JINJA JOINT EXAMINATIONS BOARD

MOCK EXAMINATIONS JULY/AUGUST 2024

P530/1 - A LEVEL BIOLOGY PAPER ONE P530/1 THEORY

PROPOSED MARKING GUIDE 2024

SECTION A

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

SECTION B

41. (a) Presence/ contact of food with stomach wall stimulates/causes; stomach wall to secrete gastrin hormone; which stimulate the gastric glands to secret gastric juice; rich in hydrochloric acid which lowers pH of the stomach contents;

Acc. Oxyntic/parietal cells which secrete HCl; which lowers the PH;

@ ½ mark (maximum 2 marks)

(b) (i) ~~Inactive~~ HCl; in gastric juice; activates conversion of pepsinogen into pepsin; ~~this decreases amount of pepsinogen and increases amount of pepsin~~;

@ ½ mark (maximum 2 marks)

(II) Pepsin;

1 mark

(C) Bile juice contains organic salts (sodium taurocholate) which emulsify lipids into small droplet; increasing surface area of lipids; lipase enzyme to act on during chemical digestion;

Inorganic salts (like sodium hydrogen carbonate) neutralize the acidified chyme from stomach; to create optimum conditions for lipase enzyme to catalyse hydrolysis of lipids;

Bile salts mix with fatty acids and glycerol; to form micelles; that can easily diffuse into epithelial cells of lining of duodenum and ileum; facilitating lipid absorption;

@ ½ mark (maximum 5 marks)

42. (a) Skin provides tough physical barrier to the entry of pathogens;

Skin has sebaceous glands that secret sebum that kills pathogens;

Tears/ mucus/ saliva and sweat contain chemicals that inhibit growth of microorganisms. ;

Or. (Parts not covered with skin like eyes, nose and mouth secret fluids like tears, nasal secretions and saliva containing lysozyme enzyme that immobilizes pathogens)

Air passage linings have cilia and mucus that trap pathogens in air. ;

Hydrochloric acid in gastric juice kills most pathogens that gets as far as the stomach;

Forming blood clots at sites of wounds prevents entry of pathogens;

Coughing and sneezing expel pathogens from the breathing tract;

Vomiting and diarrhea expel pathogens from the gut;

Phagocytes like macrophages and neutrophils in clots at sites of wounds engulf pathogens and kill them;

@1 mark (maximum 6 marks)

(b) Fibrinogen is a soluble plasma protein that is converted to insoluble (solid) threads of fibrin by thrombin enzyme;

Fibrin threads form meshwork ;which traps proteins and blood cells to form a blood clot; The clot prevents further blood loss from a wound; and forms a mechanical barrier to the entry of the pathogens;.

@ ½ mark (maximum 4 marks)

43 (a) Promote growth of stems by increasing the length of internodes;

Stimulate seed germination and seedling growth;

Break seed dormancy;

Promote fruit development and expansion;

Promote flowering in long day plants and inhibit flowering in short day plants;

ANY 2 @ 1 mark (maximum 2 marks)

(b) Light causes auxins(IAA) to diffuse to shaded side of shoot tip; IAA increases the rate of cell division and facilitate cell expansion on the dark side of the plant shoot;

IAA cause cell walls of cells on the dark side to be more permeable to water; and easily stretched by the turgor pressure that develops in the cell vacuoles;

Cells elongate faster due to higher turgor pressure; cells on dark side grow faster causing shoot to bend towards light;

@ ½ mark (maximum 4 marks)

(c) Seed absorbs water; activating seed embryo to secrete gibberellins(GA);

GA diffuse into aleurone layer; where it stimulates secretion of a mixture of/many enzymes like amylase; These enzymes diffuse into endosperm with food reserves; catalyzing hydrolysis of large insoluble food storage molecules like starch into simple/ smaller soluble molecules; that can be transported to the growing parts of the embryo; (Where they can be used for respiration to generate energy for growth or synthesis of structures for growth)

@ ½ mark (maximum 4 marks)

44 (a) Maintain constant supply of glucose for respiration to vital organs/ tissues e.g. brain/heart;

Maintain optimal osmotic potential of blood for normal functioning of blood cells.;

To prevent disorders related to hyperglycaemia and hypoglycaemia;

ANY 2 @ 1 mark (maximum 2 marks)

(b) Converting glucose to glycogen reduces/lowers glucose concentration in liver cells; glucose concentration in liver cells fall below that in blood; creating a steep diffusion/ concentration gradient between blood and inside liver cells;

This causes more; glucose to diffuse from blood into liver cells by facilitated diffusion; reducing amount of glucose in blood;

@ ½ mark (maximum 4 marks)

(C) Diabetic individuals fail to produce insulin hormone; needed to reduce blood glucose; Blood glucose concentration increases resulting into increased glucose in glomerular filtrate;

All channel and carrier proteins in (proximal convulated tubules of) kidney nephron; are saturated with glucose molecules; and not all glucose are reabsorbed into blood; the unabsorbed glucose molecules continue in glomerular filtrate/renal fluid; to the pelvis of kidney to form urine;

@ ½ mark (maximum 4 marks)

45 (a) Primary succession starts (is the gradual colonization of) a previously unoccupied area like a bare rock/bare ground; starting with organisms called pioneers and progresses to form a climax community;

@ 1 mark (maximum 2 marks)

(b) Their roots penetrate deeper into soils helping in biological weathering of soil;

They trap water improving on water content of soil;

When they die they add humus to soil;

Form microhabitats/shelters for microorganisms/soil organisms;

Hold soil particles preventing soil erosion;

Release more minerals or nutrients into soil; Humus.

~~Some fix nitrogen into soil;~~

Change soil pH;

ANY 3 @ 1 mark (maximum 3 marks)

(C) Grazing by livestock or animals prevents grasslands to proceed to form a climax community;

Burning of bushes kills microorganisms and plants;

Mowing/slashing of lawns/ grasses;

Application of fertilizers may favour certain plant species;

Application of selective herbicides killing particular plant species;

ANY 2 @ 1 mark (maximum 2 marks)

(d) Biomass increases; plants like mosses and ferns; in early stages of succession are small with reduced photosynthetic activities; building little organic matter but in later stages tree plants like shrubs are bigger and woody ;with higher photosynthetic activities building much organic matter increasing the biomass;

@ ½ mark (maximum 3 marks)

46. (a) (i) A arteries; B arterioles; C capillaries; D Venules; E veins; 2½.

@ ½ mark (maximum 2 ½ marks)

(ii) Acc. Arteries

Arterioles; (have highest proportion of muscle tissue) to easily contract and reduce arteriole lumen to drastically reduce blood pressure enabling them to control flow to tissues; 01.

@ ½ mark (maximum 1 mark)

(b) (i) vessels close to heart; receiving blood from contracted ventricle at a very high blood pressure; causing the arteries to distend/ stretch dropping the blood pressure; elastic layer in walls of arteries recoil increasing blood pressure; 02

@ ½ mark (maximum 2 marks)

(ii) Many arteries with increased total cross sectional area; increase frictional resistance from the increased area of blood vessel wall; reducing blood flow and pressure;.

@ ½ mark (maximum 2 marks)

(iii) Veins have wider lumens; reducing resistance to blood flow; and contraction of skeletal muscles squeeze increases speed of blood flow in veins;

@ 1 mark (maximum 2 marks)

(C) Blood flow is slower with increased total cross sectional area; to allow more time for exchange of materials between blood in capillaries (blood vessels) with surrounding tissues;

@ 1 mark (maximum 2 marks)

END