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Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(ME) (2012 Onwards) (Sem.-6)**FLUID MACHINERY****Subject Code : BTME-603****M.Code : 71187****Time : 3 Hrs.****Max. Marks : 60****INSTRUCTION TO CANDIDATES :**

1. **SECTION-A** is **COMPULSORY** consisting of **TEN** 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**1. Answer briefly :**

- a. What is Euler's equation for energy transfer in turbomachine?
- b. How Vane efficiency is calculated?
- c. Classify hydraulic turbines based on the direction of water flow through runner with example of turbine.
- d. Draw few commonly used draft tubes.
- e. What is difference between inward and outward radial flow reaction turbines?
- f. Define Mechanical Efficiency of turbine.
- g. Mention few systems which use intensifier as their basic element.
- h. Define Unit Speed of a turbine.
- i. What is the use of runner?
- j. Define Specific Speed of a pump.

SECTION-B

2. Derive an expression for force exerted by a jet of water on a fixed vertical plate in the direction of the plate.
3. A centrifugal pump with impeller diameter 20cm at outlet and width of outlet passage 2cm has swept back blades at 25° to the tangent to the periphery. Calculate the flow rate and power requirement while operating at 300rpm under the condition of optimum performance.
4. Define and explain hydraulic efficiency, mechanical efficiency and overall efficiency of a turbine.
5. What are the factors, which influence the speed of a reciprocating pump?
6. What is cavitation? Deduce expression for Thomas cavitation number.

SECTION-C

7. A Pelton wheel develops 6000 kW shaft power at 200rpm when operating under a head of 225 m. Overall efficiency of turbine is 85%. Find its unit speed, unit discharge and unit power. If it is tested at a site having supply head 150m with maximum tachometer speed available at 200 rpm, then also determine speed, discharge and power of wheel under changed head.
8. Define the term degree of reaction and explain it in terms of slow medium and fast runner. Can a turbine attain 100% degree of reaction?
9. Write short notes on :
 - a. Fluid coupling
 - b. Hydraulic ram

NOTE : Disclosure of identity by writing mobile number or making passing request on any page of Answer sheet will lead to UMC case against the Student.