Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

V SEMESTER B.TECH. (MECHANICAL ENGINEERING)

END SEMESTER EXAMINATIONS, NOV/DEC 2016

SUBJECT: FLUID DRIVES AND CONTROL [MME 4017]

REVISED CREDIT SYSTEM

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL** the questions.
- Sketches should be drawn neatly using scales (Strictly no free hand diagrams)

1A.	Sketch and explain the working of air pressure regulator	**4**
1B.	Sketch and explain the working of any rotary actuator	**4**
1C.	List any six advantages of pneumatic system	**2**
2A.	Sketch and explain the working of single solenoid actuated 5/2 direction control valve	**4**
2B.	Sketch and explain the working of time delay valve	**4**
2C.	Compare spool valves with poppet valves with any four factors	**2**
3A.	A double-acting cylinder is used to press together glued components. Upon operation of a push button, the cylinder extends. Once the fully advanced position is reached, the cylinder is to remain for a time of T= 6 seconds and then immediately retract to the initial position. The cylinder retraction speed is to be adjustable. A new start cycle is possible only after the cylinder has fully retracted. Write the pneumatic control circuit for this application.	**5**
3B.	Using a hot pressing die, packing material is to be sealed by application of heat and pressure. By pressing a push button switch the heating rail is advanced and the packing material is heated along the adhesive strip. After the adhesion pressure has been reached, the heating coil is returned to its start position. Write the electro-pneumatic circuit for this application.	**5**
4A.	Sketch and explain the working of bent-axis piston pump	**4**
4B.	Sketch and explain the working of pressure sequence valve used in oil hydraulics	**4**
4C.	What is the difference between an open-center and closed-center type of directional control valve	**2**
5A.	Sketch and explain the working of Counterbalance valve	**4**
5B.	Sketch and explain the working of pilot operated check valve	**4**
5C.	A pump supplies oil at 0.002 m^3/s to a double acting cylinder of 50 mm diameter. The rod diameter is 20 mm. If the load is 6000 N both in extending and retracting, find the power developed during the extension and retraction stroke.	**2**