Visit: www.brpaper.com for
B-Tech,Diploma,BCA,BBA,MBA,MCA,Bsc-IT,
Msc-IT,M-tech, Distance-Education,B-com.

Roll No. .....

Total No. of Questions : 09] [Total No. of Pages : 02

B.Tech. (Sem. - 6th)

FLUID MACHINERY

SUBJECT CODE : ME - 306

Paper ID : [A0821]

[Note : Please fill subject code and paper ID on OMR]

Time : 03 Hours **Maximum Marks : 60**

Instruction to Candidates:

1) Section - A is **Compulsory**.
2) Attempt any **Four** questions from Section - B.
3) Attempt any **Two** questions from Section - C.

Section - A

Q1) *(10 × 2 = 20)*

a) What is Impulse Momentum Principle?

b) What is meant by degree of reaction?

c) If the specific speed of a Pelton turbine having single jet is 16, what will be its value if the number of similar jets is 4.

d) Why the number of blades in Kaplan turbine is less?

e) Name the turbine in which cavitation does not take place.

f) What are the advantages of using Air vessels?

g) What is thoma cavitation factor.

h) Differentiate between fluid coupling and torque convertor.

i) For a part load operation, which turbine is recommended.

j) Which pump would you recommend for using as a feed pump in a power plant?

www.brpaper.com

Visit: www.brpaper.com for
B-Tech,Diploma,BCA,BBA,MBA,MCA,Bsc-IT,
Msc-IT,M-tech, Distance-Education,B-com.

Section - B

(4 × 5 = 20)

Q2) The rotor of an inward flow turbine has a dia. of 100 cm at the tip of blades and 80cm at the bottom of blades and runs at 300 rpm. Water enters the fixed waves at 12° to the tangent to outer circumference with a velocity of 12 m/s. Find the blade angles at entry and exit if water enters and leaves without shock. The water leaves the blades with radial velocity of 4m/s.

Q3) (a) Discuss the various losses in a hydraulic turbine.

(b) Distinguish between Impulse and Reaction turbines.

Q4) Find the power and wave angle at exit of Francis turbine with the following data:

Head - 75m; hyd. n - 0.92; overall n = 0.86

runner diameters 1m and 50 cm; Blade angle at inlet - 18°; runnerwidth - 15 cm.

Assume runner waves are set normal to periphery at inlet.

Q5) (a) Find an expression for maximum inertia head in a reciprocating pump without air vessel.

(b) A double acting reciprocating pump having piston area of 0.1 m^2 has a stroke of 30 cm. If discharges 2.4 m^3/ minute through a height of 10 m. Find the speed and power required to drive the pump. The slip of the pump is 0.005m^3/sec.

Q6) (a) Make a neat sketch of a torque convertor and explain its working.

(b) What are functions of Surge tanks. Explain any one type in detail.

Section - C

(2 × 10 = 20)

Q7) Show that in general for a centrifugal pump running at N rpm giving a discharge of Q, the manometric head can be expressed in the form

$Hm = AN^2 + BNQ + CQ^2$

where A, B and C are constants.

Q8) (a) Show that Pelton turbine is a low specific speed turbine.

(b) A Kaplan turbine produces 60,000kW under a head of 25m with overall n of 90%. If speed ratio is 1.6 and flow ratio is 0.5, find dia and speed of turbine. Take hub dia as 0.35 times the outer diameter.

Q9) (a) Discuss the working of a jet pump with the help of a neat sketch.

(b) A single stage centrifugal pump with impeller diameter of 30 cm rotates at 2000 rpm and lifts 3m^3/s of water to a height of 30m with n of 75%. Find the number of stages of a similar multistage pump to lift 5 m^3/s of water to a height of 200 *m* when rotating at 1500 rpm.

www.brpaper.com