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

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**End Semester Examination – Nov/Dec– 2018**

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| **Code :** | **14ME2007** | **Duration :** | **3hrs** |
| **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. | List five fields of application of fluid power. | CO1 | 4 |
| b. | Oil with a kinematic viscosity 0.45 X 10-4 m2/s is flowing through a 50 mm diameter pipe at 1900 lit/min. Is the flow laminar or turbulent? | CO2 | 4 |
| c. | Draw a graphical symbol and label the ports for pneumatic  (i) four way, two position DCV (ii) Five way, two position DCV. | CO2 | 12 |
| (OR) | | | |  |
| 2. | a. | What is the main difference between a open-loop and closed-loop fluid power system? | CO1 | 4 |
| b. | Oil with a specific gravity of 0.85 and a kinematic viscosity of 1.932 X 10-4 m2/s is flowing through a 50 mm diameter commercial steel pipe at the rate of 3500 lit/min. What is the pressure drop in 150 m. | CO2 | 6 |
| c. | Discuss the different types of pneumatic valves with neat sketch. | CO1 | 10 |
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| 3. | a. | With the help of neat diagram, explain the working of unbalanced vane pump. |  | 10 |
| b. | A positive displacement pump has an overall efficiency of 87% and volumetric efficiency of 93%. What is its mechanical efficiency? | CO1 | 5 |
| c. | Draw a two step feed control circuit and explain it functions. | CO1 | 5 |
| (OR) | | | |  |
| 4. | a. | Briefly explain the working of time delay pneumatic valve. | CO1 | 10 |
| b. | Classify the pneumatic cylinders based on operating principle. | CO1 | 5 |
| c. | Differentiate between fixed displacement and variable displacement pumps. | CO2 | 5 |
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| 5. | a. | What is a ladder diagram? | CO2 | 5 |
| b. | Name the major classification of separator accumulator. | CO2 | 5 |
| c. | A hydraulic motor has a displacement of 150 cm2 and operates with a pressure of 120 bar and a speed of 250 rpm. The actual flow rate consumed by the motor is 0.00781 m3/s and the actual torque delivered by the motor is 250 N-m. Find the (i) volumetric efficiency (ii) mechanical efficiency (iii) power delivered by the motor. | CO4 | 10 |
| (OR) | | | |  |
| 6. | a. | How does a limit switch differ from a push button switch? | CO1 | 5 |
| b. | Explain servo valve and its function in a hydraulic system. | CO2 | 5 |
| c. | A receiver must supply air to a pneumatic system at a rate of 0.5 standard m3/min for 5 min between 8.5 bar and 7 bar. If the size of the reservoir is 1 m3 how many standard m3/min of air must the compressor possible? | CO3 | 10 |
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| 7. | a. | Write a short notes on (i) back pressure sensor (ii) proximity sensor. | CO1 | 10 |
| b. | Explain Coanda effect. | CO2 | 5 |
| c. | Differentiate between single acting and double acting cylinder. | CO1 | 5 |
| (OR) | | | |  |
| 8. | a. | Draw the symbol of OR and AND elements and its truth table. | CO3 | 10 |
| b. | Explain fluidic container filling system. | CO1 | 10 |
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|  | | **Compulsory**: |  |  |
| 9. | a. | Draw and explain a hydraulic operation circuit for a planning machine. | CO4 | 10 |
| b. | Explain Intensifier circuit with neat diagram. | CO2 | 10 |