Roll No. | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 18

B.Tech. (Automation & Robotics) (2012 & Onward) (Sem.–5)

HYDRAULIC AND PNEUMATICS

Subject Code : BTAR-501

M.Code : 70475

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

Answer briefly :

1. List the properties of hydraulic fluids.
2. Give any two differences between pneumatic power and hydraulic power.
3. Draw the standard symbols for
   a) variable displacement reversible pump
   b) telescopic cylinder.
4. When is lobe pump preferred?
5. Mention advantages of air motor over electric motor.
6. Mention the areas in a pneumatic system, which should be given higher importance during maintenance.
7. What are the functions of FRL unit?
8. Where speed control circuits are required?
9. State four advantages of hydro-pneumatic circuits.
10. A pump has a displacement volume of 0.0819×10^{-3} m^3 it delivers 0.0758 m^3/min at 1000 rpm at 67 bar if the prime mover input torque is 100 N- m. What is the overall efficiency?

SECTION-B

11. State the sources of contamination in hydraulic systems and its remedial measures.

12. A double acting cylinder is hooked in regenerative circuit. Maximum pressure setting of PRV is 100 bars. Piston area = 120 cm^2, Rod area = 60 cm^2, if pump flow is 0.0016 m^3/s, find cylinder speed and load carrying capacity during extension and retraction stroke. Comment on the power delivered by hydraulic cylinder during both strokes.

13. With a neat sketch explain the construction and cushioning mechanism in a cylinder.

14. How will you measure the pump performance? Explain each with suitable examples?

15. Write an explanatory note on the maintenance schedule of pneumatic system.

SECTION-C

16. Design a pneumatic system to control the motion of double acting cylinder in such a way that the forward movement of piston rod can be possible with three different speeds (lower than normal speeds) but the piston comes back with its normal speed. The piston can be stopped at any position between two extreme positions also.

17. a) Describe with a neat diagram the construction and working of a spring loaded accumulator. State its advantages.

    b) Describe the applications of fluid power system and list the main components required for a power pack circuit.

18. Write short notes on :

    a) Intensifier

    b) Hydro pneumatic cylinders.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.