A   **03000CE302052005**   Pages: 2

Reg No.:_____   Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
Sixth Semester B.Tech Degree (S,FE) Examination May 2023 (2015 Scheme)

Course Code: CE302
Course Name: DESIGN OF HYDRAULIC STRUCTURES

Max. Marks: 100   Duration: 4 Hours

Instructions : (i) Use of Khosla's chart, Blench curves and Montague curves are permitted in the examination hall
(ii) Assume suitable data wherever necessary

PART A
Answer any two full questions, each carries 15 marks.
                                                   Marks

1 a) Enlist the functions of under sluices and divide wall in a diversion headwork   (4)

    b) Explain piping and uplift failures of weirs. State the remedial measures   (5)

    c) Compare Kennedy's theory and Lacey's theory   (6)

2 a) Explain the procedure of design of a vertical drop weir   (6)

    b) Explain the factors affecting selection of type of cross drainage works   (5)

    c) Draw the typical cross section of an unlined canal in cutting and mark the components   (4)

3 a) Describe Khosla's method of independent variables. Explain Khosla's corrections   (9)

    b) What are canal falls? Explain the features of any five types of canal falls   (6)

PART B
Answer any one full question, each carries 50 marks.

4 a) Design a suitable cross drainage work for the following hydraulic particulars: (25)

        Canal
        Full supply discharge = 50 cumecs
        Bed level of the canal=200.0
        Full supply depth= 1.8 m
        Bed width=36 m
        Cross section is trapezoidal with side slope 1.5H:1V
        Drain
        Catchment area = 160 km^2
        Dicken's coefficient =10
        Bed level=198.0
        High flood depth=2.5
    General ground level=200.0. A service road of 6 m is to be provided over the structure

b) Prepare the sketches of the following views :
   (i) Half sectional plan at foundation level (15)
   (ii) Section along the centre line of the canal (10)

5 a) Design a 2 m trapezoidal notch fall for the following data: (25)

Details above drop:
  Full supply discharge= 5.0 cumec
  Bed width= 6 m
  Bed level= 12.00
  Full supply depth=1.5 m
  Level at the top of the bank=14.5
Left bank top width is 3.0 m and right bank top width is 3.5 m
Details below drop:
  Full supply discharge= 5.0 cumec
  Bed width= 6 m
  Full supply level=11.5
  Full supply depth=1.5 m
  Level at the top of the bank=12.5
Left bank top width is 3.0 m and right bank top width is 3.5 m
Good foundation soil is available at 9.5.

b) Prepare the sketches of the following views :
   (i) Half sectional plan at foundation level (15)
   (ii) Section along the centre line of the canal (10)

PART C
Answer any two full questions, each carries 10 marks.

6 a) Explain the modes of failure and stability criteria of gravity dams (8)

 b) Differentiate curtain grouting and consolidation grouting (2)

7 a) Explain elementary profile of gravity dams. Obtain an expression for base width of elementary profile for no tension criteria (5)

 b) Enlist the criteria for safe design of earth dams (5)

8 a) State the limitations of thin cylinder theory for the design of arch dams (5)

 b) Describe Ogee spillway profile and state its discharge equation (5)

****