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Code Number 044/



INDIAN SCHOOL MUSCAT
FINAL TERM EXAMINATION
BIOLOGY (MARKING SCHEME)

CLASS: XI

Sub.Code: 044

Time Allotted: 3 Hrs

DATE: 25.02.2018

Max.Marks: 70

SECTION A

- 1 The cells which do not divide continuously will enter into G₀ stage. 1
- 2 Natural – taking all characteristics into consideration(½) 1
Artificial – taking only a few important characteristics into consideration(½)
- 3 Deuteromycetes 1
- 4 Blood 1
- 5 a) Inner to the endodermis 1
b) Radial
c) parenchyma
d) Casparialthickening (4x ¼)

SECTION B

- 6 a) Homologous chromosomes pair to form a structure called synaptonemal complex 2
during prophase I of Meiosis I. (1)
b) During metaphase, the chromosomes align at the equator and is called metaphase
plate. (1)
- 7 Glucose (1) 2
When glucose is used as respiratory substrate, the respiratory quotient is 1 since the
amount of CO₂ evolved is equal to the amount of O₂ inhaled. (1)
- 8 Water molecules have kinetic energy, (1) when concentration of water molecules 2
increase, the KE also increases. (1)

9 **a) Ribosome b) Mitochondria c) lysosome d) endoplasmic reticulum (1/2 x 4)** 2

OR

In plant cells, wall formation starts in the centre of the cell and grows outward to meet the existing lateral walls. The formation of the new cell wall begins with the formation of a simple precursor, called the cell-plate that represents the middle lamella between the walls of two adjacent cells. (1) In an animal cell, this is achieved by the appearance of a furrow in the plasma membrane. The furrow gradually deepens and ultimately joins in the centre dividing the cell cytoplasm into two. (1)

10 Apex never culminates in a flower, and bear flowers in an acropetal succession. (1) 2

Cymose inflorescence culminates in flower and bear flowers in a basipetal succession. (1)

SECTION C

11 (i) Increases the length of the stem and yield in sugarcane. 3

(ii) Delay senescence

(iii) Elongation of apple fruit to give shape (or any 3 value points)

12 (i) Pivot 3

(ii) Hinge

(iii) Ball and Socket

(iv) Fibrous joint(1/2 x 4)

synovial joints are characterized by synovial fluids (1)

13 Glycolysis (1) Cytoplasm (1/2) Pyruvic acid (1/2) ATP & NADPH (1) 3

14 Between amino acids of proteins, Between monosaccharides of a polysaccharide and 3
between Sugar and phosphorous in DNA. (1/2 X3)

Isomerases, Ligase, Transferases (1/2 X 3)

15 (1) Bundle sheath cells 3

(2) Mesophyll cells

(3) Kranz anatomy

(4) C4 pathway(1/2 x4)

In the photorespiratory pathway, there is neither synthesis of sugars, nor of ATP. Rather it results in the release of CO₂ with the utilisation of ATP. In the photorespiratory pathway there is no synthesis of ATP or NADPH. Therefore, photorespiration is a

wasteful process. (1)

16 Bryophytes because they need water for completing their life cycle.(1) 3

Antheridium ,Archaeogonium ($\frac{1}{2} \times 2$)

Rhizoids (1)

17 When a stimulus is applied at a site on the polarised membrane, the membrane at the site 3

A becomes freely permeable to Na^+ (1). This leads to a rapid influx of Na^+ followed by the reversal of the polarity at that site, i.e., the outer surface of the membrane becomes negatively charged and the inner side(1) becomes positively charged. (1)The polarity of the membrane at the site A is thus reversed and hence depolarised.

