TE/MTRX/Sem-VI/CBSGS

Dt:- 14/06/2017

T2226/T3006 / APPLIED HYDRAULICS AND PNEUMATICS

Q.P. Code :13072

(3 Hours) **[Total Marks: 80]**

N.B. (1) Question No. **1** is compulsory
(2) Attempt any **three** questions out of the remaining **five** questions.
(3) Figures to the **right** indicate **full marks**.
(4) Assume suitable data wherever required but justify the same.

1. Write short notes on any four of the following. 20
   (a) Applications of fluid power
   (b) Axial piston pump
   (c) Regenerative circuit.
   (d) Quick exhaust valve
   (e) Pneumatic speed control circuits

2. (a) Oil with v = 0.001 m^2/s is flowing in a 50 mm diameter pipe at a velocity of 5 m/s. Find the head loss due to friction for a 50m length of pipe. 8

   (b) Why the output force and piston velocity of a double acting cylinder are not same during extension and retraction strokes? Also explain the need, construction and working of hydraulic cylinder cushions. 12

3. (a) What is intensifier ?Draw and explain the intensifier circuit used in punch press operation. 10

   (b) Write short note on pneumatic direction control valves. Include construction and working of any 2 direction control valves, conventions and symbols for representation of position and actuation types. 10

4. (a) Draw and explain the counterbalance valve application circuit. 9

   (b) In a stamping application cylinder A extends and brings a job / workpiece under a stamping cylinder B . The cylinder B then extends and stamps the job. Cylinder A can return back only after cylinder B has retracted fully. Draw the displacement step diagram and develop a pneumatic control circuit using Shift Register (Stepper Sequencer) method. 11

5. (a) Explain construction, working and symbol of AND logic valve. 5

   (b) Rectangular shaped work-pieces are drilled using a pneumatically controlled drilling machine . The work pieces are arranged in a gravity feed magazine. These workpieces are pushed and clamped by means of a clamping cylinder A, 15

[TURN OVER]

drilled by drilling cylinder B and ejected by ejecting cylinder C. The displacement step diagram is shown in figure 1. The sequence of operation is to be carried out either for one cycle or for continuous cycle with start and stop controls. Develop the electro -pneumatic control circuit to implement the given control task.

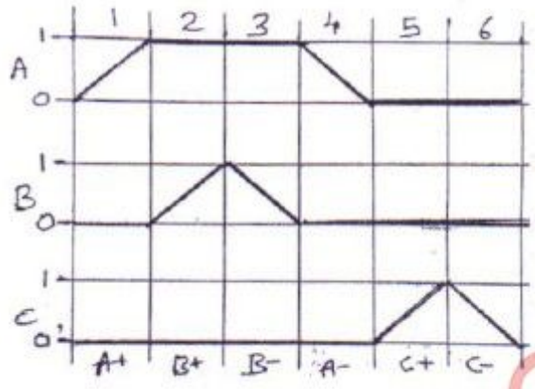

FIGURE 1

6. (a) A double acting cylinder is used to press together glued components. Upon operation of a push button, the cylinder is to extend and trip the roller valve. Once the fully extended position is reached , the cylinder is to remain there for 5 s to press the components and then to retract to initial position. Develop a pneumatic control circuit to implement this control task. 10

(b) What is a PLC? Draw the PLC architecture and explain the scan cycle operation. 10