

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech II Year II Semester Supplementary Examinations May/June-2024
HYDRAULICS & HYDRAULIC MACHINERY

(Civil Engineering)

Time: 3 Hours

Max. Marks: 60

(Answer all Five Units 5 x 12 = 60 Marks)

UNIT-I

- 1 Determine the expression for the most economical depth of water in terms of the diameter of a channel of circular cross-section for maximum discharge. CO1 L1 12M

OR

- 2 The discharge of water through a rectangular channel of width 8m, is 15m³/sec. When the depth of flow of water is 1.2m. calculate: (i) specific energy of the flowing water (ii) critical depth and critical velocity (iii) value of minimum specific energy. CO1 L3 12M

UNIT-II

- 3 What are assumptions of gradually varied flow? Derive the Dynamic equation of gradually varied flow CO2 L2 12M

OR

- 4 What is hydraulic jump and derive the expression for depth of hydraulic jump. CO2 L2 12M

UNIT-III

- 5 Derive the expression for force exerted by a jet on stationary curved plate if jet strikes the curved plate at the Centre and at one end. CO3 L3 12M

OR

- 6 Derive the expression for force exerted by a jet of water on an unsymmetrical moving curved plate when jet strikes tangentially at one of the tips and explain the velocity triangles at inlet & outlet and also efficiency of the jet CO3 L3 12M

UNIT-IV

- 7 A Kaplan turbine runner is to be designed to develop 9100KW. The net available head is 5.6 m, If the speed ratio = 2.09, Flow ratio = 0.68, overall efficiency = 86% & diameter of the boss is 1/3 the diameter of the runner. Find the diameter of the runner and its speed and the specific speed of the turbine CO4 L4 12M

OR

- 8 What is a turbine and give the classification in detail? Give the various efficiencies. Explain Radial flow reaction turbine with a neat diagram. CO4 L3 12M

UNIT-V

- 9 What is centrifugal pump? Explain the parts of centrifugal pump and derive the condition for work done CO5 L2 12M

OR

- 10 A three stage centrifugal pump has impeller 40 cm in diameter and 2 cm wide at outlet. The vanes are curved back at the outlet at 45° and reduce the circumferential area by 10%. The manometric efficiency is 90% and overall efficiency is 80%. Determine the head generated by the pump when running at 1000 r.p.m. delivering 50 litres per second. What should be the shaft horse power? CO5 L4 12M

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