

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S6 (R,S) (FT/WP/PT) Examinations April 2026 (2019 Scheme)

Course Code: CET306

Course Name: DESIGN OF HYDRAULIC STRUCTURES

Max. Marks: 100

Duration: 3 Hours

- *Use of Khosla's Chart is permitted in the Examination Hall*
- *Assume suitable design data whichever necessary*

PART A

Answer one full question from each module, each carries 15 marks.

Marks

Module I

- Differentiate between
 - Silt ejectors and silt excluders (3)
 - marginal bunds and guide banks (3)
 - Weir and barrage (4)
 - Obtain an expression for floor thickness based on Bligh's creep theory. (5)

OR

- Describe Khosla's correction for mutual interference of piles. (5)
 - What are the functions of Divide wall. (3)
 - Describe any 3 types of weirs with neat sketch. (7)

Module II

- State under what circumstances you will recommend the use of the following cross drainage structures.
 - Syphon (ii) Inlet (iii) Aqueduct (6)
 - With a neat diagram describe a rapid fall (3)
 - What are the factors to be considered for the selection of site for an irrigation canal (6)

OR

- What are the different types of aqueducts? Describe with neat sketches. (9)
 - Design a regime channel for a discharge of 50 cumecs and silt factor 1.1, using Lacey's theory. (6)

PART B

Answer any one full question

Module III

- 5 a) Design a suitable cross-drainage work, given the following data at the crossing of a canal and a drainage. (25)

Canal

Full supply discharge = 40 cumecs

Full supply level = 223.50

Canal bed level = 222.00

Canal bed width = 20 m

Trapezoidal canal section with 1.5 H : 1 V

Canal water depth = 1.5 m

Drainage

High flood discharge = 450 cumecs

High flood level = 220.00

High flood depth = 2.5 m

General ground level = 222.5m

- b) Prepare the following drawings (not to scale) (25)
- Half sectional plan at top and half at foundation level.
 - Section through the centre line of the drain.

OR

- 6 a) 1. Design a canal drop of 2m with the following data (25)

a. Hydraulic particulars of the canal above drop

Full supply discharge = 4 cubic meters /seconds

Bed width is 6meters

Bed level is +10.00

Full supply depth 1.50 meters

FSL +11.50

Top of bank 2m wide and at level +12.50

Half supply depth 1.00 meter

b. Hydraulic particulars of canal below drop

Full supply discharge = 4 cubic meters /seconds

Bed width is 6meters

Bed level is +8.00

Full supply depth 1.50 meters

FSL +9.50

Top of bank 2m wide and at level +10.50

The ground level at the site of work is +10.50

Good soil is available for foundations at +8.50

c. Trapezoidal notch

Canal discharge = 4 cubic meters / second

FSL upstream of drop = +11.50

FSL downstream of drop = +9.50

Bed level upstream of drop = +10.00

- b) Prepare the following drawings (not to scale) (25)
- i) Half sectional plan at top and half at foundation level.
 - ii) Section along the centre line of the channel.

PART C

Answer one full question from each module, each question carries 10 marks

Module IV

- 7 a) What are the functions and types of galleries in a dam. (6)
- b) Deduce the expression of the limiting height of high and low gravity dam. (4)

OR

- 8 What are the different forces that may act on gravity dam? Discuss with sketches (10)
and write down the expression of the forces.

Module V

- 9 a) Classify the arch dam and explain their features. (6)
- b) What are the limitations of thin cylinder theory. (4)

OR

- 10 a) Write a note on the seepage failure of an earth dam with a neat diagram. (5)
- b) What is meant by spillway? Describe a siphon spillway with a neat diagram. (5)
