Reg. No.

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 values.

PART – B (5 × 16 = 80 Marks)

11. (a) (i) List out the applications of fluid Power employed is 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 consideration 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 - branding chart for a Pneumatic system. **(8)**
    (ii) What is PLC ? Explain the function of three basic elements of PLC ? **(8)**

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