

Total No. of Questions : 8]

SEAT No. :

PD4563

[Total No. of Pages : 2

[6404]-67

B.E. (Civil Engineering)
DAMS AND HYDRAULICS STRUCTURES
(2019 Pattern) (Semester - VIII) (401011)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Solve Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right indicate full marks for the sub-questions.
- 4) Assume suitable data if necessary and state them in your answer clearly.
- 5) Use non-programmable pocket size electronic calculator is allowed.

- Q1)** a) Explain any one type of spillway in details. [5]
b) Differentiate between controlled and uncontrolled spillway. [5]
c) Design an ogee spillway for concrete gravity dam, for the following data. [7]
- i) Average river bed level = 160 m
 - ii) Slope of D/S = 0.75 H : 1V, u/s face is vertical
 - iii) Spillway crest RL = 265 m
 - iv) Design discharge = 5750 m³/s
 - v) Spillway length is 6 spans with a clear length of 7 m each.
 - vi) Pier thickness = 2m.

OR

- Q2)** a) Explain the importance of energy dissipater. [5]
b) Draw a neat sketch of the type II stilling basin. [5]
c) Draw typical layout of radial gate showing all the components and explain their purposes. [7]

- Q3)** a) Explain the function of hearting and rock toe in earthen dam. [5]
b) Describe the method of plotting phreatic line for an earth dam with horizontal filter at the downstream. [5]
c) With the help of appropriate sketches explain Swedish slip circle method of stability analysis of an earth dam. [8]

OR

P.T.O.

- Q4)** a) Draw a neat sketch of a cross-section of earthen dam indicating the various components. [5]
b) Briefly explain various causes of modes of failure of earthen dams. [5]
c) Determine the factor of safety of downstream slope of (homogeneous section) an earth dam [8]

drawn to a scale of 1:650, for the following data:

Area of N-rectangle = 20 cm²

Area of T-rectangle = 10 cm²

Area of U-rectangle = 5 cm²

Length of slip circle arc = 20 cm

angle of internal friction = 26°

cohesion $c = 24 \text{ kg/m}^2$

specific weight of soil = 18 kN/m³

- Q5)** a) Explain the advantage and disadvantages of lining of canals. [5]
b) What are the drawbacks of Kenned's theory. [5]
c) Write short note on. [7]
i) canal escapes
ii) canal regulators

OR

- Q6)** a) Write note on Lacey's regime theory. [5]
b) Explain necessity of canal lining. [5]
c) Write short note on. [7]
i) Canal falls
ii) Canal outlets

- Q7)** a) Explain Khosla's theory of independent of seepage variable. [5]
b) Explain the importance of exit gradient. [5]
c) Explain in brief: [8]
i) inlet and outlet
ii) aqueduct

OR

- Q8)** a) Draw a labelled sketch of diversion headworks. [5]
b) Compare bligh's and lane's creep theories of seepage. [5]
c) Explain in brief: [8]
i) Level crossing
ii) Super passage

