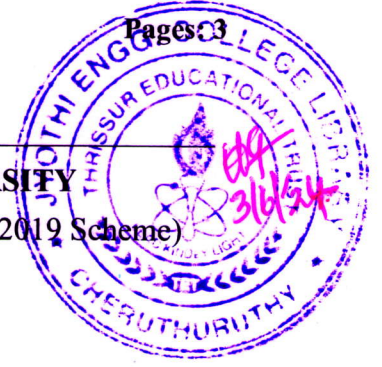


Reg No.: \_\_\_\_\_

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 : (9)  
 Discharge = 20 m<sup>3</sup> /sec; Lacey's silt factor = 1

**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 (25)  
 the following data:  
 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)  
dam
- 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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