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Reg. No. :

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Question Paper Code: 59704

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2019

Elective

Mechanical Engineering

15UME904 - APPLIED HYDRAULICS AND PNEUMATICS

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

PART A - (10 x 1 = 10 Marks)

1. The characteristic of turbulent flow CO1- R
 - (a) the direction of flow and movement of particles is same
 - (b) high velocity
 - (c) change in cross section does not affect the flow
 - (d) all of the above

2. The Reynolds number for laminar flow is CO1 -R
 - (a) more than 2800
 - (b) more than 2000
 - (c) less than 2000
 - (d) between 2000 and 2800.

3. Which of the following is a type of low-torque high-speed motor? CO2- R
 - (a) radial piston motors
 - (b) axial piston motors
 - (c) bent axis motor
 - (d) gear motor

4. Variable displacement pumps used in hydraulic applications can CO2- R
 1. have variable flow rate
 2. consume less energy
 3. be operated with high accuracy for slow and rapid motion
 4. negative displacement
 - (a) 1 and 2
 - (b) 3 and 4
 - (c) 1, 2 and 3
 - (d) 2 and 3

5. Which valve is used to block the accumulator from the system for the purpose of safety? CO3- R
 - (a) pilot valve
 - (b) needle valve
 - (c) detent valve
 - (d) pressure relief valve

6. Telescopic cylinders have CO3 -R
 (a) only two stage units (b) Waiting Line
 (c) Both A and B (d) multistage units
7. Pneumatic systems usually do not exceed CO4 -R
 (a) 1 hp (b) 1 to 2 hp (c) 2 to 3 hp (d) 4 to 5 hp
8. When is a pressure reducing valve used? CO4 -R
 (a) Lead Time (b) Game Theory
 (c) Network Analysis (d) Required pressure is lower than system pressure
9. Pneumatic _____ convert the energy in the compressed air into CO5- R
 force and motion. The pneumatic drive elements can move in a linear,
 reciprocating or rotating motion.
 (a) Exhaust port. (b) Annular area (c) Drive elements (d) Inlet port
10. The advantage of PLC CO5- R
 (a) easy to find errors
 (b) replacements can be easily made
 (c) PLC's are easily programmed
 (d) all of the above

PART – B (5 x 2= 10Marks)

11. Draw the graphical symbol for fixed and variable displacement pump CO1- R
12. Differentiate between hydraulic and pneumatic system. CO2 -R
13. What are the functions of a hydraulic pump? CO3 -R
14. Draw the graphical symbol of FRL unit CO4- R
15. State the types of electro hydraulic servo valves? CO5- R

PART – C (5 x 16= 80Marks)

16. (a) Draw the basic pneumatic circuit and explain its principle of CO1 -App (16)
 working.
 Or
 (b) State Pascal's law and explain any one application with neat CO1- App (16)
 sketch.
17. (a) Explain the working principle of external gear pump with neat CO2- App (16)
 sketch.
 Or
 (b) Discover the applications of vane type rotary actuators with CO2- Ana (16)
 suitable sketches.

18. (a) Design and explain the working of an air – oil intensifier circuit. CO3- Ana (16)
Or
(b) Explain the construction and working principle of accumulator as hydraulic shock absorber and Emergency power source. CO3- Ana (16)
19. (a) Explain the construction and operation of air filter in FRL unit. CO4 -U (16)
Or
(b) Three pneumatic cylinders A, B and C are used in an automatic sequence of operation. A cylinder extends, B cylinder extends, B cylinder retracts and then A cylinder retracts, C cylinder extends and C cylinder retracts. Develop a pneumatic circuits using cascade method. CO4- Ana (16)
20. (a) Design and explain the working of a series and parallel synchronizing using pneumatic circuit CO5 -U (16)
Or
(b) Draw the Block diagram of the components present in a PLC and explain it . CO5- U (16)

