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Reg. No. :

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**Question Paper Code: 59704**

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

Elective

Mechanical Engineering

15UME904-APPLIED HYDRAULICS AND PNEUMATICS

(Regulation 2015)

Duration: Three hours

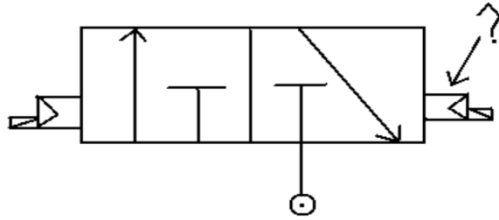
Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Fluid is a substance which offers no resistance to change of CO1- R  
(a) Pressure                      (b) Flow                      (c) Shape                      (d) Volume
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 energy is converted into mechanical energy by the hydraulic cylinders? CO2- R  
(a) Hydrostatic energy                      (b) Hydrodynamic energy  
(c) Electrical energy                      (d) Kinetic Energy
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. What is the part, shown in below diagram of 3/2 valve, called? CO3- R



- (a) Manually operated valve
- (b) Pilot operated valve
- (c) Pressure electric converter
- (d) Hydraulically operated valve

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 comparing first cost of hydraulic systems to pneumatic systems, generally they are: CO4- R

- (a) More expensive to purchase
- (b) Less expensive to purchase
- (c) Cost is same
- (d) Cost is not required

9. Pneumatic \_\_\_\_\_ convert the energy in the compressed air into force and motion. The pneumatic drive elements can move in a linear, reciprocating or rotating motion. CO5- R

- (a) Exhaust port.
- (b) Annular area
- (c) Drive elements
- (d) Inlet port

10. In which circuits, relay of low voltage and low current is used to make open or close contact? CO5- R

- (a) High voltage and high current circuit
- (b) Low voltage and low current circuit
- (c) High voltage and low current circuit
- (d) Low voltage and low current circuit

PART – B (5 x 2= 10 Marks)

11. List any four advantages of fluid power systems. CO1-R

12. Write the equation to find the theoretical discharge of external Gear pump. CO2- R

13. Define intensifier ratio. CO3- R

14. Recall the any four factors to be considered while designing the fluid power circuit. CO4- R

15. State any two advantages of PLCs over Electro-mechanical Relays. CO5- R

PART – C (5 x 16= 80Marks)

16. (a) Explain the different components in fluid power system and also mention its functions, symbols. CO1-U (16)
- Or
- (b) State Pascal's law and explain any one application with neat sketch. CO1-U (16)
17. (a) Classify the pumps and explain the working principle of piston pump and determine its performance measures. CO2-U (16)
- Or
- (b) Discover the applications of vane type rotary actuators with suitable sketches. CO2-U (16)
18. (a) Outline the 3/2 way and shuttle type directional control valve with neat sketch. CO3- App (16)
- Or
- (b) Explain the construction and working principle of accumulator as hydraulic shock absorber and Emergency power source. CO3- App (16)
19. (a) Explain the construction, working of a FRL system with neat sketch and also mention its applications. 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- App (16)
20. (a) Classify the hydraulic servo systems. Explain two stage electro hydraulic servo systems with suitable application? CO5- U (16)
- Or
- (b) Explain the common faults and causes for breakdown in hydraulic systems and explain the troubleshooting charts fault finding. CO5- U (16)

