MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
(A constituent unit of MAHE, Manipal)

V SEMESTER B. TECH (IP ENGG.) END SEMESTER EXAMINATIONS, DECEMBER 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 of pneumatic system over hydraulic system?	**2**
1B.	With the help of a circuit diagram explain the application of a quick exhaust valve.	**2**
1C.	With a neat sketch explain the working of a pressure regulator used in pneumatic system.	**3**
1D.	Explain with circuit diagram the regenerative circuit used to increase the extension speed of a double acting hydraulic cylinder.	**3**
2A.	An actuator is used to press together glued components. Upon the actuation the piston slowly advances and returns to its initial position only when it has completely extended and a time of 3 secs has elapsed. The next cycle can start only after 5 secs. Design a suitable manual pneumatic circuit for the same.	**5**
2B.	Design a manual pneumatic circuit using cascade method to achieve the following multiple cylinder sequence: A- B+ B- A+.	**5**
3A.	With the help of a circuit diagram locate the three different types of filters based on its location in the hydraulic system.	**2**
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.	**4**
	Next cycle should be possible only after the push buttons are released. Design a suitable electro pneumatic circuit for the application.	
3C.	With a neat sketch and symbolic representation explain the working of a magnetic reed switch used in pneumatic system.	**4**
4A.	Explain the working of a 3/2 direction control valve with the help of its symbolic representation.	**2**
4B.	A cylinder with a bore diameter of 80 mm and rod diameter of 25 mm is to be used in a hydraulic system with a 60 dm^3/min pump. What are the extension	**4**

and retraction speeds? Determine the output power of the cylinder if it is required to move a 70 kN load during extension.

4C. With a neat sketch explain the working of a radial piston pump. **4**

5A. What is the advantage of pressure compensated flow control valve over a needle valve? Explain its working with the help of a neat sketch. **5**

5B. With the help of a circuit diagram explain the application of pilot operated check valve. **5**