

SECTION A (40MARKS)

1	A	6	B	11	B	16	C	21	A	26	B	31	D	36	D
2	C	7	D	12	C	17	C	22	A	27	Free	32	D	37	A
3	C	8	A	13	D	18	A	23	D	28	C	33	C	38	B
4	A	9	C	14	D	19	D	24	B	29	B	34	C	39	B
5	C	10	B	15	B	20	B	25	C	30	B	35	A/B	40	C

SECTION B

41 (a) i)

- allows some substances to pass across it and prevents others;
- Permits passage of different substances at different rates;
- Allows different substances to cross it at different times;

(ii) the membrane consists of a dynamic fluid bilayer of phospholipids; containing free floating proteins; arranged in an irregular pattern;

(b)

- Isolation of enzymes so that other organelles are not damaged;
- Efficient regulation of metabolic pathway;
- Offers large surface area for reactions;
- Isolating different chemical reactions to prevent interference;
- Different metabolic activities can take place at the same time;
- Acts as an intracellular transport system;

c) ribosomes; centrioles; microtubules; microfilaments;

42 (a) is the loss of the specific 3D shape of the protein molecule; due to breakage of bonds that hold it in shape;

(b) (i)

- remains active over a wide range of Ph media;
- Enzyme A optimally catalyzes reactions in different Ph media;

(ii)

- Enzyme B is denatured beyond the optimum Ph and at low Ph;
- Enzyme B works best at an optimum pH;
- Enzyme B works over a narrow pH range;

(iii) positively charged ions combine with COO^- part of the amino acid; disrupting ionic bonds; destroying the shape of the protein; **OR** negatively charged ions combine with the NH_3^+ group of the amino acid; disrupts ionic bonds; distorting the shape of the protein;

43. (i)

Mass flow	Cytoplasmic streaming
passive	Active;
unidirectional	Bidirectional;
Materials move as a result of pressure gradient	Materials move as a result of cytoplasm movement;

(ii)

- hydrostatic pressure gradient between two points;
- Presence of a continuous pathway for flow of solutes and water;
- Addition of solute at the source and their removal at the sink;

(b) (i) the endodermis actively secretes salts into the vascular tissues; allowing water to be drawn into the by osmosis; the casparian strip in the endodermis prevents outward leakage of salts from the vascular tissues;

(ii) these link the cytoplasm of one cell to another; allowing movement of materials from one cell to another;

44 (a) taxis is the movement of the whole organism in response to a directional stimulus whereas kinesis is the movement of a whole organism in response to a non-directional stimulus;

(b) enables organisms to solve new problems; by adapting to previous experiences;

Involves intelligence; minimizing time that would be spent on trial and error;

c) i) are used to mark; and identify; boundaries e.g., dogs/cats urinating on gate posts;

(ii) increases the levels of aggression; in males so as to defend their territories; e.g., threat displays;/drumming in wood peckers.

45.a) a meristem is a group of cells which retain the ability to divide mitotically; to produce daughter cells that differentiate into new tissues of the plant;

b) a reduction in a day length; which results into accumulation of growth inhibitors/ abscisic acid;

shortage of growth promoters like auxins and GA;

c) the vascular cambium divides; to form secondary xylem; that becomes lignified; to form dense woody tissue that provides mechanical support; as the plant grows;

(d) enables the root to increase in length to obtain water and mineral salts; and the shoot to increase in length and access light for photosynthesis;

46 (a) continuous variation is where individuals show a complete gradation from one extreme to the other; while discontinuous variation is where individuals show clear cut differences with no intermediates between them;

(b) i) is due to combined effect of many genes/polygenes; which are influenced by the environment;

(ii) controlled by one or few genes;

(c) due to selective breeding; the same alleles are passed from one generation to another;

(d) there is reduction in variations of alleles; which leads to increased homozygosity;/ expression of harmful recessive alleles; this leads to loss of vigor, size and fertility;

END (KDR 24')