Register Number: .....

B. E. DEGREE EXAMINATIONS: APRIL / MAY 2012

Sixth Semester

MECHATRONICS ENGINEERING

MCT114: Applied Hydraulics and Pneumatics

Time: Three Hours **Maximum Marks: 100**

Answer ALL Questions:-

PART A (10 x 1 = 10 Marks)

1. Which one of the following fluid power control system having feedback?

   A. open loop system B. PLC system C. electronic control system D. closed loop system

2. The basic principle of fluid power was developed by

   A. Kennedy B. Pascal C. Goodmen D Robert

3. Centrifugal pumps are the examples of

   A. hydrostatic displacement pump B. hydrodynamic displacement pump

   C. positive displacement pump D. variable delivery pump

4. Which one of the following cylinder increase the output force when the bore size of a cylinder is limited?

   A. tandem cylinder B. telescopic cylinder C. double rod cylinder D. helical cylinder

5. In which one of the following valve, permits a system to operate from either of two fluid power sources?

   A. check valve B. pilot valve C. shuttle valve D. sequence valve

6. Which one of the following device is used to convert low pressure fluid power into high pressure fluid power?

   A. intensifier B. accumulator C. actuator D. reservoir

7. Which one of the following compressor having two rotors?

   A.vane compressor B. screw compressor C. piston compressor D. sliding compressor

8. Which one of the following method having digital modular counter?

   A. servo method B. classic counter method

   C. step counter method D. logic counter method

9. The representation of harware connection between switches, relays, solenoids etc is called as

   A. PLC diagram B. modular diagram C. flow diagram D. ladder diagram

10. _____ is preferred for high power applications

    A. pneumatic system B. hydraulic system C. oil system D water system

PART B (10 x 2 = 20 Marks)

11. What are the types of fluid power system based on the type of control?
12. Mention any four types of hydraulic fluid
13. Write the working principle of piston pump
14. What is cylinder cushioning?
15. What is solenoid? How does it work?
16. State the functions of accumulator in hydraulic circuit.
17. State Charles law for a perfect gas
18. List out the common methods used for compound circuits
19. What is MPL?
20. What is programmable logic controller?

PART C (5 x 14 = 70 Marks)

21. a) Explain in detail about the applications of fluid power

(OR)

b) (i) List out the advantages of fluid power systems (7)

(ii) List out the properties of hydraulic fluid (7)

22. a) (i) A pump has a displacement of 81.9 cm^3 . It delivers 75.8 x 10^{-3} m^3 / min. at 1000 rpm at 67 bar. If the prime mover input torque is 100 Nm, (i) What is its overall efficiency and volumetric efficiency? (ii) What is the theoretical torque required to operate the pump? (8)

(ii) With a neat sketch, explain the working principle of external gear pump (6)

(OR)

b) Explain the working of Double acting cylinder with cushioning.

23. a) With a neat sketch, explain the working principle of pressure reducing valve with its application circuit.

(OR)

b) With neat sketches, explain meter-in and meter-out circuit. Also write the differences between them.

24. a) With neat sketches, explain the types of pneumatic valves

(OR)

b) With the sequence of operations, design a system for the following. Draw its cascade circuit

Cylinder A extends to clamp the workpiece

Cylinder B extends to do the punching and retracts after punching

Cylinder A retracts to unclamp the workpiece

Cylinder C extends to removes the workpiece and retracts after removal of workpiece.

25. a) With a neat sketches, explain the any two electro pneumatic circuit

(OR)

b) Explain the hydraulic pump system-operating problems, corresponding possible causes and remedies for each of the trouble.

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