

(A constituent unit of MAHE, Manipal)

V SEMESTER B. TECH (MECHANICAL/IP ENGG.) END SEMESTER EXAMINATIONS, NOVEMBER 2018

SUBJECT: FLUID DRIVES AND CONTROL [MME4017]

REVISED CREDIT SYSTEM

Time: 3 Hours

MAX. MARKS: 50

Instructions to Candidates:

- ✤ Answer ALL the questions.
- Draw neat sketches (strictly no free hand diagrams)

1A.	Sketch and explain the working of air lubricator used in pneumatic system	4
1B.	The parcel separating device feeds parcel post from a sloping conveyor sled to an X-ray appliance (Refer to sketch). Operating all three push buttons simultaneously causes very rapid retraction of the single acting cylinder (1A) with the attached parcel tray. After releasing the valve actuator, the piston rod advances. Forward motion time $t = 0.9$ seconds. A pressure gauge is fitted before and after one way flow control valve. Also write the displacement diagram for this application.	
		4
1C.	Write the pneumatic symbols for following valves i) Pressure sensor / sequence valve ii) Air compressor iii) Air lubricator	2
2A.	Sketch and explain the working of pneumatic time delay valve	4
2B.	Two double acting cylinders (1A) and (2A) press together two electrically heated bars and in doing so, join two thermoplastic sheets by welding. The thickness of the sheets varies between 1.5 mm and 4 mm. The seams may be of any length. The piston force of both cylidners is limited via pressure regulator at 4 bar. By actuatying a pushbutton, two double acting cylinders are made to advance in parallel with their exhaust air resticted. To assist regulation pressure gauges have been fitted between the cylinderes and one waty flow control valves. The end positinos of the cylinders are varified with	4
M	ME4017 Page 1 of 2	

	sensors. After a time of t = 1.5 seconds, the bar moves back to the intial position. The return stroke may be instantly intiated by means of second push button.	
2C.	With a suitable symbol write a note on pneumatic memory valve.	2
3A.	Sketch and explain the working of pressure sensor used in electro pneumatics	4
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. Next cycle should be possible only after the push buttons are released.	4
3C.	Sketch and explain the working electric push button	2
4A.	Sketch and explain working of pressure sequence valve? Also write suitable application circuit demonstrating use of this valve.	4
4B.	Sketch and explain working of balanced vane pumps? Also compare this valve with unbalanced vane pump.	4
4C.	Write a note on basic structure of electro-hydraulic system	2
5A.	Sketch and explain working of gas loaded accumulator? Also write the electro hydraulic circuit demonstrating the use of accumulator for emergency source.	4
5B.	Sketch and explain working of pressure compensated flow control valve? Mention its advantages over non-compensated valves.	4
5C.	Define the terms: i) pressure override iii) dominant on latching iv) Pilot line	2