Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER I
SESSION 2017/2018

COURSE NAME	: INDUSTRIAL AUTOMATION
COURSE CODE	: BPC 41203
PROGRAMME CODE	: BPB
EXAMINATION DATE	: DECEMBER 2017 / JANUARY 2018
DURATION	: 3 HOURS
INSTRUCTION	: ANSWER **ALL** QUESTIONS

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

Q1 (a) Describe an automation in manufacturing industry.

(5 marks)

(b) State **FIVE (5)** advantages of automation production lines.

(5 marks)

(c) Illustrate the chart of an automation and control technologies in the production systems with appropriate explanation.

(15 marks)

Q2 (a) Describe the following the segmented in-line configuration of an automated production line:

(i) L shaped.

(5 marks)

(ii) U shaped.

(5 marks)

(b) A rotary worktable is driven by a Geneva mechanism with six slots designed. The driver rotates at 30 rev./min.

Calculate:

(i) Cycle time.

(3 marks)

(ii) Angle of rotation.

(4 marks)

(iii) Available service time.

(4 marks)

(iv) Indexing time.

(4 marks)

Q3 **Table Q3** shows the output of Logic circuit as in **Figure Q3.**

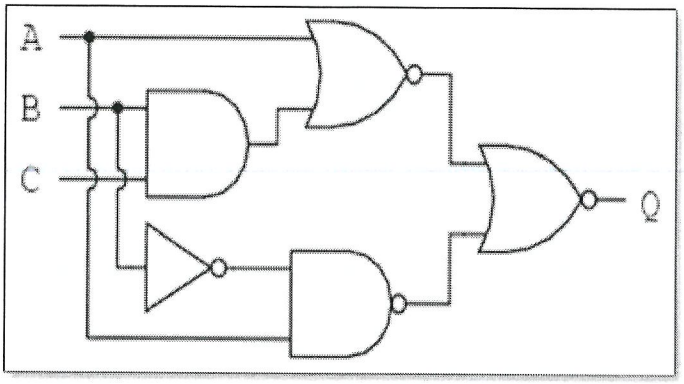

Figure Q3: Logic Circuit

Based on **Figure Q3:**

(a) Define the Output

Table Q3: Logic Circuit Output

INPUT			OUTPUT Q
0	0	0	
1	0	0	
1	1	0	
0	1	0	
1	1	1	

(10 marks)

(b) Analyse to the simple expression using Boolean Algebra.

(15 marks)

Q4 The worktable of a positioning system is driven by a lead screw connected to a step pin g motor and pitch of lead screw is 4.0 mm. The output shaft of a stepper motor through a gearbox with ratio is 5:1 (five turns of the motor to one turn of the lead screw). The number of stepper motor has 50 step angles. The table must move a distance of 280 mm from home position with linear direction velocity is 500 mm/min.

Calculate:

(a) Angle of lead screw rotation.

(b) The number of pulses required.

(c) The rotational speed.

(d) The motor speed.

(e) The pulse rate.

(25 marks)

- END OF QUESTION -