MARKING SCHEME**

1.Name three sites of gaseous exchange in frogs. (3mks)

Skin; buccal/mouth cavity; lungs;

2.a) What is organic evolution (1mk)

b) Distinguish between divergent and convergent evolution giving

example in each case. (4mk)

(a) Emergence of present fauna and flora/ new life form/ species/ organisms from pre-existing forms gradually over a long period of time.

(b) Divergent basic structural form is modified to serve different functions; e.g. vertebrate forelimbs, break structure in birds/ feet in birds’ convergent different structures are modified to perform similar functions e.g. wings and birds and insects/ eye of human and octopus, vertebrates for humans acc. legs of vertebrate and mouthparts of insects

3.State three applications of plant hormones in agriculture (3 marks)

* Induce fast growth in stem cut to curl around support e.g climbers;
* Selective weed killers;
* Encourage apical dominance;
* Encourage sprouting of side branches;
* Breaking seed dormancy;
* Induce pathenocarpy
* Promotes flowering
* Induce fruit falls; any four
* Accelerate ripening of fruits e.g. tomatoe

4 (a) Give an equation to show that respiration involves oxidation of glucose (1mk)

glucose + oxygen carbon(IV) oxide + water + energy

C6H12O6 + 6O2 6CO2 +6H2O + 2880 kJ;**must be balanced**;

(b) How is an energy rich molecule rebuilt after muscle contraction (2mks)

Adenosine diphosphate combines with a phosphate and 34kJ of energy; to form adenosine triphosphate/ATP

(c)apart from energy, name another end product of anaerobic respiration in animals(1mks)

Lactic acid

5. Give the functions of the following ecological instruments (2mks)

(a) Seechi disc

Measure light penetration in water;

(b) Photographic light meter

measure light intensity

6.a) Which genetic disorder is caused by lack of a gene which causes production of Melanin. (1mk)

albinism

7.List down **two** phenotypic characteristics that have been selected for the production of strains suitable for modern agricultural purposes (2mks)

.Increased length of productive season; higher yields; ease of harvesting where dwarf varieties are prefered; flowers such as roses are selectively bred for their color, shape and aroma; **acc; the 1st 3;**  (3mks)

8.A plant was observed to have parallel venation and fibrous root system. Name.

(i) Subdivision of this plant. (1 mk)

Angiosopermaphyta;

(ii) Class to which the plant belongs. (1 mk)

Monocotyledonae; (Rej monocot/monocotyledon)

9.Name the organism that;

(a) (i) causes malaria 1 mark)

Plasmodium malariae/vivax/falciparum/ovale;

(ii) Transmits malaria 1 mark)

Female anopheles mosquito

(b) State two control measures for malaria (2 marks)

Use of antimalarial drugs

- sleep under treated mosquito nets

Drain stagnant water

Clear bushes around homes

Any two correct

10..Explain two milestones in the evolution of man that have made him the most

Dominant species on earth. (2marks)

-Man has a larger brain giving him more intellectual capacity and this has enabled him

To exploit their environment fully.

-Ability to speak/use language to communicate clearly with his fellow men.

-Bipedal locomotion, upright posture that frees the hands and rises them to manipulate

The environment and carry objects.

-Aprehensile/grasping hand that enables him to handle things with a high degree of

precision.

-Forward facing eyes which gives him a three dimensional view for the purpose of

Judging distances and have wider angle of view.

Any two correct

11.50 black mice and 50 white mice were released into an area inhibited by a pair of owls. After four months 38 of the black mice and 9 of the white mice were recaptured.

a) How this observation would be explained. (2 marks)

Black mice are better adapted / camouflage with the environment hence less are eaten by the owls compared to the white mice which are easily seen and eaten; *2mks*

b) Name the theory of evolution that support the results in (a) above. (1mark)

Theory of natural selection;

c) Name one vestigial structures in man. (1 marks)

c) Caecum and appendix; Coccyx; nictating

12.State the functions of the following apparatus.

1. Bait trap (1mk)

Attracts organisms using food as bait; and traps them.

(ii) Pooter (1mk)

Sucks small organisms from bark of a tree;

13.a) Define the term ‘parthenocarpy’. (1mk)

Fruit formnation without fertilization;

(b)Name **two** plant growth hormones that promote parthenocarpy. (2mks)

Auxins;

Gibberellins;

14.What is the biological importance of the larval stage during metamorphosis (2mks)

Feeding and growth;

Reduce competition within the species;

15.a) State **one** structural and one functional difference between motor and sensory neurone. (2mks)

Structural:-

|  |  |
| --- | --- |
| Sensory | Motor |
| Cell body outside CNS | Cell body inside CNS |
| Bipolar | Unipolar |

Functional:-

sensory neurone transmit impulses from the receptor to the CNS while moyor neurone transmit impulse from the CNS to effectors

b)What name is given to the gap between the sensory neurone and intermediate

neurones. (1mk)

Synapse, neuro junction

(c) Name the transmitter substance found in the gap named in (b) above. (1mk)

Acetylcholine;/Noradrenaline;

16.Name the type of response shown by: (2mks)

a)Sperms when they swim towards ovum.

