Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY
Manipal University, Manipal – 576 104

VII SEM. B.Tech. MECHANICAL ENGG. DEGREE END SEMESTER EXAMINATIONS NOVEMBER / DECEMBER 2015

SUBJECT: PNEUMATICS & HYDRAULICS (MME-443) (Elective – III)
REVISED CREDIT SYSTEM

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates
- Answer **ANY FIVE FULL** questions.
- Draw neat sketches using pencil only.

1A) Explain the working of time delay valve used in pneumatic system with sketch and draw a circuit diagram giving its application. **(04)**

1B) Sketch and explain the working of a pneumatic pressure regulator. **(03)**

1C) Sketch a hydraulic circuit giving the application of a pressure sequencing valve. **(03)**

2A) A double acting cylinder is to be controlled using by a solenoid operated direction control valve. The piston is required to advance on actuation of a detent push button. If the cylinder is in retracted position and it should continuously reciprocate from home to forward end position. Before each retraction of the cylinder, it is mandatory to ensure that pre-set pressure has developed behind the piston of the cylinder. The cylinder should stop after release the detent push button. Draw the pneumatic circuit for this application **(04)**

2B) Explain the working principle of the proximity sensor used in detecting plastic caps. **(03)**

2C) Explain the working of 4/3 direction control valve with neutral position recirculation type (regenerative) used in hydraulic system with the help of circuit. **(03)**

3A) Explain the principle of working of a dead weight type accumulator used in a hydraulic system with sketch and list any four functions performed by it. **(04)**

3B) Write pneumatic circuits which employ **(03)**
i) Suction Throttling ii) Exhaust Throttling

3C) Explain the working of a relay used in electro pneumatics with sketch and draw a circuit using relay latching principle. **(03)**

4A) Sketch and explain working of pressure to electric convertor used in pneumatic system. **(04)**

4B) Draw the hydraulic circuits to illustrate the use of filter at different locations. **(03)**

4C) Explain the function of various parts of a hydraulic power pack with sketch. **(03)**

5A) Explain the working of hydraulic 4/2 directional control valve with sketch and also state the limitation of two position direction control valve. **(04)**

5B) Explain the principle of working of a one way flow valve used in pneumatics with sketch. **(03)**

5C) Explain the principle of working of radial piston pump used in a hydraulic system with sketch and state its application. **(03)**

6A) Write the circuit for the cylinder sequence A+B+B-A- using cascade method **(04)**

6B) Sketch the symbols of the following pneumatic and hydraulic elements **(03)**

i) Counter balance valve
ii) Shuttle valve
iii) Pressure Reducing valve
iv) Single pilot 5/2 way valve,
v) 4/3 valve with mid position closed
vi) Unloading valve

6C) A cylinder is required to extend against a load of 200KN with a maximum pressure of 15,000 KPa. What cylinder size is required? **(03)**