Code No: R22014 **R10** SET - 1

II B. Tech II Semester Supplementary Examinations, April-2018
HYDRAULICS AND HYDRAULIC MACHINERY
(Civil Engineering)

Time: 3 hours Max. Marks: 75

Answer any **FIVE** Questions
All Questions carry **Equal** Marks
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1. a) Give classification of types of flow in the following flow situations: (5M)
(i)Flow in a laboratory flume with constant depth. (ii)Flow over a spill way
(iii)Flow in a river approaching a dam (iv)Flow in a irrigation field
(v) Flood wave
b) By using Bazin's formula calculate the discharge through a rectangular channel of 4m wide having a depth of water 2m and bed slope of 1 in 1600.Assume value of K = 2 .79 (10M)

2. At the downstream end of a spill way which carries 18.29 m^3/sec of discharge a hydraulic jump is formed. Find out the depth of the jump and energy loss if the depth before jump is 0.92m. (15M)

3. a) What are dimensionless numbers .State any four dimensionless numbers. (6M)
b) Explain model and prototype relations. (4M)
c) In a model of a highway bridge constructed to a scale of 1:25,the force of water on the pier measured is 5N. Find out the force on the prototype pier. (5M)

4. a) Using the impulse momentum principle derive an expression for the force exerted by a moving jet of fluid on a stationary curved vane. (8M)
b) Discuss the practical application of the principle of hydrodynamic of force of jets. (7M)

5. a) How turbines are classified? (5M)
b) An inward flow reaction turbine has external diameter of 1.2 m and internal diameter 0.6m respectively. The velocity of flow through the runner is constant and is equal to 1.8 m/s .Find out (i) the discharge through the runner and (ii)width of the outlet if the width of inlet is 200mm. (10M)

6. a) Define the term governing of a turbine .Describe with a neat sketch the working of an oil pressure governer. (7M)
b) Discuss how the exact behavior and performance of a turbine can be studied by the use of characteristic curves. (8M)

7. a) What is cavitation in centrifugal pumps? What are its effects? State necessary precautions against it. (6M)
b) Determine the number of pumps required to lift water from a deep well under a total head of 126m. All the pumps are identical and running at 710 r.p.m. The rated capacity of each pump is 0.27 m^3/sec and the specific speed of each pump is 21. (9M)

8. Write brief notes on: (i)Classification of Hydro Electric power plants (15M)
(ii)Estimation of power developed in a given catchment area
(iii)Storage area pondage
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