Positive (chemo) taxis

(b) Euglena when they swim towards the source of light.

Positive phototaxis

17.Give **two** reasons why the pressure of blood is greater in the arteries than in the veins in mammals. (2 marks)

Arteries have narrow lumen to maintain pressure;

Havemore muscular walls;

Receive blood at high pressure from the heart;

18.a) What is the importance of heartbeat in blood circulation? (1mk)

It ensures sufficient supply of nutrients and oxygen to the cells;

- It ensures exchange and removal of waste products of metabolism from the body cells to excretory organs;

- It ensures that blood flows out of the heart to all parts of the body;

b) If the nerve supply to the heart of a mammal is severed, the rhythmic heart movement will still go on and the heart continues to beat. Explain this observation. (1mk)

The rhythmic contractions of the heart arises from within special cardiac muscles/the

heart muscles are myogenic;

19. What happens when respiration exceeds photosynthesis in the guard cells of terrestrial plants? (3 mks)

Carbon(IV)oxide increases in the guard cell; pH increases leading to conversion of glucose to starch; starch is osmotically inactive compared to glucose; this leads to guard cells loosing water to the surrounding epidermal cells; guard cells becomes flaccid and hence stoma closes.

20.a) Name the hard body covering found in organisms of the phylum arthropoda. (1mk)

exoskeleton

b)Give **two** uses of the structure mentioned in (a) above. (2mks)

Protection against desiccation

Protection against mechanical injury

For muscle attachment

21.Describe how the following conditions promotes cross pollination

1. heterostyly ( 1 mark)

when the style is longer than th filaments, its not easy for pollein grains to reach the stigma of the same flower

1. self sterility ( 1 mark)

pollein grains becomes sterile or incompatible to the stigma of the same flower;

22.Distinguish between plasmolysis and deplasmolysis as used in cell physiology( 3 marks)

plasmolysis is a process by which plant cells lose water by osmosis ( when placed in hypertonic solution) becoming flaccid; while deplasmolysis is process by which flaccid/plasmolysed cell gains water by osmosis; (when placed in distilled water);becoming turgid;

23.Explain how surface area to volume ratio affect the rate of diffusion in living organisms ( 2 marks)

the larger the surface area to volume ratio the greater the rate of diffusion; since most parts of of the organisms are closer to the medium of exchange/ surroundings;

24.State two differences between the product of mitotic division and those meiotic division ( 2 marks)

|  |  |
| --- | --- |
| mitosis | meiosis |
| 2 daughter cells produced  Daughter cells are diploid | 4 daugter ells produced  Daughter cells are haploid |

25. Explain why fresh water aquatic animals excrete nitrogenous waste inform of a ammonia ( 3 marks)

Ammonia is very toxic/ poisonous; hence it requires a lot of water to eliminate; which is available in large amount;

26.Alongside alimentary canal are enzyme that digest food into simpler absorbable forms. study the illustration below to answer questions that follows

enzyme K enzyme L

protein peptide aminoacids

1. Identify enzyme K and its site of action in alimentary canal (2 marks)

|  |  |
| --- | --- |
| Enzyme | Site of action |
| Pepsin | Stomach |
| Trypsin | Duodenum |

1. Identify enzyme L and state its pH under which it works best ( 2 marks)

|  |  |
| --- | --- |
| Enzyme | pH |
| Peptidase | Alkaline |

27.(a) What makes young herbaceous plants remain upright (2 marks)

Cell turgidity; turgor pressure

Presence of collenchymas tissue;

(b) Why should herbaceous plant remain upright ( 2marks)

- to expose to leaves to light energy for photosythensis

- to expose the flowers to pollinating agents

- to expose seeds/ fruits to dispersal agents;

28.(a) Name the main excretory product stored in the coffee berries (1mk)

Caffein

b)What is the economic use of the products named in a (a) above ( 1 mark)

used as a mild stimulant

29.(a) state one advantages of asexual reproduction (1mk)

* favorable characteristics of parents retained
* exploit favorable conditions of the parents
* shorter life cycle/ early maturity/ faster reproduction
* independent of two parents/ fertilization/ pollination
* large supply/ store of food
* new plants produced in conditions already favorable to parent

30.Define the term photolysis ( 1 marks)

breakdown of water molecules into hydrogen atoms and oxygen gas; by light energy; ( on light stage of photosythensis)

31.Outline one functions of the femur bone ( 2 marks)

* provide site for ( thigh ) muscle attachment
* provide support hind-limbs/body
* bone marrow is a site for blood cells/ white blood cells formation

articulate with tibia (knee joint) and pelvic bone (hip joint/ball and socket joint)