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Question Paper Code: 45706

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2018

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)

- One litre of water occupies a volume of
 - 100 cm^3
 - 250 cm^3
 - 500 cm^3
 - 1000 cm^3
- Which fluid is used in hydraulic power systems
 - Water
 - Oil
 - Non Compressible Fluid
 - All the above
- The flow rate in gear pump
 - Increases with increase in pressure
 - Decreases with increase in pressure
 - More or less remains constant with increase in pressure
 - Unpredictable
- _____ converts pressure energy of fluid into mechanical work.
 - Pump
 - Actuator
 - Compressor
 - Motor

5. The most common accumulator circuit is
 - (a) supplementing pump flow
 - (b) making up for system leaks
 - (c) emergency power supply
 - (d) none of these

6. Check valve is a type of
 - (a) pressure reducing valve
 - (b) pressure relief valve
 - (c) directional control valve
 - (d) pressure sequencing valve

7. 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

8. Which of the following is used to sense the initial and final positions of a piston rod?
 - (a) lever operated direction control valve
 - (b) roller lever valve
 - (c) limit switch
 - (d) all the above

9. The inability of any pump to draw full charge of oil is known as
 - (a) cavitation
 - (b) efficiency
 - (c) deficiency
 - (d) none of these

10. 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

PART - B (5 x 2 = 10 Marks)

11. Define the term fluid power.
12. List the six basic components used in a hydraulic systems.
13. List applications of fluid power in the automotive industry.
14. What is the use of bleed-off circuit?
15. List basic elements of PLC.

PART - C (5 x 16 = 80 Marks)

16. (a) Explain various types of fluid power systems. (16)

Or

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

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

Or

(b) Represent the working principle of external gear pump and determine its performance measures. (16)

18. (a) (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)

Or

(b) Illustrate the working of bladder type accumulator and its application. (16)

19. (a) Discuss the construction and working principle of a rotary vane and lobe compressors. (16)

Or

(b) 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)

20. (a) 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)

Or

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