Reg No.:_____   Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
SIXTH SEMESTER B.TECH DEGREE EXAMINATION, APRIL 2018
Course Code: CE 302
Course Name: DESIGN OF HYDRAULIC STRUCTURES (CE)

Max. Marks: 100   Duration: 4 Hours

Use of Khosla's Chart, Blench Curves and Montague Curves (signed by the concerned faculty member) may be permitted.

Two answer books may be used if required.

PART A

		Answer any two full questions, each carries 15 marks.	Marks
1	a)	What are the general considerations for Canal alignment?	(5)
	b)	What are the assumptions of Khosla's theory for design of impermeable foundation?	(5)
	c)	What is a Cross Drainage work? Explain the types of Cross drainage work.	(5)
2	a)	Draw a neat sketch of layout of a Diversion headwork and explain the functions of components.	(10)
	b)	What are the limitations of Bligh's theory of design of impermeable foundation?	(3)
	c)	What is a Canal regulator?	(2)
3	a)	Design an irrigation channel to carry a discharge of 65 cumecs. Assume Rugosity coefficient = 0.0215. Critical velocity ratio = 1. Channel has a bed slope of 0.15 m/km	(8)
	b)	Using Khosla's theory, determine the pressure at C_1 with interference correction	(5)

(*Use Khosla's curves*)
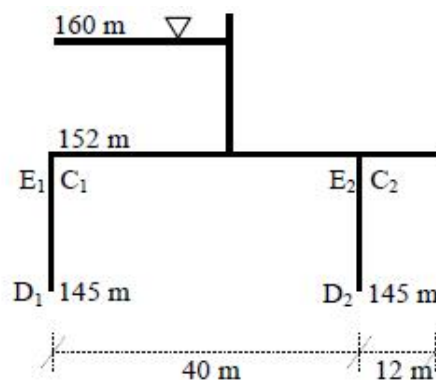
c)   What is the difference between weir and barrage?   (2)

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

4   Design a suitable cross drainage work for the following data at the crossing of a canal and a drainage

CANAL

Full supply discharge   =   45 cumecs

   Full Supply level   =   RL 217.00

   Canal bed level   =   RL 213.00

   Canal bed width   =   20 m

   Canal water depth   =   1.7 m

   Trapezoidal canal section with 1.5 H : 1V slope   (50)

DRAIN

   High flood discharge   =   280 cumecs

   High flood level   =   RL 210

   High flood depth   =   2.5 m

   General ground level   =   RL 214.00

Prepare the following drawings (not to scale)

   i)   Half sectional plan at foundation level

   ii) Section through the centre line of the drain

5   Design a Sarda type fall with a drop of 1.5 m for the following data

Upstream

   Discharge   =   55 m^3/s

   Bed width   =   28 m

   Bed level   =   RL 218.00

   Full supply depth   =   2 m

   Full supply level   =   RL 219.50   (50)

Downstream

   Discharge   =   55 m^3/s

   Bed width   =   28 m

   Bed level   =   RL 216.50

   Full supply depth   =   2 m

Full supply level   =   RL 218.00

Prepare the following drawings (not to scale)

i)   Half plan at top and at foundation level

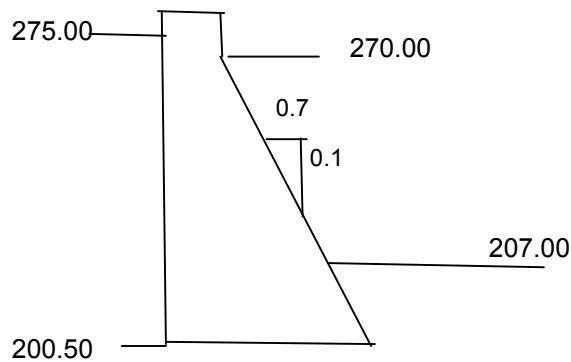ii) Longitudinal Section through the centre line of the canal

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

6   a)   What is a Spillway? Explain Ogee type of spillway.   (6)

    b)   What is meant by Elementary profile of a gravity dam?   (2)

    c)   What are the functions of Water stops in gravity dam?   (2)

7   a)   What is a Stilling basin? Explain Type I and Type II stilling basins   (6)

    b)   Explain thin cylinder method of design of Arch dam   (2)

    c)   What are the functions of gallery in a gravity dam?   (2)

8   Determine the maximum and minimum vertical stresses at heel and toe, major
         principal stress at toe and intensity of shear stress on a horizontal plane near toe
         of the dam.

         Weight of concrete = 23.5 kN/m^3. Top width of dam = 8m, Bottom width = 24
         m

         Allowable stress in concrete = 2500 kN/m^2

(10)

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