

New

Date: 16/05/2017

Student Exam No: _____

GANPAT UNIVERSITY

B.Tech Sem. VIth Mechatronics Engineering
CBCS Regular Examination May/June - 2017
2MC601 Hydraulics & Pneumatics Systems

Time: 3 Hours

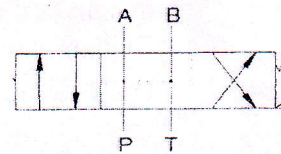
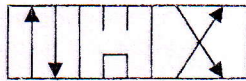
Total Marks: 60

Instructions:

- 1) All questions are **compulsory**.
- 2) Figures to the **right** indicate full marks.
- 3) Answers to the two sections must be written in **separate** answer books.

Section - I

- Q. 1 (A) Explain use of accumulator in hydraulic application with net sketch. [03]
(B) Where following central position direction control valves are used in hydraulic circuits. Give its Advantages. [03]



- (C) Explain Hydraulic circuits for drilling machine with function diagram. [04]

OR

- Q. 1 (A) Specify required fluid properties of hydraulic oil used in hydraulic machines. [03]
(B) Suggest best power system (Hydraulics, Pneumatics, and Electrical) to the following application. [03]
1. Dam gates 2. Stacking Lifts 3. CNC chuck motor 4. Plane wheels operating systems
5. Stone barker hammers 6. Grinder
7. Robot gripper

- (C) Give application & advantage of dual pump. Prepare dual pump unloading circuit. [04]

- Q. 2 (A) Draw construction diagram and Explain working of counter balance valve. Give its applications. [03]
(B) Differentiate throttle valve, 2 way flow control valve and three way flow control valve. [03]
(C) Prepare hydraulic circuits for speed control of motor. [04]

OR

- Q. 2 (A) Give basic function, symbol and location in hydraulic circuit & application for following valves. [03]
1. Reducing Valve 2. Sequence valve 3. Unloading valve
(B) Draw construction diagram and explain working of servo valve. [03]
(C) Prepare load locking circuit by using pilot operated check valve. [04]

Q. 3 Answer the following Questions:

- (A) What are the oil conditioning equipment's are used in hydraulics systems? Explain its working and location in hydraulic circuits with Symbol. [03]
- (B) A flow supplied by pump is 20 lit/sec. Dimensions of cylinder is 70 mm and dia. of piston rod is 30 mm. Load during forward stroke is 500 N and 300 N during return stroke. i) Find pressure and power during forwarded and return stroke when cylinder is horizontal and ii) If cylinder is Inclined 30° . [04]
- (C) Write selection criteria of hydraulic pump. [03]

Section – II

- Q. 4** (A) Explain a lobe compressor and its application [03]
(B) Explain the different actuation methods of a direction control valve. [03]
(C) Explain pneumatic circuit for operating double acting cylinder automatically. [04]

OR

- Q. 4** (A) Explain an air regulator. [04]
(B) A single acting air cylinder with a 6 cm diameter piston and 30 cm stroke operates at 700 kPa (g) pressure and reciprocates at 80 cycles/min. Compute the air consumption in standard m^3/min . [02]
(C) Explain pneumatic circuits with neat sketch and for Cylinder extends when two 3/2 DCV (Switch A) or one other 3/2 DCV (Switch B) pressed. [04]

- Q. 5** (A) Make a pneumatic circuit for a given sequence: START $A^+B^+B^-A^-C^+C^-$ STOP. Draw the timing diagram of the given sequence also. [07]
(B) Explain advantages of a pneumatic motor. [03]

OR

- Q. 5** (A) Explain the quick exhaust valve with a pneumatic circuit. [05]
(B) Make a pneumatic circuit for the following application. [05]
"When I press PBs of the two 3/2 DCVs then only a DA cylinder starts the forward stroke after few seconds. When the cylinder completes forward stroke, it start return stroke automatically. Here return stroke is faster than its normal speed. Here the DA cylinder is operated by a 5/2 both side pilot operated DCV".

Q. 6 Answer the following Questions:

- (A) Explain (i) through rod cylinder, and (ii). Tandem cylinder [03]
(B) Explain the various mountings of pneumatic cylinder with figure. [03]
(C) Draw & Explain separately meter-in and meter-out circuit in pneumatic system. [04]

END OF PAPER