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Question Paper Code : 51858

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 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. Name three basic methods of transmitting power.
2. Give the Darcy's equation. What is the use of it ?
3. Differentiate between fixed displacement and variable displacement pumps.
4. How do you rate/specify a hydraulic motor ?
5. What do you mean by Position Valves ?
6. Define the term extensifier ratio.
7. What are the uses of rotary air motors & vane air motor ?
8. What are the methods for controlling the speed of a hydraulic actuator ?
9. What is fluidics ?
10. Define the terms 'lap' and 'null' with respect to servo valves.

PART – B (5 × 16 = 80 Marks)

11. (a) (i) List out the applications of fluid Power employed in different industries/fields. (10)
(ii) List the precautions to be taken when mineral oil based fluid changed into fire resistant fluid. (6)

OR

- (b) (i) State Pascal's law and Explain. (8)
(ii) Write a short note on the following :
(1) Laminar and turbulent flow (4)
(2) Energy losses in Valves and fittings (4)

12. (a) With a neat sketch, explain the principle and operation of a vane pump. Also derive an expression for the output of the vane pump. (16)

OR

- (b) (i) Explain with neat sketch the principle of operation of telescopic cylinder. (8)
(ii) Write short notes on the following linear actuators :
(1) Tandem Actuators (4)
(2) Double Rod cylinders (4)

13. (a) (i) List out the drawbacks that limit their use in hydraulic systems. (8)
(ii) Explain the principle of a sliding-spool type 4/2 DC Valve. (8)

OR

- (b) (i) With the use of a ladder diagram. Explain how a solenoid valve and a limit switch control the operation of a double-acting hydraulic cylinder. (10)
(ii) Write short note on the globe and needle flow control valves. (6)

14. (a) (i) Explain Filter regulator Lubricator unit used in Pneumatic circuits. (10)
(ii) Explain Quick exhaust valves. (6)

OR

- (b) (i) Draw and explain synchronizing circuit. (10)
(ii) What are three major considerations of fluid power circuit design ? (6)

15. (a) (i) Explain the construction and operation of a two-stage electro hydraulic servo valve. (10)
(ii) What is a SRT flip-flop? Explain how it works ? (6)

OR

- (b) (i) Draw and explain - timing chart for a Pneumatic system. (8)
(ii) What is PLC ? Explain the function of three basic elements of PLC ? (8)