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Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S6 (R,S) / S6 (PT) (R,S) Examination May 2024 (2019 Scheme)

Course Code: CET306

Course Name: DESIGN OF HYDRAULIC STRUCTURES

Max. Marks: 100 Duration: 3 Hours

- **Use of Khosla's Chart, Blench Curves and Montague Curves are 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

1 a) Distinguish between Bligh's theory and Khosla's theory (5)

b) What are the functions of a divide wall and silt excluder in a diversion headwork? (5)

c) Explain the failure of hydraulic structures by sub surface flow. (5)

OR

2 a) Explain limitations of Bligh's theory (5)

b) Explain Exit gradient (5)

c) Explain the Design of vertical drop weir on Bligh's theory (5)

Module II

3 a) Explain the different classifications of canal? (6)

b) Compare Kennedy's theory and Lacey's theory for design of canals through alluvial soils. (9)

OR

4 a) Explain different types of Aqueducts (6)

b) Design an irrigation canal through alluvial soils for the following data : Discharge =20 m^3 /sec; Lacey's silt factor =1 (9)

PART B

Answer any one full question

Module III

5 a) Design a 1.5 m Sarda Type Fall for a canal carrying a discharge of 40 cumecs with the following data: (25)

Bed Level Upstream-105.0m

Bed Level Downstream-103.5m

Full Supply Level Upstream-106.8 m

Bed width-U/s and D/s-30 m

Side Slopes of canal-1:1

Bank level upstream-107.4 m

Safe Exit Gradient for Khosla's theory-1/5

b) Draw the following views of the structure (not to scale):

(i) Half sectional plan at foundation level and at top level (15)

(ii) Longitudinal section (10)

OR

6 a) Design a 1.8 m trapezoidal notch fall for the following data: (25)

Details above drop

Full supply discharge= 5.5 cumec

Bed width= 5 m

Bed level= 19.8

Full supply depth=1.6 m

Level at the top of the bank=22.4

The bank top width is 1.8 m

Details below drop:

Full supply discharge= 5.5 cumec

Bed width= 5 m

Full supply level=19.6

Level at the top of the bank=20.6

The bank top width is 1.8 m

b) Prepare the following drawings (not to scale)

(i) Half sectional plan at foundation level (15)

(ii) Section along the centre line of the canal (10)

PART C

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

Module IV

7 a) What are the forces acting on a gravity dam? (5)

b) Explain the features of different types of spillways (5)

OR

8	a)	Obtain the expressions for principal stress and shear stress at the toe of a gravity dam	(5)
	b)	Differentiate low dams and high dams	(5)

Module V

9	a)	Explain the type of earth dams with neat sketch	(6)
	b)	Explain stilling basin	(4)

OR

10	a)	Derive the most economical central angle of arch dam	(5)
	b)	Explain any five causes of failure of earth dams	(5)

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