

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.

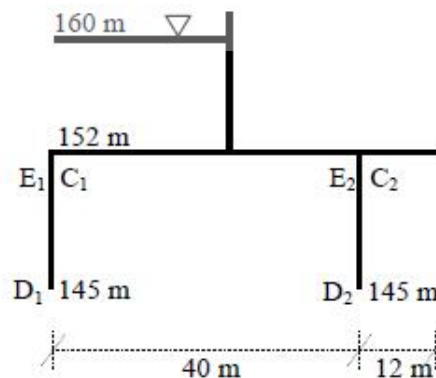
Two answer books may be used if required.

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 C1 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 : 1 V 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)

- Half sectional plan at foundation level
- 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

