JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech IV Year I Semester Examinations, November/December - 2016

WATER RESOURCES ENGINEERING-II

(Civil Engineering)

Time: 3 Hours   Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

Note: Khosla's curves will be made available.

PART- A

(25 Marks)

1.a)   What are the various storage zones of a reservoir?   [2]
  b)   How the inflow of sediment into a reservoir can be controlled?   [3]
  c)   Write short note on uplift force on a gravity dam.   [2]
  d)   Describe the treatment commonly given to the foundation of gravity dam.   [3]
  e)   What are the seepage failures of earth dam?   [2]
  f)   How hydraulic jump is created when hydraulic jump curve is higher than the tail water curve?   [3]
  g)   What is the purpose of divide wall?   [2]
  h)   What is meant by piping in the foundation of a weir?   [3]
  i)   Briefly explain the function of cross regulator.   [2]
  j)   Classify the canal modules.   [3]

PART-B

(50 Marks)

2.a)   Briefly describe reservoir sedimentation and the procedure to determine the life of a reservoir.
  b)   Classify dams based on their use.   [5+5]

OR

3.a)   Describe the procedure to determine safe yield from a reservoir of a given capacity.
  b)   Illustrate the advantages and disadvantages of an arch dam.   [5+5]

4.   The following figure gives profile of a gravity dam with reservoir level as shown. If the co-efficient of friction is 0.8 and weight density of concrete is 2.4t/m^3, check the safety of the dam against sliding, overturning and max and min vertical stress. Assume any other data not given.   [10]

7m

10m

97m

100 m

75 m
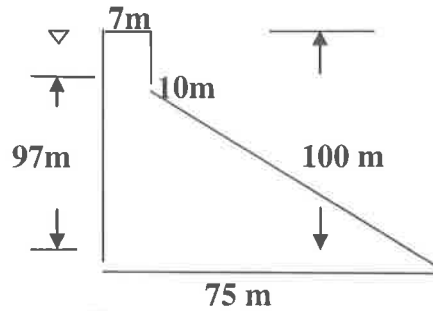
OR

5.a) Define elementary profile of dam and derive the base width of elementary profile based on stress and sliding criteria. Consider the full reservoir condition.

b) Write detailed notes on earthquake forces on gravity dams. [5+5]

6.a) Explain different types of earthen dams.

b) Describe the measures to prevent seepage failures in earth dams. [5+5]

OR

7.a) Describe various types of spillways.

b) Explain different types of spillway gates. [5+5]

8.a) Draw a neat sketch showing various components of a diversion headwork. Explain briefly the functions of each component.

b) Briefly explain Bligh's theory and discuss its limitations. [5+5]

OR

9. An horizontal impervious floor of a weir on permeable soil is 15 m long and has sheet piles at both ends. The upstream pile is 5 m deep and the downstream pile is 6 m deep. The weir creates a net head of 3.0 m. The downstream end of weir is located at a distance of 7 m from the upstream end of impervious floor. Calculate the uplift pressures at the junction of the inner faces of the pile with the weir floor, by using Khosla's theory. Also determine the thickness of apron at the downstream side of the weir. [10]

10.a) Describe various components of a canal cross regulator with a neat sketch.

b) What is meant by semi-modular outlet? Explain how APM outlet is working as semi-module outlet? [5+5]

OR

11.a) What are the various cross drainage works?

b) Write the design procedure of an aqueduct. [5+5]

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