Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Sixth Semester B.Tech Degree (S,FE) Examination May 2022 (2015 Scheme)

Course Code: CE302

Course Name: DESIGN OF HYDRAULIC STRUCTURES

Max. Marks: 100 Duration: 4 Hours

Use of Khosla's chart, Blench curves and Montague curve are permitted in the Exam hall

Assume suitable data wherever necessary

PART A

Answer any two full questions, each carries 15 marks.

			Marks
1	a)	What are the assumptions of Bligh's theory?	(3)
	b)	Draw the layout plan of a Diversion headwork and mark its components	(6)
	c)	Explain the criteria for design of impervious floor by Bligh's theory	(6)
2	a)	Explain different types of canals based on alignment	(3)
	b)	An impervious floor of a weir on permeable soil is 16 m long and has sheet piles at both the ends. The upstream pile is 4 m deep and the downstream pile is 5 m deep. The weir creates a net head of 2.5 m. Neglecting the thickness of weir floor, calculate the uplift pressures at the junction of the inner faces of the pile with the weir floor, by using Khosla's theory.	(6)
	c)	What are the draw backs of Kennedy's theory	(6)
3	a)	Explain the functions of berms in unlined canals ?	(3)
	b)	Explain with sketches Type I, Type II and Type III aqueducts	(6)
	c)	What are canal falls? List different types and explain any one.	(6)

PART B

Answer any one full question, each carries 50 marks.

4	a)	Design a suitable cross drainage work for the following hydraulic particulars: **Canal** Full supply discharge = 30 cumecs Bed width = 24.0m Bed level = 200.00 Full supply depth = 1.25m Side slope =1.5 H :1 V Left bank is 3.0 m wide. Right bank is 4.5m wide and the cross drainage work carries a roadway of 4.5m over it.	(25)

Drainage

Maximum flood discharge = 500 cumecs
Bed level = 198.00
High flood level = 200.50m
General ground level = 200.00m
Lacey's silt factor = 1
Rugosity coefficient N = 0.016

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

5 a) Design a 1.5 m Sarda fall for a canal having a discharge of 50 cumecs for the following data: (25)
Full supply level upstream / Downstream= 103.5 m / 102.0 m
Full supply depth upstream and Downstream = 2.0 m
Bed width upstream and Downstream = 35 m
Side slopes of channel = 1:1
Soil is Good loam
Safe exit gradient = 1/5

b) Prepare the following drawings (not to scale)
i) Half sectional plan at top and foundation level
ii) Longitudinal sectional view through centre line of the channel (25)

PART C

Answer any two full questions, each carries 10 marks.

6 a) Explain the criteria for selection of site for a gravity dam. (5)
b) What is meant by elementary profile of a gravity dam? (3)
c) Obtain the expression for base width of theoretical profile of gravity dam based on stress criteria. (2)

7 a) What is a spillway? Explain the features of Ogee type spillway. (5)
b) Distinguish between low dam and high dam (3)
c) What are the assumptions in thin cylinder theory for the design of arch dams? (2)

8 a) Explain the causes of failure of earth dams (6)
b) Draw the sketch of a zoned type embankment dam and mark the parts. (4)

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