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**Question Paper Code : 60858**

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2016.

Fifth Semester

Mechanical Engineering

ME 2305/ME 55/ME 1305/10122 ME 506 — APPLIED HYDRAULICS AND PNEUMATICS

(Common to Sixth Semester Mechatronics Engineering and Fifth Semester Mechanical and Automation Engineering)

(Also common to 080120027 – Hydraulics and Pneumatics Systems)

(Regulations 2008/2010)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define Reynold's Number.
2. List the general types of hydraulics fluids.
3. Why cushioning mechanism is needed for hydraulic cylinders?
4. List the merits and demerits of gear pump.
5. Draw the symbol of shuttle valve and write its use.
6. Why flow control valve is essential in hydraulic circuits?
7. What are the functions of the regulator in pneumatic systems?
8. When synchronizing circuit is required?
9. What is meant by servo systems?
10. List the uses of ladder diagrams.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain the applications of fluid power system with example, list its merits and demerits. (8)
- (ii) Explain the fluid characteristics of fluid used in hydraulic system. (8)

Or

- (b) (i) Write short notes:
- (1) Laminar flow
- (2) Turbulent flow
- (3) Pascal's law applications. (6)
- (ii) List the various valves and fittings used in hydraulic systems. Explain their associative losses and its preventions. (10)
12. (a) Explain with suitable sketch the working of radial and axial Piston pumps. (16)

Or

- (b) (i) With neat sketch explain the construction of Telescopic cylinder and state its application with example. (12)
- (ii) What is meant by rodless cylinder? State its application. (4)
13. (a) Classify the direction control valves in terms of position and explain each with neat circuits. (16)

Or

- (b) What is the functions of a throttle valve? Draw and explain the meter in meter out and bleed -off circuits. (16)
14. (a) Draw the layout of the complete pneumatic system and explain its subsystem. (16)

Or

- (b) Draw a sequential pneumatic circuits for the following sequence A + A - B + C + B - C - using cascade method. (16)

15. (a) (i) Explain the working of electro hydraulic servo systems with neat sketch. (10)
- (ii) What is meant by fluidics? Name some fluidic devices and its uses. (6)

Or

- (b) (i) Two double-acting pneumatic cylinders A and B, with double - solenoid valves have to work in the following sequences - A+, B+, A-, B-. Draw a ladder diagram and indicate the input and output devices. Both the cylinders have limit switches. (10)
- (ii) Write short notes on failure and trouble shooting in pneumatic circuits. (6)
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