Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
(TAKE HOME)
SEMESTER I
SESSION 2020/2021

COURSE NAME	:	ECOLOGICAL DYNAMICS
COURSE CODE	:	BWJ 30603
PROGRAMME CODE	:	BWW
EXAMINATION DATE	:	JANUARY / FEBRUARY 2021
DURATION	:	3 HOURS 30 MINUTES
INSTRUCTION	:	ANSWER **ALL** QUESTIONS **OPEN BOOK EXAMINATION**

THIS QUESTION PAPER CONSISTS OF **SIX (6)** PAGES

Q1 (a) **Figure Q1(a)** shows different types of data in ecological study. Identify the types of data for A, B, C, and D.

(4 marks)

(b) Arrange the data in **Figure Q1(a)** from the weakest to the strongest level of measurement.

(2 marks)

(c) Referring to **Figure Q1(a),** differentiate A, B, C, and D by giving **ONE (1)** point of comparison for each of the provided data.

(8 marks)

(d) If you want to conduct research on demographics, which data will you use? A, B, C, or D? Why?

(4 marks)

(e) There are several types of experiments in ecological study. State **ONE (1)** type of experiment that you don't have the power of control over the experiment.

(2 marks)

Q2 (a) By using an illustration, present a detailed classification of the river ecosystem.

(12 marks)

(b) Determine A, B, C, D, and E in **Figure Q2(b)**.

(5 marks)

(c) Good soil has several characteristics. Draw and explain the structure of good soil.

(3 marks)

Q3 (a) Birds that live in the arctic environment have a higher tendency of freezing. By illustrating, identify and explain the mechanism birds used to prevent them from being frozen.

(10 marks)

(b) Name the process that occurred in **Figure Q3(b)**. Explain in detail the process that occurred and determine **TWO (2)** products formed from this process.

(10 marks)

Q4 (a) State **THREE (3)** types of the food web and compare **ONE (1)** characteristic of these food webs.

(9 marks)

(b) *"Decomposition is defined as the physical and chemical breakdown of dead plant and animal biomass by decomposers"*. Explain decomposition processes in **Figure Q4(b)**.

(6 marks)

(c) "*Two copies of gene segregate from each other during transmission from parent to offspring*".

(i) What law supports the above statement?

(1 mark)

(ii) By using illustration, predict what happens to F1 and F2 generation when Mendel crossed true-breeding purple and white-flowered plants.

(4 marks)

Q5 (a) A static life table is used by the ecologist to gather data on the age structure of a given population at one point in time. Based on **Table Q5(a)**:

(i) Calculate the number of deaths in the age class (6-7) years.

(3 marks)

(ii) Calculate the mortality rate for the age class (10-11).

(3 marks)

(b) State **FOUR (4)** hypotheses that suggest the causes of spatial and temporal patterns of biodiversity.

(4 marks)

(c) Landscape ecology is the field of study that examines the spatial arrangements of elements in populations and communities. Good landscape ecology considers factors such as size, number, proximity, connectivity, and buffer zones in designing a nature reserve. Imagine you are one of the environmental planners responsible for designing a nature reserve, by using illustration, explain how you can design good nature reserves by considering all the factors mentioned.

(10 marks)

– **END OF QUESTIONS** –

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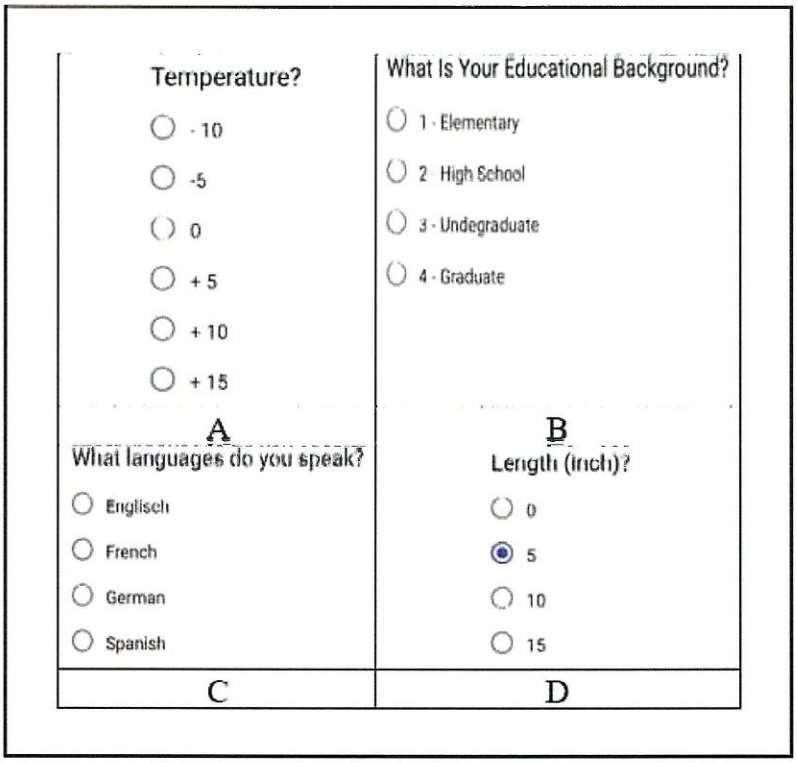

Figure Q1(a)

