UNIVERSITY COLLEGE TATI (UCTATI)

FINAL EXAMINATION QUESTION BOOKLET	
COURSE CODE	: BMT 2103 6/1
COURSE	: ELECTRO PNEUMATIC
SEMESTER/SESSION	: 1 - 2024/2025
DURATION	: 3 HOURS

Instructions:

1. This booklet contains 4 questions. Answer **ALL** questions.
2. All answers should be written in answer booklet.
3. Write legibly and draw sketches wherever required.
4. If in doubt, raise your hands and ask the invigilator.

DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO

THIS BOOKLET CONTAINS 7 PRINTED PAGES INCLUDING COVER PAGE

QUESTION 1

a) State three (3) element inputs for the electro pneumatics system. (6 marks)

b) 24VDC is the electrical power supply for the electro pneumatic laboratory. State the three main parts of the 24VDC power supply. (6 marks)

c) Describe the function of the Proximity Inductive sensor, the diagram can be used to illustrate an example of its function. (6 marks)

d) Figure1 shows the symbol of a relay. Describe the function of this relay.

(9 marks)

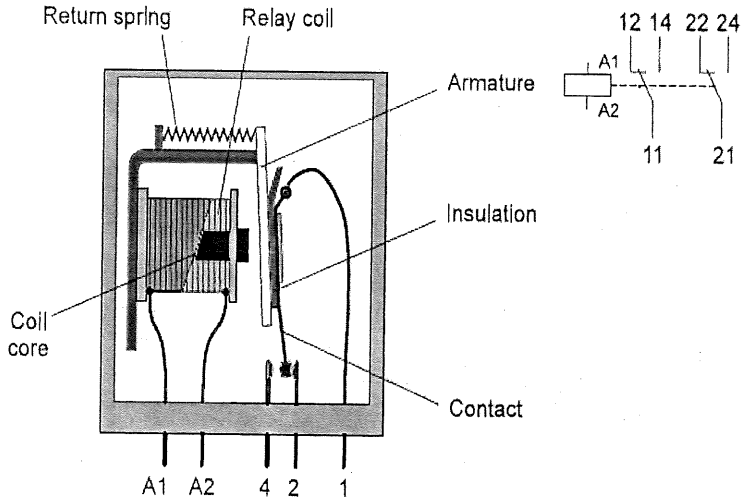

Figure 1

e) Draw the symbol of Counter relay and describe the function of counter relay.

(9 marks)

QUESTION 2

a) Describe three (3) processes involve in development of a control system for electro pneumatic system. (9 marks)

b) Describe three (3) main purpose of commissioning for electro pneumatic system. (9 marks)

QUESTION 3

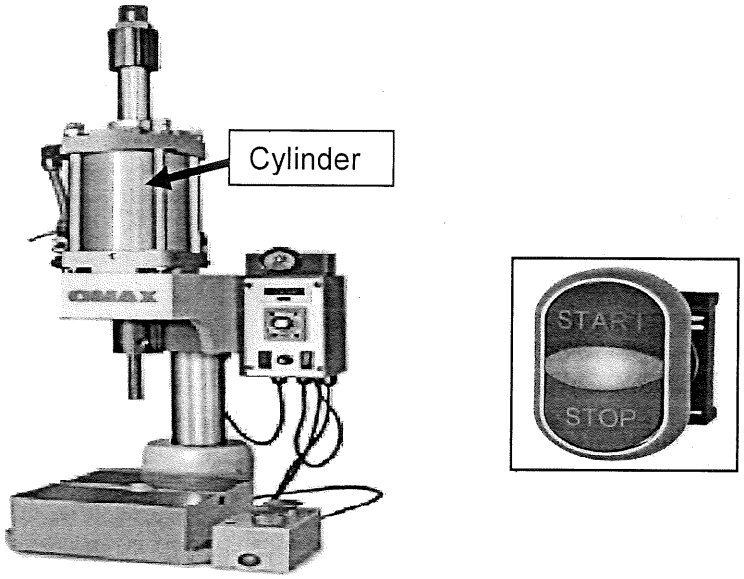

Figure 2

a) Figure 2 show electro pneumatic press machine. When the START Switch is activated the cylinder will go to the extend position and remain in the extend position even if the START switch is no longer activated. The cylinder will only go to the retract position when the STOP switch is activated.

i) Produce an electro pneumatic circuits for the above problems. (9 marks)

ii) Sketch one AND function circuit (PB1 AND PB2) to replace the START switch, to start ON this machine. (2 marks)

b) Figure 3 shows, the piston rod of a double acting cylinder 1 is to extend, when three of normally open pushbuttons **(PB1 AND PB2 AND PB3)** are actuated and will only retract when the fully extend position of a double acting cylinder is reached, which detected by a normally open Roller Limit switch (RLSW1**) AND**, after **20 seconds** extension of fully extension of cylinder.

