Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
(TAKE HOME)
SEMESTER II
SESSION 2019/2020

COURSE NAME	:	MANAGEMENT SCIENCE II
COURSE CODE	:	BPB 20603
PROGRAMME CODE	:	BPA
EXAMINATION DATE	:	JULY 2020
DURATION	:	24 HOURS
INSTRUCTION	:	ANSWER **ALL** QUESTIONS **OPEN BOOK EXAMINATION**

THIS QUESTION PAPER CONSISTS OF **THREE (3)** PAGES

Q1 Southland Corporation's decision to produce a new line of recreational product resulted in the need to construct either the small plant, medium plant or a large plant. The best selection of plant size depends on how the market place reacts to the new product line. To conduct an analysis, marketing management has decided to view the possible long-run demand as either low, medium, or high. **Table Q1** shows the projected profit in millions of Ringgit Malaysia:

Table Q1: Payoff table of Southland Corporation

	Long-Run Demand		
Plant Size	Low, s_1	Medium, s_2	High, s_3
Small, d_1	320	270	170
Medium, d_2	188	205	280
Large, d_3	136	190	450

Furthermore, the management must decide whether to undertake the market research study. If the market research study is conducted, the outcome will either be favorable (F) or unfavorable (U). The following conditional probabilities apply with the market research study outcome and demand:

$P(F) = 0.70$ $P(s_1 \mid F) = 0.34$ $P(s_2 \mid F) = 0.32$ $P(s_3 \mid F) = 0.34$

$P(U) = 0.30$ $P(s_1 \mid U) = 0.20$ $P(s_2 \mid U) = 0.26$ $P(s_3 \mid U) = 0.54$

$P(s_1) = 0.30$ $P(s_2) = 0.30$ $P(s_3) = 0.4$

(a) Determine the decision to be made, and the chance event for the company.

(2 marks)

(b) Construct an influence diagram.

(1 mark)

(c) Construct a decision tree without market research study.

(1 mark)

(d) Recommend decision based on the use of:

(i) Optimistic approach

(1 mark)

(ii) Conservative approach

(2 marks)

(iii) Minimax regret approach

(3 marks)

(e) Determine the optimal decision strategy by considering market research study based on expected value approach.

(15 marks)

Q2 (a) After studying a brand-switching problem, an analyst concluded that Brand A loses 20 percent of its customers each period to Brand B and 10 percent to Brand C. Brand B loses 10 percent of its customers each period to Brand A and 30 percent to Brand C. Brand C loses 30 percent to Brand A and 20 percent to Brand B.

Tabulate the matrix of transition probabilities.

(5 marks)

(b) A rural community has two television stations, and each Wednesday night the local viewers watch either the Wednesday Movie or a show called Western Times. **Table Q2(b)** shows the transition matrix which contains the probabilities of a viewer's watching one of the shows in a week, given that he or she watched a particular show the preceding week.

Table Q2(b): Transition matrix

	Next week	
This week	Wednesday Movie	Western Times
Wednesday Movie	0.75	0.25
Western Times	0.45	0.55

(i) Compute the steady-state probabilities.

(15 marks)

(ii) Assume that the community contains 1,200 television sets.

Compute the number of television sets tuned to each show in the long run.

(4 marks)

(iii) A prospective local sponsor wanted to pay for commercial time on one of the shows.

Determine which show would more likely be selected.

(1 mark)

-END OF QUESTIONS-