AR 13 SET 01

CODE: 13ME2008

ADITYA INSTITUTE OF TECHNOLOGY & MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B. Tech. I Semester Regular Examinations, January, 2015
FLUID MECHNICS & HYDRAULIC MACHINES
(ELECTRICAL AND ELECTRONICS ENGINEERING)

Time: 3 Hours **Max Marks: 70**

PART – A

Answer all questions **[1X10=10M]**

1. a) Differentiate between Absolute pressure and gauge pressure.
   b) Write the Euler's equation of motion.
   c) Define stream line, path line and streak lines.
   d) Distinguish between rotational flow and irrotational flow.
   e) Write principle of momentum ?
   f) What do you understand by total energy line and hydraulic gradient line?
   g) What do you mean by fundamental units and derived units?
   h) What are the uses of a draft tube?
   i) What is priming? Why it is necessary?
   j) Define suction head and delivery head.

PART-B

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

UNIT-I

2. A 1.9mmdiameter tube is inserted into an unknown liquid whose density is 960 kg/m^3, and it is observed that the liquid rises 5 mm in the tube, making a contact angle of 15°.Determine the surface tension of the liquid. There are no impurities in the liquid, and no contamination on the surfaces of the glass tube. The liquid is open to the atmospheric air. [12M]

(OR)

3. Determine the gage pressure at point A in Fig.1, in Pascals. Is it higher or lower than P_{atm}?

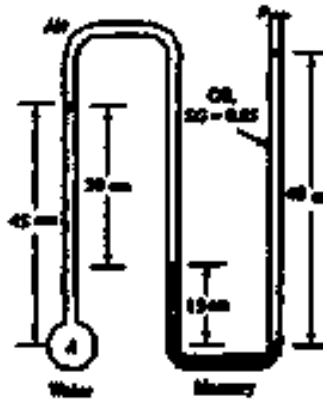

Fig.1 [12M]

UNIT – II

4. Write the Bernoulli's statement and write the assumptions in it. Derive the expression for Bernoulli's equation. [12M]

(OR)

5. A two dimensional velocity field is given by $u = -Ky/(x^2+y^2)$ and $v = Kx/(x^2+y^2)$, where K is constant. Does this field satisfy incompressible continuity? [12M]

UNIT – III

6. Define an orifice-meter. Derive an expression for the discharge through a orifice-meter [12M]

(OR)

7. A 30cm× 15 cm venturimeter is inserted in a vertical pipe carrying water,flowing in the upward direction. A differential manometer connected to the inlet and throat gives a reading of 20cm.Find the discharge. Take C_d= 0.98. [12M]

UNIT – IV

8. Derive an expression for maximum efficiency of the Pelton Turbine? [12M]

(OR).

9. A Francis turbine with an overall efficiency of 75% is required to produce 148.25KW power.It is working under a head of 7.62m.The peripheral velocity is 3.179m/s and the radial velocity of flow at inlet is 11.738m/s.The wheel runs at 150 rpm and the hydraulic losses in turbine are 22% of the available energy. Assuming radial discharge,determine: i) the guide blade angle ii) The wheel vane angle iii)Diameter of the wheel at inlet and iv) width of the wheel at inlet. [12M]

UNIT – V

10. 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 25m. The delivery pipe is 22m long and 100 mm in diameter. Find the theoretical discharge and theoretical power required to run the pump.If actual discharge is 4.2 litres/s. Find the percentage slip. [12M]

(OR)

11. Why are centrifugal pumps used sometimes in series and sometimes in parallel? Draw and discuss characteristics curves for a centrifugal pump [12M]

AR13 SET 02

CODE: 13EE2008

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

II B.Tech. I Sem. End Examinations, January, 2015
ELECTRICAL TECHNOLOGGY
(ELECTRONICS AND COMMUNICATION ENGINEERING)

Time: 3 Hours **Max. Marks: 70**

PART – A

Answer all questions **[1X10=10M]**

1. Describe the following
   a) Significance of three point starter.
   b) Advantages of Swinburne's test
   c) Equivalent circuit of a Transformer referred to primary.
   d) Use of breather in transformer.
   e) Slip and Slip speed.
   f) Parameters influencing the torque of an induction motor.
   g) Faraday's Laws of Electromagnetic Induction.
   h) Synchronous reactance.
   i) What is the main difference between Moving coil and Moving iron instruments.
   j) Deflecting torque.

PART-B

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

UNIT-I

2. With reference to OCC of a dc generator, explain the following:
   i. Why is the emf not zero when field current is zero?
   ii. Will the residual flux induce a voltage in the machine, if speed of the machine is zero?
   iii. Why does the slope of the curve change, after a certain value of field current?

(OR)

3. What are the different methods of speed control of dc shunt motor and explain any one of them in detail.

UNIT-II

4. Explain the construction details of the transformer. Also explain no load working of transformer with phasor diagram.

(OR)

5. With neat circuit diagrams, explain the procedure for conducting OC and SC tests on a given single - phase transformer to determine the regulation for lagging and leading power factors.

UNIT-III

6. Explain the principle of operation of a single phase induction motor.

(OR)

7. a). The frequency of emf in the stator of a 4-pole induction motor is 50Hz, and that in the rotor is 1.5Hz. Compute i). Slip ii). Rotor speed.
   b). Compare squirrel cage and slip ring induction motor with neat sketch. .

UNIT-IV

8. Explain the constructional details and principle of operation of a synchronous machine.

(OR)

9. Derive the emf equation of an alternator and explain the effect of coil span factor and distribution factor on the induced emf.

UNIT-V

10. Describe the method of damping used in these instruments.

(OR)

11. Sketch and describe the construction of a Moving Coil Ammeter and give the principle of operation. Also discuss its advantages and disadvantages.

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