A **Reg. No. :** | | | | | | | | | | |

Question Paper Code: 59704A

B.E. / B.Tech. DEGREE EXAMINATION, NOV 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. 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 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. The heat generated in hydraulic systems can be absorbed by CO2- R

   (a) lubrication (b)sealing (c) cooling (d) all the above

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. The lubricator in a pneumatic circuit is the CO4 -R

(a) First element in line (b) Second element in line

(c) Last element in line (d) Third element in line

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 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. Proportional valves are used to remotely control_____ via electrical signal. CO5- R

(a) Direction and Pressure (c) Force and floe rate

(b) Speed and direction (d) Speed and pressure

PART – B (5 x 2= 10Marks)

11. Define Pascal law CO1- R

12. Differentiate between hydraulic and pneumatic system. CO2 -R

13. Draw the 4/2 and 4/3 direction control valve in a hydraulic system CO3 -R

14. Draw the graphical symbol of FRL unit CO4- R

15. What is the purpose of a shuttle valve? CO5- R

PART – C (5 x 16= 80Marks)

16. (a) Explain the various losses associated with the hydraulic fluid power systems CO1 -App (16)

Or

(b) State Pascal's law and explain any one application with neat sketch. CO1- App (16)

17. (a) How piston pumps are classified? Explain the working principle of any two piston pump with neat sketch CO2- U (16)

Or

(b) Discover the applications of vane type rotary actuators with suitable sketches. CO2- U (16)

18.	(a)	Explain the working principle of hydraulic meter-in and meter-out circuit with neat sketch.	CO3- U	(16)
		Or		
	(b)	Explain the construction and working principle of accumulator as hydraulic shock absorber and Emergency power source.	CO3- U	(16)
19.	(a)	Explain the construction and operation of air filter in FRL unit.	CO4 -U	(16)
		Or		
	(b)	Design a pneumatic circuit for the following sequence using cascade method: A+B+A-B- where A andB stand for cylinders, (+) indicates extension and (-) indicates retraction for cylinders	CO4- Ana	(16)
20.	(a)	Design and explain the working of a series and parallel synchronizing using pneumaticcircuit	CO5 -Ana	(16)
		Or		
	(b)	Explain the various approaches for entering the program into the PLC.	CO5- U	(16)