Reg.No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

I SEMESTER M.TECH (ME) MAKEUP EXAMINATIONS, DEC 2018

SUBJECT: FLUID POWER AUTOMATION [MME 5124]

REVISED CREDIT SYSTEM

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

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

1A	Explain the working of lubricator used in pneumatics with sketch.	**4**
1B	Discuss the principle of working of a quick exhaust valve used in pneumatics with sketch.	**3**
1C	A press with a stamping die is available for this purpose. The double acting cylinder should extend when both the push buttons S1 and S2 are pressed simultaneously. The return stroke is to occur automatically only after the forward end position and preset pressure have been reached to get the consistent quality. The cylinder should immediately retract if emergency push button E is pressed.	**3**
2A	Discuss the principle of working of pressure reducing valve used in hydraulics with sketch and draw an application circuit.	**4**
2B	Explain the working principle of the following types of proximity sensors used in electro pneumatics with sketch. i) Reed switch sensor ii) Inductive sensor.	**3**
2C	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.Next cycle should be possible only after the push buttons are released.	**3**

3A Explain the principle of working of a float type 4/3 direction control valve with sketch and state its advantages. **4**

3B Write the pneumatic circuit for achieving the three cylinder sequence A+B+B-A-C+C- using cascade method. **3**

3C Explain the principle of working of air filter unit used in pneumatic control with sketch. **3**

4A Explain the working of unloading valve used in hydraulics with sketch and also write its application circuit. **4**

4B Explain the principle of working of end cushioning used in hydraulic cylinders with sketch. **3**

4C A pump supplies oil at 0.0016m^3/sec (Q_{in}) to a 40 mm diameter double acting hydraulic cylinder. If the load is 5000 N (F_{ext} and F_{ret}) and the rod diameter is 20mm, find the **3**

1. Cylinder KW power during the extending stroke.
2. Cylinder KW power during the retracting stroke.
3. Piston velocity during extending
4. Piston velocity during retracting

5A Explain different types of accumulators used in hydraulics with diagram and state their application. **4**

5B Write the hydraulic circuits employing pilot operated check valve and state its application. **3**

5C Find the output load force for the hydraulic cylinder force of 2000N in the toggle mechanism shown in figure Q(5C). **3**

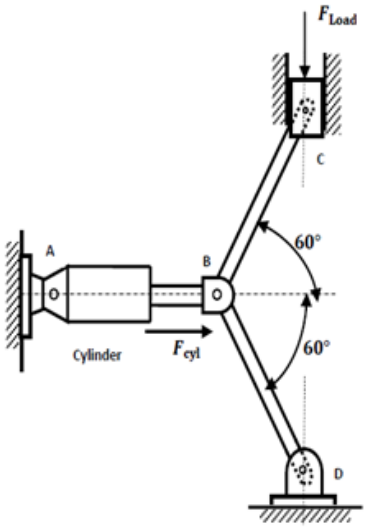

Fig. Q(5C)