

Total No. of Questions: 8]

SEAT No. :

**PB2230**

**[6263]-67**

[Total No. of Pages :2

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

*Time : 2½ Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) Answer Q.1 or Q.2, Q.3 or Q.4, Q5 or Q6, Q7 or Q8.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right indicate full marks.
- 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 spillway with sketch. [5]  
b) Explain main components of spillway. [5]  
c) Explain the concept of energy dissipation below spillway. [7]

OR

- Q2)** a) Explain any one type of spillway gates. [5]  
b) Explain the concept of energy dissipator & its importance. [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 = 0.75H: 1V, u/s face is vertical  
iii) Spillway crest RL = 265m  
iv) Design discharge = 5750 m<sup>3</sup>/s  
v) Spillway length is 6 spans with a clear length of 7 m each.  
vi) Pier thickness = 2m.

- Q3)** a) Enlist different causes of failure of earthen dams and explain any one [5]  
b) Define earthen dam & explain in details limitations of earth dam [5]  
c) Explain various seepage control measures in earthen dam [8]

OR

*P.T.O.*

- Q4)** a) Explain types earth dam based on method of construction [5]  
b) Draw various component of earthen dam [5]  
c) Determine the factor of safety of downstream slope of (homogeneous section) an earth dam drawn to a scale of 1:650, for the following data: [8]

Area of N-rectangle=20cm<sup>2</sup>

Area of T-rectangle=10cm<sup>2</sup>

Area of U-rectangle=5cm<sup>2</sup>

Length of slip circle arc=20cm

angle of internal friction=26°

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

specific weight of soil=18 kN/m<sup>3</sup>

- Q5)** a) What are the advantages of canal lining [5]  
b) Explain the components of canal system with neat sketch [5]  
c) Explain design of canal by Kennedy's theory [7]

OR

- Q6)** a) What is canal? Explain any one types of canals based on function. [5]  
b) What is a Canal Fall? Explain any one types of canal fall. [5]  
c) Enlist & elaborate the steps in designing of trapezoidal lined canal. [7]

- Q7)** a) Explain the concept of weir. [5]  
b) Draw layout plan of diversion head works and label all its components [5]  
c) Explain in brief: [8]  
i) Super passage  
ii) Siphon aqueduct

OR

- Q8)** a) Explain the importance of exit gradient. [5]  
b) Explain lane's creep theories of seepage [5]  
c) Explain in brief: [8]  
i) Level crossing  
ii) Super passage

