Register No: ……

B.E DEGREE EXAMINATIONS: APRIL/MAY 2011

Sixth Semester

MECHATRONICS ENGINEERING

U07MH602: Applied Hydraulics and Pneumatics

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

Answer ALL Questions:-

PART A (10 x 1 = 10 Marks)

1. Which of the following is not a desired property of hydraulic fluid?

   a) Toxicity b) low volatility c) Ideal viscosity d) Low density

2. The temperature at which the oil will release sufficient vapour to support combustion continuously for 5sec when the flame is passed over the surface is called

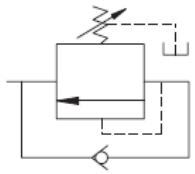
   a) Flash point b) Fire point c) Steam point d) Pour point

3. Which pump is used for high pressure low volume application?

   a) Non positive displacement pump b) positive displacement pump

   c) negative displacement pump d) Both A & C

4. The symbol below represents



   a) reducing valve b) Sequence valve c) Pressure relief valve d) check valve

5. Vane motors develop torque by the hydraulic pressure action on the

   a) Exposed surface of vanes b) Axis of vanes c) Flowing fluid d) Piping

6. The commonly accepted design of gas loaded accumulator is

   a) Spring type b) Separator type c) Non-separator type d) Regulator type

7. A device which is used to control the noise caused by the exhausting air stream is called

   a) Muffler b) Lubricator c) Pneumatic cylinder d) Flow control valve

8. Micro filters remove particles down to a size of

   a) 0.01 micron b) 1 micron c) 0.1 micron d) 10 micron

9. OR MPL element is a

   a) Shuttle valve b) Twin pressure valve c) Quick exhaust valve d) Check valve

10. What is the cause for unusual noise in compressor?

a) valve seat worn b) leaking cylinder valve c) loose motor fan d) all the above

PART B (10 x 2 = 20 Marks)

11. Give any two advantages of fluid power.
12. State the Pascal's Law.
13. What is positive displacement pump?
14. List the types of cylinders.
15. What is the significance of shuttle valve?
16. Brief the diaphragm type of accumulator.
17. What is use of quick exhaust valve in pneumatics?
18. Give the types of air compressors.
19. What is MPL?
20. What is the remedy for leakage in cylinders?

PART C (5 x 14 = 70 Marks)

21. (a) Discuss the various desired properties of hydraulic fluids and give some commonly used hydraulic fluids.

(OR)

(b) Describe the working of pressure compensated vane pump with a neat sketch.

22. (a) (i) Find the discharge of a gear pump having no. of teeth = 16, width = 0.065 m, module = 6mm, Pressure angle = 20°, Gear's outer diameter = 0.108 mm, Speed = 1600 rpm and volumetric efficiency = 88%. (7)

(ii) Discuss the efficiencies involved in hydraulic pumps. (7)

(OR)

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

23. (a) Describe the working of pressure unloading valve with application circuit.

(OR)

(b) Explain the circuits for accumulator used as leakage compensator and shock absorber.

24. (a) (i) Brief the required properties of pneumatic air. (4)

(ii) Describe any one of air over oil circuit. (10)

(OR)

(b) Design the pneumatic circuit for the sequence A+ B+ B-A-.

25. (a) (i) Describe the Fluidic elements OR and AND. (7)

(ii) Explain any one of the Electro pneumatic circuit. (7)

(OR)

(b) (i) What is coanda effect? Explain with neat sketch. (7)

(ii) What are the maintenance activities normally done on flow control valve and sequence valve? (7)

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