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Total No. of Pages : 02

Total No. of Questions : 18

B.Tech (ME) (2018 Batch) (Sem.-4)

**FLUID MACHINES**

Subject Code : BTME-402-18

M.Code : 77547

Time : 3 Hrs.

Max. Marks : 60

**INSTRUCTIONS TO CANDIDATES :**

1. SECTION-A is COMPULSORY consisting of TEN Multiple Choice questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

**SECTION-A****Write briefly :**

- Q1. What is the meaning of degree of reaction?
- Q2. What is draft tube?
- Q3. What is need of priming of a pump?
- Q4. What is effect of cavitation?
- Q5. What is scale effect?
- Q6. What is fluid coupling?
- Q7. What do you understand by governing of a Pelton turbine?
- Q8. Define Negative Slip in reciprocating pump.
- Q9. What is hydraulic accumulator?
- Q10. What are vane pumps?



**SECTION-B**

- Q11. A turbine is to operate under a head of 25 m at 200 r.p.m. The discharge is  $9 \text{ m}^3/\text{s}$ . If the overall efficiency is 90 percent. Determine :
- a) Power generated
  - b) Specific speed of the turbine
  - c) Type of turbine.
- Q12. With the aid of a sketch explain the working of a Hydraulic Accumulator.
- Q13. Derive the expression for maximum hydraulic efficiency of a Pelton wheel.
- Q14. Explain why the suction lift of a pump cannot exceed certain limit?
- Q15. The impeller of a centrifugal pump is 1m in diameter and rotates at 1500 rpm. The blades are curved backward and make an angle of  $30^\circ$  to the tangent at the periphery. Calculate the power required if the velocity of the flow at outlet is 20m/s. Determine the head to which water can be lifted when a diffuser casing reduces the outlet velocity to 60%.

**SECTION-C**

- Q16. Derive expression for the force exerted by the jet of water on a series moving flat plate placed on the periphery of a wheel. Also find the maximum efficiency?
- Q17. A Pelton turbine is required to produce 6MW power when working under a head of 300m. The turbine r.p.m. is 550 and the overall efficiency is 0.85. The turbine works with three jets. Determine :
- a) The diameter of the runner
  - b) Discharge per second
  - c) Diameter of the jet
  - d) Number of buckets.
- Q18. Explain the principle of operation, construction and working of a centrifugal compressor with necessary sketches.

**NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.**