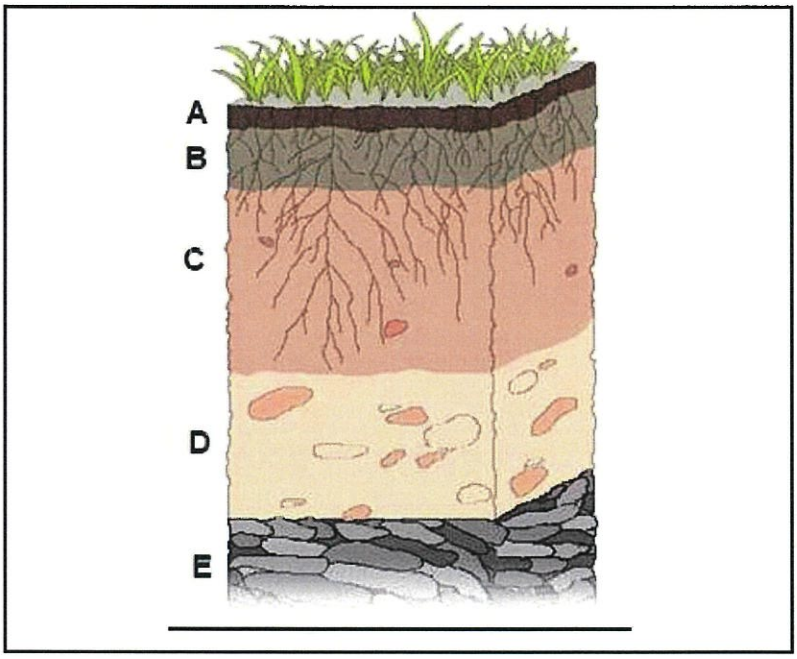

Figure Q2(b)

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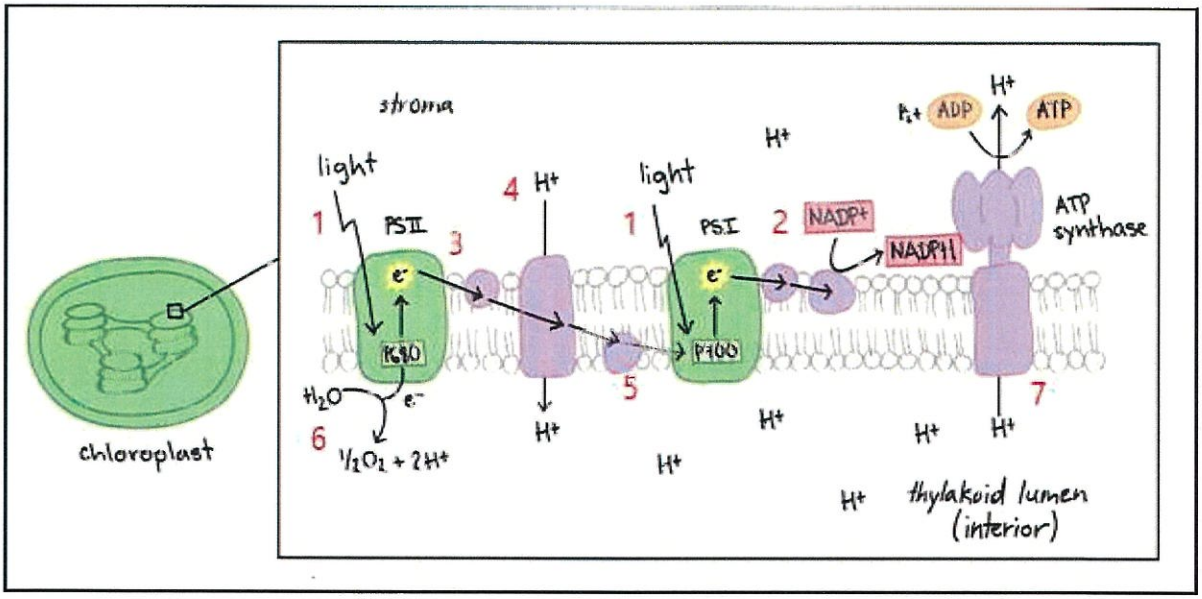

Figure Q3(b)

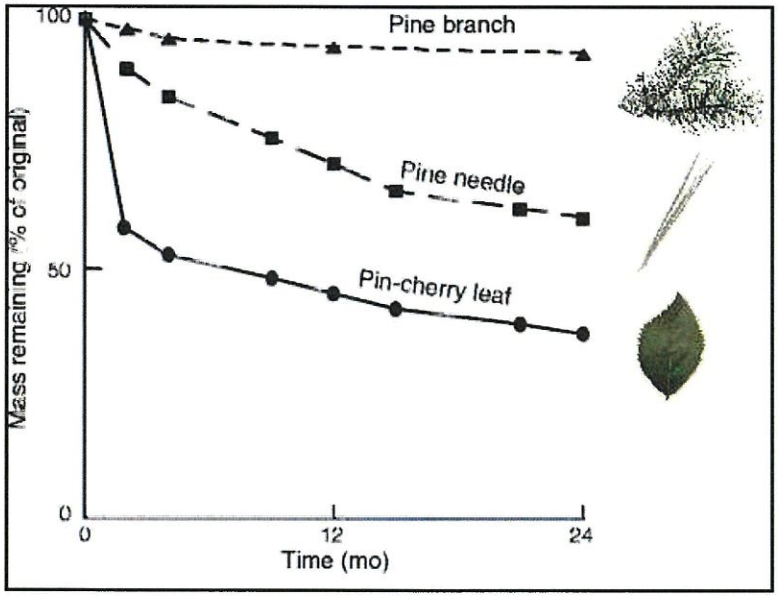

Figure Q4(b)

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Age class	Number alive	Number dying	Mortality rate
0–0.5	1000	54	0.054
0.5–1	946	145	0.1533
1–2	801	12	0.015
2–3	789	13	0.0165
3–4	776	12	0.0155
4–5	764	30	0.0393
5–6	734	46	0.0627
6–7	688	*	0.0698
7–8	640	69	0.1078
8–9	571	132	0.2312
9–10	439	187	0.426
10–11	252	156	*
11–12	96	90	0.9375

Table Q5(a)