R18 Regulation

Subject code: 2P4AC

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A' Grade)

B.Tech IV Semester Supplementary Examinations, September 2023

Hydraulics & Hydraulic Machinery

(CE)

Maximum Marks: 70

Date:19.09.2023 Duration: 3 hours

Note: 1. This question paper contains two parts A and B.
2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks (10x2M=20 Marks)

1 Explain about Specific energy.
2 Classify different Types of flows with sketch
3 Define kinematic similarities.
4 Write the different types of similarities considered in hydraulic models?
5 State the principle of Angular momentum.
6 What are different surge tanks.
7 Write about work done and efficiency.
8 What are the different types of draft tube?
9 Write the classification of turbines?
10 What is Load factor?

Part-B

Answer All the following questions. (5X10M=50Marks)

11 An open channel of trapezoidal section, 2.5 m at the base and having sides inclined at 60^0 to the horizontal, has a bed slope of 1 in 500. It is found that when the flow is 1.5 m^3/s the depth of water in the channel is 0.5 m. Assuming the validity of the Manning's formula., calculate the flow when the depth is 0.7 m. (10M)

OR

12 Differentiate between uniform and non-uniform flow; laminar and turbulent flow. (10M)

13 State and explain Buckingham's pi theorem. Give one example. (10M)

OR

14 What are different types of dimensionless numbers and explain them. (10M)

15 Derive the expression for force exerted by a jet on stationary inclined flat plate and vertical plate. (10M)

OR

16 Write in detail on impact of jet on vanes? (10M)

17 Define the term unit power, unit speed and unit discharge with reference to a hydraulic turbine. And also derive the expression for these terms. (10M)

OR

18 Explain the typical layout of hydro power plants. (10M)

19 Define a centrifugal pump. Explain the working of a single -stage centrifugal pump with sketches. (10M)

OR

20 What is utilization factor and capacity factor? What are the different types of reciprocating pumps. (10M)