Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

V SEMESTER B. TECH (IP ENGG.) END SEMESTER EXAMINATIONS, NOVEMBER 2018

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.

1A.	What are the advantages and distinguishing characteristics of compressed air used in pneumatic systems?	**2**
1B.	With the help of a circuit diagram explain the application of a shuttle valve.	**2**
1C.	With a neat sketch explain the working of a one way flow control valve used in pneumatic system.	**3**
1D.	With the help of circuit diagrams explain meter-in retraction and meter-out extension to control the speed of a hydraulic actuator.	**3**
2A.	A plastic component is embossed using a die, powered by a linear actuator. The return of the die is to be effected when the embossing position and a preset pressure is reached. The use of a suitable selector switch causes the control to be switched to continuous cycle. Design a suitable manual pneumatic circuit for the application.	**5**
2B.	Design a manual pneumatic circuit using idle return roller lever valves to achieve the following multiple cylinder sequence: A- B- B+ A+.	**5**
3A.	List and explain the important functions of a hydraulic fluid.	**2**
3B.	With a neat sketch and symbolic representation explain the working of a pneumatic to electric convertor.	**4**
3C.	A station is to be used to check whether the lids (plastic) of cans (metal) are present. If a can without a lid is encountered, it must be pushed aside by a pneumatic cylinder. The lids and cans are to be interrogated by means of sensors. Design a suitable electro pneumatic circuit for the application.	**4**
4A.	Explain the working of a 4/3 direction control valve with the help of its symbolic representation.	**2**
4B.	With the help of a circuit diagram explain the following functions of an accumulator: a) Leakage compensator and b) Auxiliary power source.	**4**
4C.	With a neat sketch explain the working of a hydraulic power pack.	**4**
5A.	With the help of circuit diagram explain the working of counterbalance valve	**5**

in a load carrying vertical cylinder application.

5B. Why is compound pressure relief valve preferred over direct acting pressure relief valve? With a neat sketch explain the working of compound pressure relief valve. **5**