Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

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

SUBJECT: PNEUMATICS AND HYDRAULICS [MME 3111]

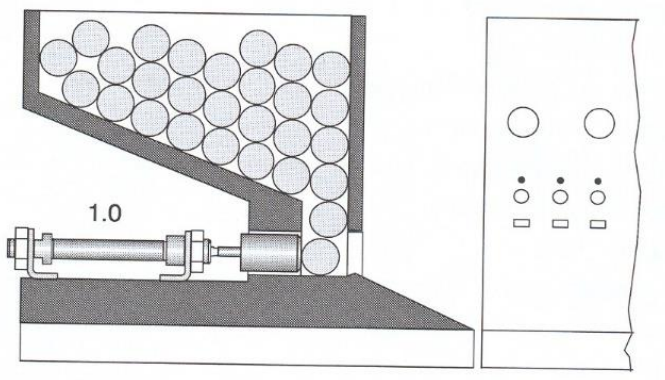
REVISED CREDIT SYSTEM

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

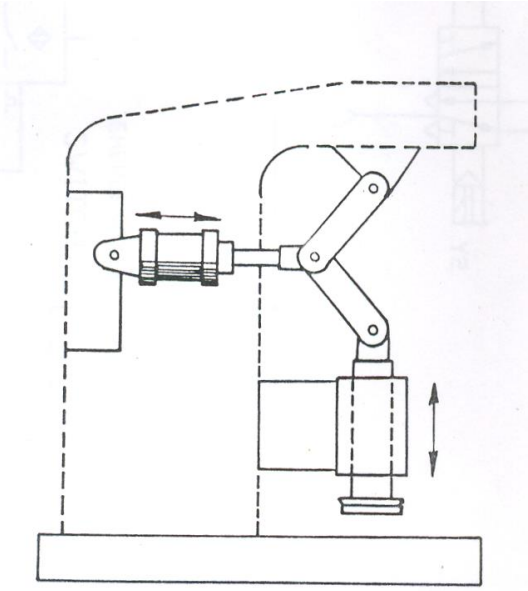
- Answer ALL the questions.
- Missing data may be suitably assumed.
- Draw the sketches neatly and hand writing should be clearly readable

1A)	Explain the structure and signal flow in pneumatic control system	3
1B)	With the help of neat sketch explain the working of AND valve	3
1C)	With the help of neat sketch explain the working of air pressure regulator	4
2A)	Explain working of cylinder cushioning arrangement	3
2B)	Sketch and explain working of 3/2 single pilot direction control valve	3
2C)	A double acting cylinder guides cylinder pins towards a measuring device. The pins are separated by means of a continuous to and fro movement. The oscillating motion can be started by means of a valve with detent switch. The duration of forward stroke and return stroke of the cylinder is to be adjustable. The cylinder is to remain in the forward end position for t = 5 seconds before retraction	4



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

3B) Articles are to be stamped using a stamping device. By pressing two push buttons simultaneously the movable stamping die is pushed down and the article is stamped. After desired pressure is reached the die returns to its initial position even though the push buttons are still pressed. Next cycle should be possible only after the push buttons are released. Write electro=pneumatic circuit for this applications 3



3C) Explain the working of pressure sequence valve using neat sketch 4

4A) What is accumulator and explain the working of any one type of separator type accumulator. 3

4B) Write the electro-hydraulic circuit to illustrate the use of pressure unloading valve to unload the pump flow to tank with any suitable application 3

4C) Write a note fluids used in hydraulic control and list its desirable properties 4

5A) Sketch and explain the working of piston pump 3

5B) Draw symbols for following components 3

i) 4/3 open neutral direction control valve ii) Pressure sequence valve

iii) Rotary pneumatic actuator iv) Rotary hydraulic actuator

v) Counter balance valve vi) Reed switch

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