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CODE: 13ME2008

ADITYA INSTITUTE OF TECHNOLOGY & MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B. Tech. I Semester Supplementary Examinations, March, 2015
FLUID MECHNICS & HYDRAULIC MACHINES
(**Electrical and Electronics Engineering**)

Time: 3 Hours   Max Marks: 70

PART – A

Answer all questions   [1X10=10M]

1. a. State Newton's law of Viscosity.
   b. What is the difference between Absolute pressure and Gauge pressure
   c. Distinguish between Steady and Unsteady flows.
   d. Define Velocity potential and Stream functions.
   e. List out the minor losses occurring in flow through pipes.
   f. State the principle on which Venturimeter is working?
   g. Define Hydraulic efficiency as applied to Hydraulic turbines?
   h. What are the functions of draft tube?
   i.   Define Manometric efficiency of a Centrifugal pump?
   j. Define Slip and Negative Slip of a reciprocating pump?

PART-B

Answer one question from each unit   [5 X12 = 60M]
UNIT-I

2. (a) Define surface tension and Derive the expression for pressure intensity of a liquid droplet?
   [6 M]

   (b) The space between two square flat parallel plates is filled with oil. Each side of the plate is 60 cm. The thickness of the oil film is 12.5 mm. The upper plate which moves at 2.5 m/s requires a force of 98.1 N to maintain the speed. Determine a) dynamic viscosity, b) kinematic viscosity. Take specific gravity=0.95   [6 M]

(OR)

3. (a) State and Prove Pascal's law?   [6 M]
   (b) A simple U-tube manometer containing mercury is connected to a pipe in which a fluid of specific gravity 0.8 and having vaccum pressure is flowing. The other end of the manometer is open to atmosphere. Find the vaccum pressure in pipe, if the difference of mercury level in the two limbs is 40 cm and the height of fluid in the left limb from the centre of the pipe is 15 cm below.   [6 M]

UNIT - II

4. A 30 cm diameter pipe, conveying water, branches into two pipes of diameters 20 cm and 15 cm respectively. If the average velocity in the 30 cm diameter pipe is 2.5 m/s, find the discharge in this pipe. Also determine the velocity in 15 cm pipe if the average velocity in 20 cm diameter pipe is 2 m/s.   [12 M]

1-2

(OR)

5. A pipe of 300 mm diameter conveying 0.3 m^3/s of water has a right angled bend in a horizontal plane. Find the resultant force exerted on the bend if the pressure at inlet and outlet of the bend are 24.525N/cm^2 and 23.544 N/cm^2 [12 M]

UNIT – III

6. (a) Derive Darcy-Weisbach equation for head loss due to friction. [6 M]
   (b) The difference in water surface levels in two tanks, which are connected by three pipes in series of lengths 300 m, 170 m and 210m and diameters 300 mm, 200 mm and 400 mm respectively, is 12 m. Determine the rate of flow of water if co-effcient of friction are 0.005, 0.0052 and 0.0048 respectively, neglecting minor losses. [6 M]

(OR)

7. Derive the equation for coefficient of discharge through a Venturimeter [12 M]

UNIT - IV

8. (a) Give a detailed classification of Hydraulic turbines. [8 M]
   (b) A turbine develops 7225 kW power under a head of 25 m at 135 rpm. Calculate the specific speed of the turbine. [4 M]

(OR)

9. A Kaplan turbine runner is to be designed to develop 9100 kW. The net available head is 5.6 m. If the speed ratio is= 2.09, flow ratio = 0.68, overall efficiency 86% and the diameter of the boss is 1/3 the diameter of the runner. Find the diameter of the runner, its speed and the specific speed. [12 M]

UNIT - V

10. Briefly explain the working of a Centrifugal pump with a neat sketch [12 M]

(OR)

11. The cylinder bore diameter of a single acting reciprocating pump is 150 mm and its stroke is 300 mm. The pump runs at 50 rpm and lifts water through a height of 25 m. Find the theoretical discharge and the theoretical power required to run the pump. If the actual discharge is 4.2 litres/s, find the slip and percentage slip. [12 M]

2-2

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ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech I Semester Supplementary Examinations, March, 2015
ELECTRICAL TECHNOLOGY
(Electronics and Communication Engineering)

Time: 3 Hours   **Max Marks: 70**
PART – A
Answer all questions   **[1X10=10M]**
 1. Define the following
- a. Armature reaction
- b. Critical field resistance
- c. Speed regulation
- d. Pitch factor
- e. Distribution factor
- f. Slip
- g. Ideal transformer
- h. Controlling torque
- i. Deflecting torque
- j. Relative speed

PART-B

Answer one question from each unit   **[5 X12 = 60M]**

UNIT-I

2. Explain the working and construction of DC generator with neat sketch?   [12M]

(OR)

3. What are the different methods used to control the speed of DC series motors explain each of them?   [12M]

UNIT-II

4. a) Derive an E.M.F equation of a transformer?   [6M]

   b) Draw and explain Phasor diagram of transformer under loaded condition.   [6M]

(OR)

5. Obtain the approximate equivalent circuit of a 200/2000V single phase 30KVA transformer having the following test results:
   O.C test: 200V, 5.8A, 300W on LV side
   S.C test: 75V, 16A, 800W on HV side.   [12M]

UNIT-III

6. Explain the effect of slip on rotor current and derive the condition for maximum torque? [12M]

(OR)

7. Explain the working principle of induction motor with neat diagram? [12M]

UNIT-IV

8. A 1500KVA, 6.6kv, 3 phase, star connected alternator has a resistance of 0.5ohm per phase and a synchronous reactance of 5ohm per phase. Find its voltage regulation for (i) Unity p.f (ii) 0.8 lagging p.f (iii) 0.8 leading p.f [12M]

(OR)

9. Explain the Synchronous impedance method for find the voltage regulation of alternator.
[12M]

UNIT –V

10. What are the essential requirements for the indicating instruments, explain each of them?
[12M]

(OR)

11. a) A Permanent magnet moving coil instrument gives full scale reading of 25mA when a p.d across its terminals is 75mV. Show how it can be used (i) as an ammeter for a range of (0-100)A (ii) as a voltmeter for a range of (0-750)V. Also find the multiplying power of the shunt and voltage amplification. [6M]

b) What are the advantages and disadvantages of PMMC Instrument? [6M]