BIOLOGY PAPER 1 UNEB 2022 GUIDE

SECTION A

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

SECTION B

41 (a)**.** This is the existence of several genes on the same chromosome; which are inherited together;

b (i), both alleles are equally expressed in the phenotype;

(ii) the F2 produces phenotypes in the ratio 1:2:1; instead of 3:1 ratio with one for each parent and two for the intermediates;

(c). The F2 fails to produce the 9:3:3:1 phenotypic ratio; but instead produces 3:1 ratio; as the alleles do not independently assort; however a smaller number of individuals with new gene combinations/recombinants may be produced; as crossing over occurs;

42 (a) long day plants are plants which flower only when the day length exceeds a critical value with in each 24hour period; whereas short day plants are those that flower when the critical day length is less than the critical value;

b(i) when P_R (P_{660}) absorbs red light, it is rapidly converted into P_{FR} (P_{730}); accumulation of P_{FR} (P_{730})/ low concentration of P_R (P_{660}) causes the release of florigen; which initiates flowering;

(ii) this causes the conversion of P_R (P_{660}) into P_{FR} (P_{730}); which promotes flowering;

(c)

- allows plants growing under the canopy to flower early before the canopy develops;
- Enables temperate plants to produce fruits before harsh winter conditions set in;
- Permits cross breeding as plants of the same species flower in the same season;
- Keep some plants in a vegetative growth where they can store large amounts of food;

43 (a)

- urine has no proteins since they are large and do not filter across the glomeruli;
- Urine has no glucose since it is all reabsorbed back into blood;
- Urine has more water due to low reabsorption/reabsorption of other solutes;
- Urine has more urea due to active secretion by tubular cells/ low reabsorption;
- Urine has more chloride ions due to low reabsorption;

(b)(i) urine will be more concentrated/hypertonic; since more water is lost in sweat;

(ii) urine will have higher concentration of urea; due to deamination of excess amino acids;

(c)

- has numerous micro villi to increase surface area for reabsorption;
- Has numerous mitochondria to produce energy for active transport;
- Has infoldings of the basal membrane to form basal channels that increase surface area for reabsorption;
- Presence of carrier proteins in the membrane for transporting materials;

44. cause immediate and rapid secretion of gastric juice; reaching the peak of secretion in 30 minutes; the secretion of gastric juice decreases rapidly; to zero after one hour

The effect of nervous control is short lived

(b) (i)

Nervous control	**Hormonal control**
Increases rapidly to peak	Increases gradually to peak;
Higher maximum secretion	Lower maximum secretion;
Short lived	Long lived;
Rapid decrease after peak	Gradual decrease after peak;
Attains peak earlier	Attains peak later;

(ii) rapid increase in gastric juice secretion due to fast transmission of impulses; while gradual increase in hormonal control is due to slow secretion of gastrin hormone/transport of gastrin hormone through blood stream;

Nervous control is short lived because transmission is specific to the effectors; while the hormonal control effect is wide spread/ takes time to inactivate hormones;

45 (a) photosynthetic bacteria use light as a source of energy; chemosynthetic bacteria obtain energy from oxidation of inorganic compounds;

(b) have bacteriochlorophyll; which exists in two forms (purple and green); which absorbs light of different wavelength; increasing absorption spectrum;

(c) nitrifying bacteria; release energy from oxidation of inorganic materials; which is used to synthesize carbohydrates; Their reactions cause recycling of nutrients;

46 (a) when exposed to the same antigen, memory cells; produce large quantities of antibodies; which rapidly destroy the pathogen

(b) (i) secrete wax (cerumen) which traps pathogens;

Presence of hair trap dirt and bacteria;

(ii) presence of sphincter muscles which close the anus;

(c) contain lymphocytes; which trap and remove pathogens from lymph;

(d)

- prevent entry of pathogens;
- Detect presence of pathogens by distinguishing them from the animal's own body cells;
- Destroy pathogens in the body;
- Produce antibodies to prevent reinfection from the same pathogen;

END