Reg. No.										

Manipal Institute of Technology, Manipal

(A Constituent Institute of Manipal University)

V SEMESTER B.TECH (AUTOMOBILE ENGINEERING)

END SEMESTER EXAMINATIONS, DEC 2015/JAN 2016

SUBJECT: PNEUMATICS AND HYDRAULICS [AAE 357]

REVISED CREDIT SYSTEM

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ANY FIVE FULL** the questions.
- Missing data may be suitable assumed.

1A.	With neat sketch, explain the functional and constructional features of a diaphragm type compressor.	**04**
1B.	Explain the function of pressure regulator in the air service unit.	**03**
1C.	With neat sketch, explain cylinder-cushioning process.	**03**
2A.	What do you mean by logic controls? With neat sketch, explain the working of pneumatic logic valves.	**03**
2B.	With neat sketch, explain the working of one-way flow control valve.	**03**
2C.	A double acting cylinder is to extend and punch a work-piece when either a push button valve or foot pedal valve pressed. The cylinder is to retract after reaching forward end position and pressing another push button. Speed of forward and return stroke should independently controllable. Develop pneumatic circuit to control the task.	**04**
3A.	Sketch and explain different types of pushbuttons used in electro pneumatic circuits.	**03**
3B.	In a stamping station, clamping cylinder extends and brings job under the stamping cylinder. Stamping cylinder extends and stamps the job. Clamping cylinder can return back only after stamping cylinder has retracted fully. Draw displacement diagram, identify signals and draw electro pneumatic circuit to develop the task.	**05**
3C.	With neat sketch, explain the working of reed switch.	**02**
4A.	Sketch and explain working of 5/2 memory valve used in pneumatic system.	**03**
4B.	Explain the working of relay used in electro pneumatic circuits.	**02**
4C.	A double acting cylinder is used to press together glued components. Upon operation of a push button, the clamping cylinder slowly advances. Once the fully extended position reached, the cylinder is to remain for 6 seconds and then immediately retract to the initial position. A new start cycle is only possible after the cylinder has fully retracted and after a delay of 5 seconds. During this delay, the finished parts manually removed and replaced with new parts for gluing. The retracting speed is to be rapid, but adjustable. Develop electro pneumatic circuit.	**05**

5A.	Discuss the function of various elements used in hydraulic power pack with sketch	**04**
5B.	With neat sketch, explain the working of compound relief valve.	**03**
5C.	The swash plate type axial piston pumps delivers 2 liters/second at 3000 rpm. The pump has nine 16mm diameter pistons arranged on a 130 mm piston circle diameter. Find the offset angle. Assume the volumetric efficiency as 95%.	**03**
6A.	Classify positive displacement pumps and with neat sketch explain the working of external gear pump.	**04**
6B.	With suitable circuit diagram, explain the working of accumulator as an auxiliary power source.	**04**
6C.	Explain the difference between meter-in and meter-out with the help of circuit diagram.	**02**