Reg. No. : | | | | | | | | | | |

Question Paper Code: 45076

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2017

Fifth Semester

Mechanical Engineering

14UME506 - APPLIED HYDRAULICS AND PNEUMATICS

(Regulation 2014)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. How is power transmitted in fluid power systems?

   (a) Gradually (b) Instantaneously
   (c) Both (a) and (b) (d) Very slowly

2. Which fluid is used in hydraulic power systems

   (a) Water (b) Oil
   (c) Non Compressible Fluid (d) All the above

3. Which of the following pump ejects variable quantity of fluid per revolution?

   (a) centrifugal pump (b) gear pump
   (c) screw pump (d) rotary pump

4. The flow rate in gear pump

   (a) Increases with increase in pressure
   (b) Decreases with increase in pressure
   (c) More or less remains constant with increase in pressure
   (d) Unpredictable

5. What does the number 4/3 in valve mean?

(a) 4 positions and 3 ways (b) 4 ways and 3 positions
(c) 4 ways or 3ways (d) 3 ways or 4 positions

6. A _____ is designed into most hydraulic systems to prevent damage due to excessive pressure

(a) Directional control valve (b) Relief valve
(c) Lift control valve (d) Flow control valve

7. Pneumatic systems usually do not exceed.

(a) ½-1 *HP* (b) 1-2 *HP* (c) 2-3 *HP* (d) 4 - 6 *HP*

8. In which of the following compressors, air is drawn in axially, accelerated to high velocity and then expelled in a radial direction.

(a) Reciprocating piston compressor (b) Rotary screw compressor
(c) Rotary vane compressor (d) Turbo compressor

9. Fluid Power circuits use schematic drawings to

(a) Simplify component function details
(b) Make the drawing look impressive
(c) Make it so only trained persons can understand the functions
(d) All the above

10. The inability of any pump to draw full charge of oil is known as

(a) Cavitation (b) Efficiency (c) Deficiency (d) None of these

PART - B (5 x 2 = 10 Marks)

11. Recall four primary functions of a hydraulic fluid.

12. List the six basic components used in a hydraulic systems.

13. Interpret backpressure in fluid system.

14. Write down the basic criteria to select the Pneumatic Cylinders.

15. List basic elements of PLC.

PART - C (5 x 16 = 80 Marks)

16. (a) Explain the major and minor losses in pipes with suitable sketches. (16)

Or

(b) (i) With neat sketch explain the components of hydraulic fluid power systems. (12)

(ii) Write short notes on laminar and turbulent flow. (4)

17. (a) Explain with neat sketch the working principle of external gear pump. (16)

Or

(b) (i) Construct a neat sketch of balanced vane pump and explain its working principle. (10)

(ii) Give details on cylinder cushioning in actuators. (6)

18. (a) (i) How does the pilot operated direction control valve function? Explain with neat diagram. (8)

(ii) Design a suitable circuit for Two hydraulic cylinders two work in sequence. (8)

Or

(b) (i) Explain with a neat sketch about the construction of pilot operated check valve. (8)

(ii) Describe the working of a pressure sequence valve with a typical example. (8)

19. (a) Develop an electro pneumatic circuit for the following sequence A+B+A-B- where A & B stand for cylinder (+) indicates extension and (-) indicates retraction of cylinders. (16)

Or

(b) Design the following fluid power circuits with examples

(i) Cylinder synchronizing circuit (ii) Hydro-pneumatic circuit (16)

20. (a) How the PLC is used in fluid power control Explain with suitable example. (16)

Or

(b) Elaborate in detail about the capabilities of electro-hydraulic servo system and also discuss why hydraulic servo system is preferred than electrical motor drives. (16)

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