R16

Code No: 136BK

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, May - 2019
EARTH AND ROCKFILL DAMS AND SLOPE STABILITY
(Civil Engineering)

Time: 3 hours **Max. Marks: 75**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

1.a)	What is the shear strength as per Coulomb's Law?	[2]
b)	What are 'earthen dams' and under what circumstances are they preferred?	[3]
c)	Distinguish between embankment and foundation.	[2]
d)	Explain the term Phreatic Line in Earth Dams.	[3]
e)	Explain the methods of seepage control in earth dams.	[2]
f)	Explain the Swedish slip circle method of analyzing the stability of an earth dam slopes	[3]
g)	State the measures for surface protection.	[2]
h)	What are the possible modes of failure of a soil-reinforcement system?	[3]
i)	What is the purpose of relief well?	[2]
j)	Explain the purpose and types of cut-offs?	[3]

PART - B

(50 Marks)

2.a)	Explain the types of earth dams with neat sketches.	
b)	Explain the methods of construction with neat sketches.	[5+5]
	OR	
3.a)	What is pore-water pressure and its significance in the design of earth dams?	
b)	What are the causes of failure of earthen dams?	[5+5]
4.a)	Explain Terzaghi criteria for design of transition filters.	
b)	Write briefly on the slope protection measures.	[5+5]
	OR	
5.a)	Illustrate various structural failures in earth dams	
b)	Explain and elaborate the importance of 'seepage' through earthen dams.	[5+5]

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6.a) Derive an expression for calculating the seepage discharge through earthen dam bodies made of isotropic soils . What correction factor is required to be multiplied with this expression, if the dam soil is non-isotropic.

b) Discuss the Stability of downstream slope under steady seepage from the considerations of horizontal shear at base under the downstream slope of the dam. [5+5]

OR

7.a) Briefly explain the Stability of Earthern Slopes.

b) Explain the Stability of Downstream Slope during Steady Seepage. [5+5]

8.a) Explain in detail with steps the 'Simplified Bishops' method for stability analysis of earth dams. Support your answer with necessary equations and calculations.

b) Write step-by-step computational procedure for factor of safety for an embankment by using the Ordinary Method of Slices. [5+5]

OR

9.a) Explain the various methods of slope stability.

b) An embankment is inclined at an angle 35^0 and its height is 15m. The angle of shearing resistance is 15^0 and the cohesion intercept is $40kN/m^2$. The unit weight of soil is $18kN/m^3$. Examine the factor of safety with respect to cohesion. Consider Taylor's stability number= 0.06. [5+5]

10.a) What are 'rock fill dams' and what are their advantages over earthen dams. Draw a neat sketch showing the cross section of a rock fill dam.

b) Explain the design requirements for (i) control of cracking (ii) stability in earthquake regions and at junctions. [5+5]

OR

11.a) What are the basic design requirements for the design of rock fill dam to ensure safety against overtopping, stability and internal erosion.

b) What are the advantages of upstream impervious membrane over earth core? [5+5]

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