

B.E DEGREE EXAMINATIONS: APRIL/MAY 2014

(Regulation 2009)

Sixth Semester

MECHANICAL ENGINEERING

MEC116: Fluid Power System

Time: Three Hours

Maximum Marks: 100

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. The pressure intensifier increases the pressure in proportion to
 - a) Ratio of diameters
 - b) Square of ratio of diameters
 - c) Inverse ratio diameters
 - d) Square of inverse ratio diameters
2. In a balanced vane pump, the rotor and vanes are contained within a _____ eccentric cam ring and there are _____ inlet segments and two outlet segments during each revolution.
 - a) Single, one
 - b) Double, one
 - c) Double, two
 - d) Single, two
3. The function of pilot operated check valve is
 - a) Allow flow in one direction
 - b) Allow flow in both direction
 - c) Does not allow flow
 - d) Allow flow in both direction based on pilot signal
4. _____ is used to maintain reduced pressures in specified locations of hydraulic systems.
 - a) Counterbalance
 - b) Pilot relief valve
 - c) Pressure-reducing valve
 - d) Unloading
5. _____ systems are used primarily when the external load opposes the direction of motion of the hydraulic cylinder
 - a) Meter in
 - b) Meter out
 - c) Bleed off
 - d) Regenerative
6. Fail-safe circuits are those designed to prevent injury to _____ or damage to _____
 - a) Service personal, accumulator
 - b) Operator, valves
 - c) Service personal, Pump
 - d) Operator, machine
7. FRL stands for
 - a) Refrigeration unit
 - b) First regulator lubricant
 - c) Filter regulator lubricator
 - d) Filter regular link
8. Positioning accuracy of pneumatic actuator is _____ compared to hydraulic systems
 - a) Low
 - b) Excellent

- c) Good
 - d) High
9. Entrained gas can also occur when the pressure drops below the _____ of the hydraulic fluid
 - a) Atmospheric pressure
 - b) Vapor pressure
 - c) System pressure
 - d) Recirculation pressure
10. Servo system that uses _____ is more accurate
 - a) Mechanical
 - b) Electronics
 - c) Electrical
 - d) Feedback

PART B (10 x 2 = 20 Marks)

11. Compare hydraulic and pneumatic system?
12. Why end cushions are used in cylinders?
13. List the types of pressure control valves.
14. Draw the graphical symbol for three –position, four ways closed center spring return solenoid actuated direction control valve.
15. What is the function of accumulator?
16. List the important components in a hydraulic power pack.
17. Classify the different types of air compressors?
18. List the advantages and limitations of compressed air.
19. Define FLUIDICS.
20. What is servo valve? How does it work?

PART C (5 x 14 = 70 Marks)

21. a) (i) Explain with neat sketch the construction and working of internal gear pump. (10)
(ii) List the Differences between positive displacement and non-positive (4)
displacement pump.

(OR)

- b) (i) How the capacity of a variable displacement vane pump is adjusted? Explain (10)
with a diagram.
(ii) What are the advantages of oil hydraulic systems over others? (4)
22. a) (i) With neat sketch describe the construction and operation of pressure regulated (7)
flow control valve.
(ii) Discuss the constructional features of rotary direction control valves. (7)

(OR)

- b) (i) Explain the construction of reservoir with neat sketch and list the functions of (7)

reservoir.

- (ii) Illustrate the application of a sequence valve used in hydraulic systems with a (7)
suitable example.

23. a) Design a circuit for fast approach, slow feed, and rapid return in shaping
operation.

(OR)

- b) (i) Design a suitable circuit for the synchronized movement of two hydraulic (8)
cylinders.
(ii) Explain the use an accumulator as a leakage compensator. Design a circuit to (6)
fulfil these requirements.

24. a) What is compressor? Explain the working principle of piston type compressor
with neat sketch.

(OR)

- b) Develop a continuous single cylinder reciprocation circuit for pneumatic system
using limit switches and relays.

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

(OR)

- b) (i) Explain the working principle of a PLC with neat block diagram. (10)
(ii) How does a P L C differ from microprocessor? (4)