OR

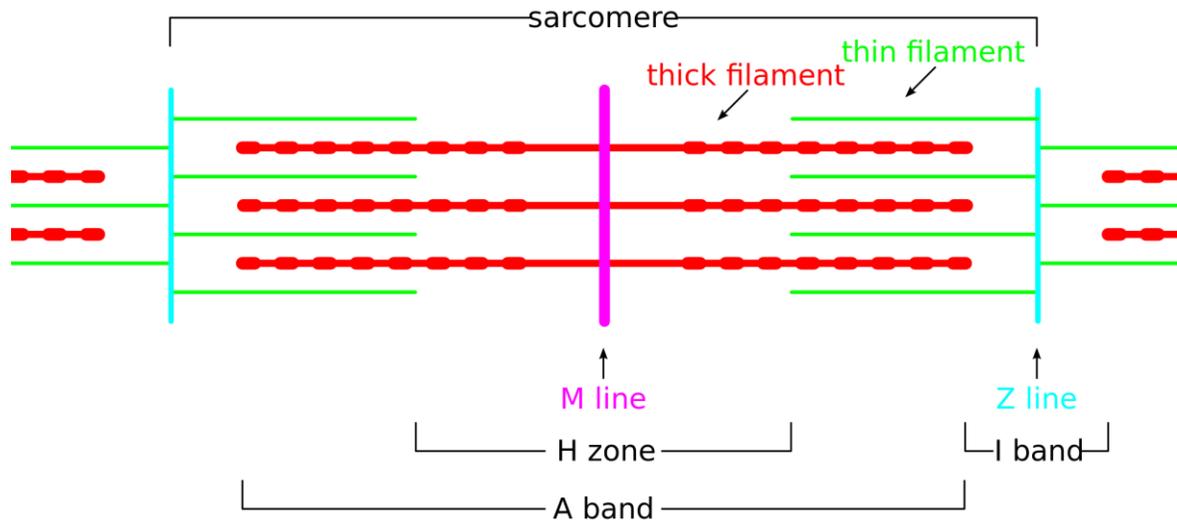
a) Pepsin- protein- peptones/peptides

b) Trypsinogen - protenins/ peptones/peptides- dipeptides($\frac{1}{2}$ each)

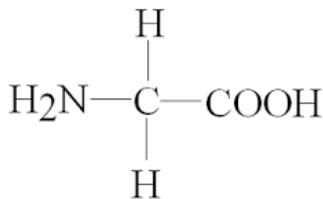
18 (i) Uterine contractions (ii) Fall of calcium ion level in blood (iii) Basal metabolic 3
rate

a) Oxytocin b) thyrocalcitonis c) thyroxine

19 3



20 $\text{H}, \text{COOH}, \text{NH}_2$ 3

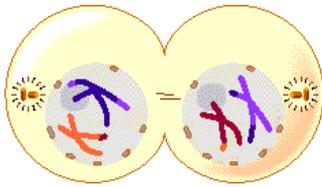


glycine

(1+2)

- 21 Nucleosides – sugar and nitrogen base, cytidine, uridine 3
Nucleotides – sugar, nitrogen base and phosphorous, adenylic acid, thymidic acid (1 ½
x2)

- 22 3



32 chromosomes, C (½ x 2)

Telophase 1 (1)

Chromosomes cluster at opposite spindle poles and their identity is lost as discrete elements. (½)

Nuclear envelope assembles around the chromosome clusters. (½)

Nucleolus, golgi complex and ER reform. (½)

SECTION D

- 23 (1) Insulin 4
(2) It reduces the blood sugar level
(3) Digestive enzymes will digest it
(4) Care, alert, concern or any significant value (4x1)

SECTION E

- 24 The proximity between the Henle's loop and vasa recta, as well as the counter current in 5
them help in maintaining an increasing osmolarity towards the inner medullary
interstitium, i.e., from 300 mOsmolL⁻¹ in the cortex to about 1200 mOsmolL⁻¹ in the
inner medulla. This gradient is mainly caused by NaCl and urea. NaCl is transported by
the ascending limb of Henle's loop which is exchanged with the descending limb of vasa
recta. NaCl is returned to the interstitium by the ascending portion of vasa recta.
Similarly, small amounts of urea enter the thin segment of the ascending limb of Henle's
loop which is transported back to the interstitium by the collecting tubule. The above
described transport of substances facilitated by the special arrangement of Henle's loop
and vasa recta is called the counter current mechanism

