UTHM

Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2018/2019

COURSE NAME	:	INDUSTRIAL AUTOMATION
COURSE CODE	:	BPC 41203
PROGRAMME CODE	:	BPB
EXAMINATION DATE	:	JUNE / JULY 2019
DURATION	:	3 HOURS
INSTRUCTION	:	ANSWER **ALL** QUESTIONS

THIS QUESTION PAPER CONSISTS OF **FOUR (4)** PAGES

Q1 (a) Describe **TWO (2)** levels for automation control.

(4 marks)

(b) Explain **THREE (3)** factors of customer expectation of a product.

(6 marks)

(c) Explain an automation and control technologies in the production systems with appropriate illustration.

(15 marks)

Q2 (a) State **FIVE (5)** benefits of Automated Production Systems.

(5 marks)

(b) Describe the following with appropriate illustration.

(i) Automation in manufacturing system.

(5 marks)

(ii) Computerization of the manufacturing support systems.

(5 marks)

(c) State **FIVE (5)** requirements to apply the automation process in the product manufacturing.

(10 marks)

Q3 The logic circuit shows as in **Figure Q3.**

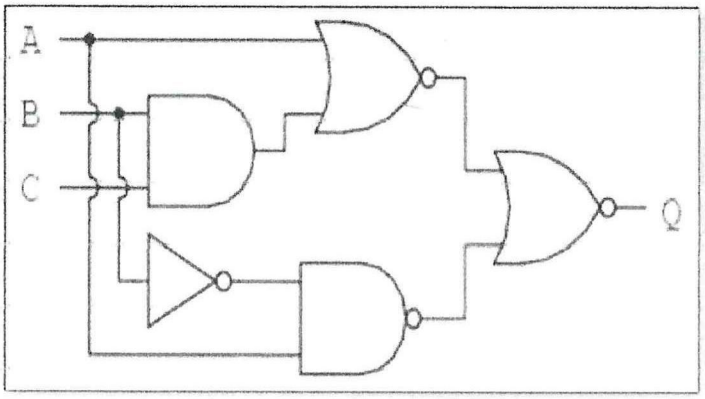

Figure Q3: Logic Circuit

(a) Determine the output (Q) based on **Figure Q3**.

Table Q3: Logic Circuit Input/Output

INPUT			OUTPUT
A	B	C	Q
0	0	0	
0	0	1	
1	0	0	
1	1	0	
1	0	1	

(10 marks)

(b) Analyze the output of the logic circuit in **Figure Q3** with a simple expression using Boolean Algebra theory, if each input signal was "A, B, C".

(15 marks)

Q4 The worktable of a positioning system is driven by a leadscrew whose pitch is 5.0 mm. The leadscrew is connected to the output shaft of a stepper motor through a gearbox with ratio 5:1 (five turns of the motor to one turn of the leadscrew). The stepper motor has 45 step angles. The table must move a distance of 250 mm/min from its present position at a linear velocity of 500 mm/min.

Calculate:

(a) Angle of leadscrew rotation.

(5 marks)

(b) The number of pulses to move the table.

(10 marks)

(c) Table travel speed (f_p).

(10 marks)

- END OF QUESTIONS -