

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

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

OR

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

Module II

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

OR

- a) What are the different types of aqueducts? Describe with neat sketches. (9)
b) 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)
