Reg. No. \_\_\_\_\_\_\_\_\_\_\_\_\_



**End Semester Examination – Nov / Dec – 2019**

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| **Code :** | **17ME2026** | **Duration :** | **3 hrs** |
| **Sub. Name :** | **FLUID POWER CONTROL ENGINEERING** | **Max. Marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Define the term fluid power. | CO1 | 2 |
| b. | Classify hydraulic pumps. | CO1 | 4 |
| c. | List out the advantages, disadvantages and applications of fluid power systems. | CO1 | 6 |
| d. | Discuss the basic elements of a hydraulic system with simple circuit. | CO3 | 8 |
| **(OR)** | | | | |
| 2. | a. | Discuss the working principle of vane pump. | CO2 | 6 |
| b. | A hydraulic motor has a displacement of 164 cm3 and operates with a pressure of 70 bars and a speed of 2000 rpm. If the actual flow rate consumed by the motor is 0.006m3/s and the actual torque delivered by the motor is 170 N-m. Find (i) Volumetric, Mechanical and Overall efficiencies of the motor and (ii) the actual power delivered by the motor. | CO3 | 8 |
| c. | Discuss the working of Gear motor with neat sketch. | CO3 | 6 |
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| 3. | a. | For a crane system given in figure.1, draw the free body diagram and find the cylinder force required to lift a load of 20kN.    Figure.1. Crane System | CO3 | 6 |
| b. | Discuss the function and construction of the fluid reservior with neat sketch. | CO3 | 10 |
| c. | Illustrate the various spool switching mechanism of DCVs. | CO3 | 4 |
| **(OR)** | | | | |
| 4. | a. | List the function of an accumulator. | CO2 | 2 |
| b. | Classify various types of accumulators. | CO2 | 4 |
| c. | Discuss the working of any three accumulators with neat sketches. | CO2 | 14 |
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| 5. | a. | Draw and explain the working of the hydraulic sequencing circuit. | CO4 | 8 |
| b. | Discuss the any two types of speed control circuits for a hydraulic double acting cylinder. | CO4 | 12 |
| **(OR)** | | | | |
| 6. | a. | Demonstrate the working of hydraulic press circuit. | CO4 | 8 |
| b. | Discuss any two types of synchronizing circuits for a hydraulic double acting cylinder. | CO4 | 12 |
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| 7. | a. | Discuss the working of screw compressor with a neat diagram. | CO5 | 8 |
| b. | Explain the working of one way flow control valve with its application in a pneumatic circuit. | CO5 | 8 |
| c. | Draw the symbol for the following:  i) FRL unit ii) 3/2 DCV  iii) Double acting cylinder iv) Pneumatic motor | CO1 | 4 |
| **(OR)** | | | | |
| 8. | a. | Design and explain a pneumatic circuit for quick return movement of the piston of double acting cylinder. | CO5 | 10 |
| b. | Design and develop a pneumatic circuit for two cylinders with the sequence of A+B+A-B-. | CO5 | 10 |
|  | | **Compulsory**: |  |  |
| 9. | a. | Discuss briefly about various the fluidic logics. | CO6 | 4 |
| b. | Discuss the architecture of PLC. | CO6 | 8 |
| c. | Design a Fluidic box-sorting system circuit and explain the control of a conveyor that moves and fills container. | CO6 | 8 |