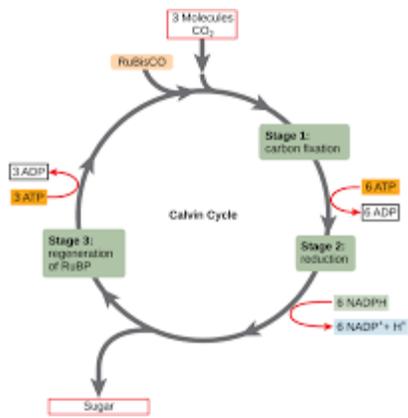
OR

Respiration involves the following steps: (i) Breathing or pulmonary ventilation by which atmospheric air is drawn in and CO₂ rich alveolar air is released out. (ii) Diffusion of gases (O₂ and CO₂) across alveolar membrane. (iii) Transport of gases by the blood. (iv) Diffusion of O₂ and CO₂ between blood and tissues. (v) Utilisation of O₂ by the cells for catabolic reactions and resultant release of CO₂. (2 ½)

About 97 per cent of O₂ is transported by RBCs in the blood.(1/2). It forms oxyhaemoglobin (1) The remaining 3 per cent of O₂ is carried in a dissolved state through the plasma. (1)

25 The Calvin cycle proceeds in three stages : (1) carboxylation, during which CO₂ combines with ribulose-1,5-bisphosphate; (2) reduction, during which carbohydrate is formed at the expense of the photochemically made ATP and NADPH; and (3) regeneration during which the CO₂ acceptor ribulose1,5-bisphosphate is formed again so that the cycle continues.

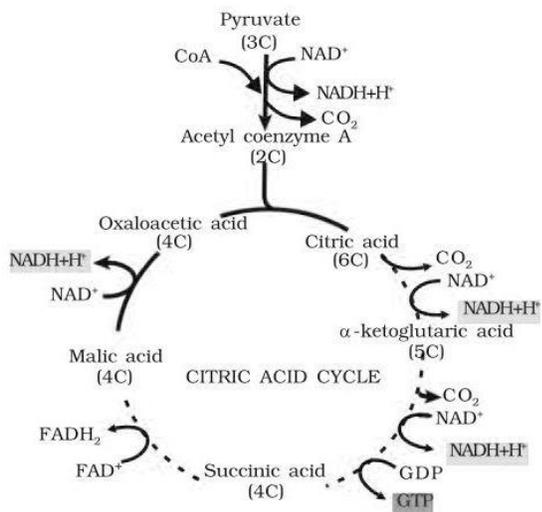
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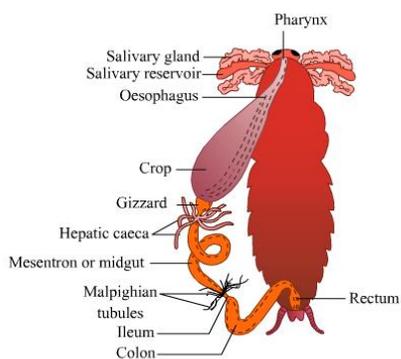
OR

The TCA cycle starts with the condensation of acetyl group with oxaloacetic acid (OAA) and water to yield citric acid . The reaction is catalysed by the enzyme citrate synthase and a molecule of CoA is released. Citrate is then isomerised to isocitrate. It is followed by two successive steps of decarboxylation, leading to the formation of α-ketoglutaric acid and then succinyl-CoA. In the remaining steps of citric acid cycle, succinyl-CoA is oxidised to OAA allowing the cycle to continue. During the conversion of succinyl-CoA to succinic acid a molecule of GTP is synthesised. This is a substrate level phosphorylation. In a coupled reaction GTP is converted to GDP with the simultaneous synthesis of ATP from ADP. Also there are three points in the cycle where NAD⁺ is

reduced to $\text{NADH} + \text{H}^+$ and one point where FAD^+ is reduced to FADH_2 . The continued oxidation of acetic acid via the TCA cycle requires the continued replenishment of oxaloacetic acid, the first member of the cycle. In addition it also requires regeneration of NAD^+ and FAD^+ from NADH and FADH_2 respectively.



26



5

OR

