Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

V SEMESTER B. TECH (MECHANICAL ENGG.) END SEMESTER EXAMINATIONS, DECEMBER 2019

SUBJECT: FLUID DRIVES AND CONTROL [MME 4017]

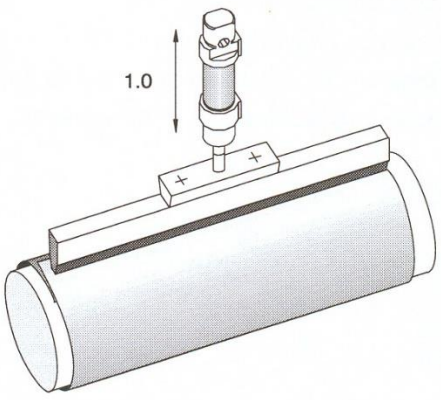
REVISED CREDIT SYSTEM

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

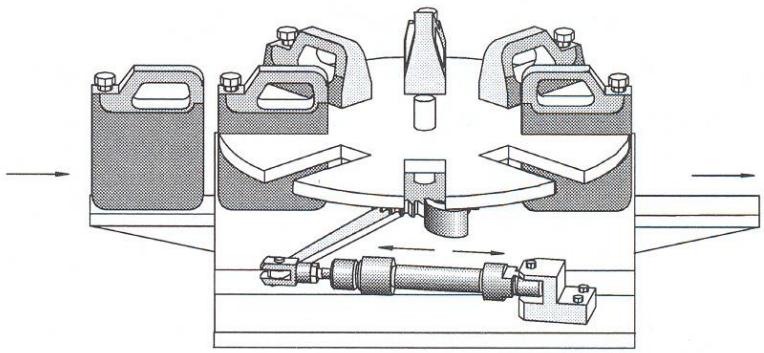
- Answer ALL the questions.
- Missing data may be suitably assumed.
- Draw the sketches neatly and hand writing should be clearly readable

1A)	Explain the structure and signal flow in pneumatic control system	3
1B)	With the help of neat sketch explain the working of shuttle valve	3
1C)	With the help of neat sketch explain the working of air lubricator	4
2A)	Sketch and explain working of quick exhaust valve	3
2B)	Sketch and explain working of 5/2 single pilot direction control valve	3
2C)	Badges are to be produced from a very thin metal sheet. A press with a stamping die is available for this purpose. The double acting cylinder should extend when both the push buttons S1 and S2 are pressed simultaneously. The return stroke is to occur automatically only after the forward end position and preset pressure have been reached to get the consistent quality. The cylinder should immediately retract if emergency push button E is pressed. Write pneumatic circuit for this application.	4



3A) Describe the working of capacitive proximity sensors used in electro pneumatics and also highlight the features of this sensor 3

3B) Using a rotary indexing table plastic containers is to be separated in linear sequence. By pressing a pushbutton switch the oscillating piston rod of a cylinder drives the rotary table in sequence via a pawl. When the push button is pressed again, this drive is switched off. Using 5/2 single solenoid direction control value design the electro-pneumatic control circuit for this application. 3



3C) Explain the working of unloading valves using neat sketch. Also mention symbol for this valve 4

4A) Describe the accessories of power pack used in hydraulic controls system 3

4B) Write the electro-hydraulic circuit to illustrate the use of pressure sequence valve to regulate clamping (A) and bending (B) application in the following sequence A+/B+/B-A-. 3

4C) Sketch and explain the working of gas loaded accumulator and illustrate how it can be used as leakage compensator using appropriate circuit 4

5A) Sketch and explain the working of one way flow control valve 3

5B) Draw symbols for following components 3

i) 4/3 float neutral direction control valve ii) pilot operated check valve

iii) Filter iv) Ram cylinder

v) Compound relief valve vi) Relay

5C) Write the circuit to regulate the speed of hydraulic cylinder using meter-in and meter-out control using electrical components. 4