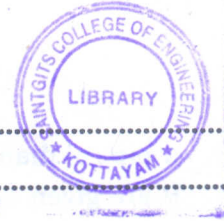


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Reg. No.....

Name.....



**B.TECH. DEGREE EXAMINATION, NOVEMBER 2014**

**Third Semester**

Branch : Electrical and Electronics Engineering

**MECHANICAL TECHNOLOGY (E)**

(Old Scheme—Prior to 2010 Admissions)

(Supplementary/Mercy Chance)

Time : Three Hours

Maximum : 100 Marks

**Part A**

*Answer all questions.*

*Each question carries 4 marks.*

1. What is the importance of compressibility in fluid flow ?
2. What are the applications of pressure switches ?
3. List the different forces present in a fluid flow.
4. Differentiate between isentropic and adiabatic process.
5. Define the term "governing of a turbine".
6. What is meant by the speed ratio of a pelton wheel ?
7. What do you mean by static discharge head of a centrifugal pump ?
8. State the significance of similarity parameters in hydraulic pumps.
9. What are the advantages of using root pumps ?
10. Why is the speed of a reciprocating pump without air vessel not high ?

(10 × 4 = 40 marks)

**Part B**

*Answer all questions.*

*Each question carries 12 marks.*

11. Derive the relationship between Bulk modulus (K) and pressure (P) for a gas for (i) isothermal process and (ii) adiabatic process.

*Or*

12. With neat sketches, explain the working of (i) single column manometer and (ii) U-tube manometer.

**Turn over**

13. A pipe of diameter 30 cm carries water at a velocity of 20 m/sec. The pressures at points A and B are given as  $34.335 \text{ N/cm}^2$  and  $29.43 \text{ N/cm}^2$  respectively, while the datum head at A and B are 25 m and 28 m. Find the loss of head between A and B.

Or

14. What is a venturimeter ? Derive an expression for the discharge through a venturimeter.
15. A water turbine has a velocity of 6 m/s at the entrance to the draft tube and a velocity of 1.2 m/s at the exit. For friction losses of 0.1 m and a tail water 5 m below the entrance to the draft tube, find the pressure head at the entrance.

Or

16. A turbine develops 7357.5 kW S.P. when running at 200 r.p.m. The head on the turbine is 40 m. If the head on the turbine is reduced to 25 m. determine the speed and power developed by the turbine.
17. Discuss the principles of working, efficiency, performance curves and applications of (i) jet pump and (ii) air lift pump.

Or

18. Find the number of pumps required to take water from a deep well under a total head of 156 m. Also the pumps are identical and are running at 1000 r.p.m. The specific speed of each pump is given as 20, while the rated capacity of each pump is 150 litres/s.
19. What is an indicator diagram ? Discuss the effect of acceleration and friction in suction and delivery pipes on the indicator diagram.

Or

20. A single acting reciprocating pump has a stroke length of 15 cm. The suction pipe is 7 m long and the ratio of suction diameter to plunger diameter is  $3/4$ . The water level in the sump is 2.5 m below the axis of pump cylinder, and the pipe connecting the sump and pump cylinder is 7.5 cm diameter. If the crank is running at 75 r.p.m., determine the pressure head on piston in the middle of the suction stroke.

(5 × 12 = 60 marks)

