1278

Code : 15ME41T

Register Number | | | | | | | |

IV Semester Diploma Examination, Nov./Dec. 2017

HYDRAULICS AND PNEUMATICS

Time : 3 Hours | **| Max. Marks : 100**

Note : Answer any **six** from Part – **A** and **seven** from Part – **B**.

PART – A

1. Define the following terms : **5**
   (i) Density
   (ii) Specific weight
   (iii) Viscosity

2. Define atmospheric pressure, gauge pressure & absolute pressure. Write the relation between them. **5**

3. State Bernoulli's theorem and mention the assumptions made. **5**

4. Explain Hydraulic gradient line and total gradient line. **5**

5. Define a turbine and classify them. **5**

6. Explain priming of pumps. **5**

7. Draw the Block diagram of Pneumatic system and label the parts. **5**

8. Explain hydraulic spring loaded accumulator. **5**

9. List the advantages of hydraulic system. **5**

PART – B

10. (a) Explain surface tension. 5

(b) Explain simple manometer. 5

11. (a) State the equation of continuity of flow. 4

(b) A horizontal venturimeter has inlet and throat diameters of 300 mm and 150 mm respectively is used to measure the flow of water. The reading of differential mercury manometer is 200 mm. 6

Determine the rate of flow in lit/sec, take C = 0.98

12. (a) Explain total energy of a Liquid particle. 4

(b) A horizontal pipe having diameters 200 mm and 100 mm at sections (1) and (2) respectively. If the velocity of water at section (1) is 4 m/s. Find at section (2) 6

(i) Velocity of water

(ii) Velocity head

(iii) Discharge

13. (a) State Chezy's equation. 4

(b) Find the maximum power transmitted by a pipe to a power station of 3 kms long and 200 mm diameter. The pressure of water in power station is 1500 kPa and t = 0.01. 6

14. A Pelton wheel develops 13,000 kW at 430 rpm. If the overall efficiency is 85% at a head of 100 m. Determine the following : 10

(a) Discharge

(b) Dia. of wheel

(c) Dia. of jet

(d) No. of Buckets

(e) Width & depth of buckets

Assume v = 0.46 V

Coefficient of discharge = C_v = 0.98

15. (a) Explain Slip and Negative Slip. 4

(b) A double acting reciprocating pump of stroke 300 mm and piston diameter is 150 mm. Pre delivery and suction head of 26 m and 4 m respectively. If the pump runs at 60 rpm. Find the power required to drive the pump with efficiency 60%. 6

16. (a) Sketch and explain gear pump. **5**

(b) Explain $\frac{5}{2}$ DC valve & its uses. **5**

17. (a) List the areas of applications of hydraulic system. **5**

(b) Write the symbols for the hydraulic components. **5**

(i) Double acting cylinder

(ii) 4/2 DC valve

(iii) Check valve with spring

(iv) Spring loaded accumulator

(v) Fixed displacement unidirectional pump

18. (a) Explain lubricator. **5**

(b) Explain double acting cylinder working. **5**

19. (a) Define an air motor and mention types. **5**

(b) Explain non-return or check valve. **5**