Code No: 127JN **R15**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech IV Year I Semester Examinations, November/December - 2018
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.

PART- A
(25 Marks)

1.a) What is meant by life of a reservoir. [2]
b) Discuss different storage zones of a reservoir. [3]
c) What is meant by a gravity dam? [2]
d) Discuss the elementary profile of a gravity dam. [3]
e) Explain how earth dams resist the forces coming on to it. [2]
f) Explain JHC and TWC with neat sketches. [3]
g) Distinguish between dam, weir and barrage. [2]
h) Explain the salient features of Bligh's theory. [3]
i) When and where CD works are provided. [2]
j) What is a canal outlet? Describe the types of it. [3]

PART-B
(50 Marks)

2.a) Discuss the investigations for reservoir planning.
b) How sedimentation does occur in a reservoir. How can sedimentation be controlled?[5+5]

OR

3.a) Define reservoir. Discuss various types of reservoirs.
b) Define mass inflow curves and demand curves. Explain the procedure for finding storage capacity of a reservoir in order to meet a particular rate of demand. [5+5]

4. A concrete gravity dam 20 m in height has a top width of 9 m and a free board of 3 m. Upstream face of dam is vertical, while downstream face has a slope of 0.8 (H): 1 V right from the top of the dam. Determine (a) factor of safety against overturning, and (b) location and magnitude of maximum pressure on foundation. Neglect all other forces except those due to hydrostatic pressure, full uplift pressure and self weight. Take unit weight of concrete as 2.4 tonnes per cubic metre. [10]

OR

5. A concrete gravity dam has the following data:
Maximum water level = 120.00
Bed level = 40.00
R.L.top of dam = 124.00
The d/s slope of 0.7 :1 starts at RL of 115.00
U/s face is vertical
Central line of the drainage gallery = 7.0 m from u/s face.
Consider only weight, water pressure and uplift.
Calculate the maximum vertical stresses at the toe and heel of the dam, assuming 100% uplift pressure at the heel and 50% at the gallery and zero at the toe. [10]

6.a) Discuss briefly, the principles that are involved in the design of stilling basins.
b) Illustrate with neat sketch the following parts of an earthen dam and state their functions briefly:
i) Rock toe, (ii) Horizontal drainage blanket, (iii) Cut-off, (iv) Riprap. [5+5]

OR

7.a) Explain how the following parameters affect design of an earthen dam:
i) Optimum moisture content, (ii) C and ϕ value of soil, (iii) permeability of soil, iv)Sudden drawdown of reservoir.
b) What is meant by an 'energy dissipater'? Discuss the various methods used for energy dissipation below spillways. [5+5]

8.a) Draw the layout of a diversion head work. Explain the various components and their functions.
b) Write short notes on Inverted filter and Launching apron. [5+5]

OR

9.a) Explain the causes and failures of weirs on permeable foundations.
b) Describe the use of Khosla's tables in the computation of pressures at key points. [5+5]

10.a) Explain Mitra's design of hyperbolic transition, when depth of water remains constant.
b) Explain different types of falls with neat sketches. [5+5]

OR

11.a) Discuss in detail different types of cross drainage works with the help of neat sketches.
b) Discuss the design principles of Sarda type fall. [5+5]

--ooOoo--