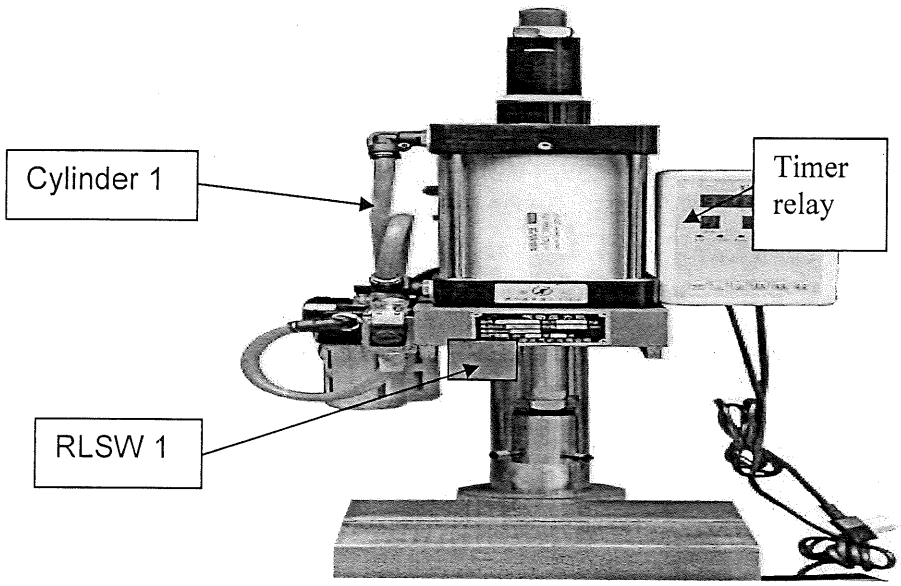

Figure 3

Hint: 5/2 way double solenoid valve should be used

i) Produce an electro pneumatics circuits for the above problems. (10 marks)

ii) Explain the circuit operation (7 marks)

QUESTION 4

Figure 4 represents 2 cylinders (A and B), Figure 5 represents the movements of these two cylinders. When START PB is activated, the cylinder movement will follow the sequence as shown in figure 5. This sequence of movements continues until STOP PB is activated to stop all movements.

i) Produce electro pneumatic circuits for the above problems. (10 marks)

ii) Explain the above circuit operation. (8 marks)

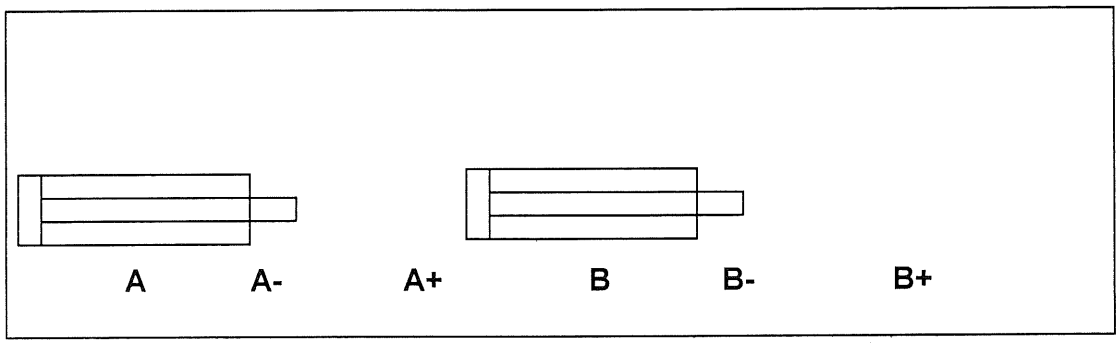

Figure 4

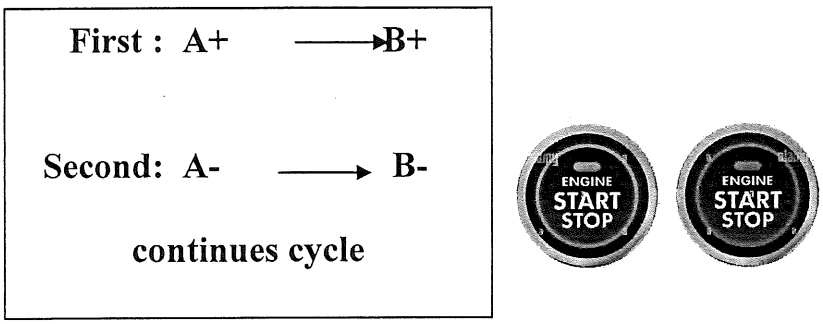

Figure 5

----------End of Question----------

ATTACHMENT: