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Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER II
SESSION 2015/2016**

COURSE NAME : ENGINEERING MANAGEMENT
COURSE CODE : BEE 30103
PROGRAMME : BEJ/ BEV
EXAMINATION DATE : JUNE / JULY 2016
DURATION : 3 HOURS
INSTRUCTION : ANSWER ALL QUESTIONS

THIS QUESTION PAPER CONSISTS OF FIVE (5) PAGES

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- Q1** (a) Total Quality Management (TQM) is an enhancement to the traditional way of management method.
- (i) Define TQM as an organization's culture. (2 marks)
 - (ii) Explain **SIX (6)** underlying principles of TQM. (6 marks)
 - (iii) Discuss **FOUR (4)** obstacles associated with TQM implementation. (8 marks)
- (b) Describe SWOT analysis. (6 marks)
- (c) Discuss a conceptual, interpersonal and technical skills and their relevance for managers. (3 marks)

Q2 Table 1 shows the weekly sales for the number of gallons of deck sealer at the local hardware store during the spring months and the smoothing values for a 4-point moving average and simple exponential method with α of 0.2.

Table 1: Sales for the number of gallons of deck sealer

Week	Gallon Cans Sold	Moving average (4)	SES ($\alpha = 0.2$)
1	106		
2	110		
3	108		
4	97		
5	210		
6	136		
7	128		
8	134		

- (a) Calculate a simple moving average with a length of 4 for the sales. Redraw and fill in Table 1. (5 marks)
- (b) Using the 4-point moving average, calculate the forecast sales for week 9. (2 marks)
- (c) Find the simple exponential smoothing (SES) factor using α of 0.2. The initial starting value is 106. Fill in Table 1. (7 marks)
- (d) Using the exponential smoothing factor with α of 0.2, determine the forecast error for week 6? Calculate the absolute percentage error for week 6. (6 marks)
- (e) Based on answer obtained in **Q2(a)** and **Q2(c)**, examine and explain which forecast provides the better responsive and stability. (5 marks)

- Q3**
- (a) Compare and contrast the project evaluation and review technique (PERT) with the critical path method (CPM). (6 marks)
 - (b) Using the information in Table 2, assuming the project team will work a standard working week (5 working days in 1 week) and that all tasks will start as soon as possible.

Table 2: Working project team

Task	Description	Duration (Working Days)	Predecessor/s
A	Requirement Analysis	5	
B	Systems Design	15	A
C	Programming	25	B
D	Telecoms	15	B
E	Hardware Installation	30	B
F	Integration	10	C,D
G	System Testing	10	E,F
H	Training/ support	5	G
I	Handover and Go-Live	5	H

- (i) Visualise the critical path of the project. (5 marks)
- (ii) Calculate the planned duration of the project in weeks. (4 marks)
- (iii) Identify any non-critical tasks and determine the float (free slack) on each. (4 marks)
- (iv) Construct a Gantt Chart to illustrate the timeline. (6 marks)
- Q4** (a) Describe with an example, the **FOUR (4)** types of quality costs. (4 marks)
- (b) Discuss **FOUR (4)** main elements of reliability. (4 marks)
- (c) Explain the differences between breakdown and preventative maintenance. (6 marks)
- (d) Two hundred units of a particular component were subjected to accelerated life testing equivalent to 2,500 hours of normal use. One unit failed after 1,000 hours and another after 2,000 hours. All other units were still working at the conclusion of the test. Calculate the failure rate per hour. (4 marks)
- (e) Due to the extreme cost of interrupting production, a manufacturer has two standby machines available in case a particular machine breaks down. The machine in use has a reliability of 0.94, and the backups have reliabilities of 0.90 and 0.80. In the event of a failure, a backup machine is brought into service. If this machine also fails, the other backup is used. Visualize the network diagram and determine the system reliability. (7 marks)

- END OF QUESTIONS -

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LIST OF FORMULA

$$MA_n = \frac{\sum_{i=1}^n A_i}{n}$$

$$F_{t+1} = \alpha D_t + (1 - \alpha)F_t$$

$$e_t = A_t - F_t$$

$$AF_{t+1} = F_{t+1} + T_{t+1}$$

$$MAD = \frac{\sum_{t=1}^n |A_t - F_t|}{n}$$

$$MSE = \frac{\sum_{t=1}^n (A_t - F_t)^2}{n}$$

$$RMSE = \sqrt{MSE}$$

$$b = \frac{\sum xy - n\bar{x}\bar{y}}{\sum x^2 - n\bar{x}^2}$$