

Total No. of Questions : 12]

SEAT No. :

P3078

[5461]-114

[Total No. of Pages : 3

B.E. (Civil)

DAMS AND HYDRAULIC STRUCTURES

(2012 Pattern) (Semester-II) (End Sem.)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Answer Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8, Q9 or Q10, Q11 or Q12.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicate full marks.*
- 4) *Use of electronic non-programmable calculator is allowed.*
- 5) *Assume suitable data if necessary.*

UNIT-I

Q1) How the dam instrumentation is helpful for health monitoring of dams? [6]

OR

Q2) To achieve overall economy of the water resource project, during planning, what measures are required to be adopted? [6]

UNIT-II

Q3) Define 'Elementary Profile' of a gravity dam and drive the equations for determination of base width on the basis of 'No Tension' and 'No Sliding' conditions. [2+6]

OR

Q4) a) Enlist different galleries used in gravity dams. Briefly explain function of any two of them. [2+4]

b) How the joints in gravity dam are sealed? [2]

P.T.O.

UNIT-III

- Q5) a)** Give four causes of overtopping of dams. [4]
b) Enlist various components of pumped storage power plant. [2]

OR

- Q6) a)** Write a note on importance of energy dissipators. [4]
b) What is peak load plant? Give suitable example. [1+1]

UNIT-IV

- Q7) a)** Briefly explain: [2]
i) Pitching
ii) Rock toe
b) Determine the coordinates of base parabola for zoned earth dam section with following details. [8]
i) Slope of upstream face (casing) = 3 : 1
ii) Slope of downstream face (casing) = 2.5 : 1
iii) Top width = 6 m
iv) Slope of upstream face (hearting) = 1 : 1
v) Slope of downstream face (hearting) = 1 : 1
vi) Height of dam = 33 m
vii) Free board = 3 m
(Note : For calculation, consider interval of 'x' coordinates as 10 m).
c) State the corrections suggested by Khosla. Explain in detail the correction for mutual interference of piles. [3+5]

OR

- Q8) a)** While applying the correction for slope of floor, how the nature of correction (viz. additive or subtractive) is decided. [2]
b) A weir of height 3 m is constructed on permeable foundation on horizontal floor of thickness 2 m. Pile number-1 of 7 m depth (measured from floor bottom) is provided on upstream of weir. Pile number-2 of 8 m depth (measured from floor bottom) is provided on downstream of weir. The length of floor is 65 m. Determine the correction for floor thickness in magnitude and nature at key point C1 and also the corrected value of residual seepage head. The weir retains water upto full height. [8]
(Given : $\Phi_{C1} = 67\%$ & $\Phi_{D1} = 77\%$).
c) Write a short note on: [4+4]
i) Rolled fill method
ii) Sudden drawdown condition

UNIT-V

- Q9) a)** Design an unlined alluvial trapezoidal canal section to carry a discharge of $12 \text{ m}^3/\text{s}$. The longitudinal slope is 1 in 3000 and the side slope is 0.5 H : 1 V. Use Lacey's theory and take silt factor $f = 0.9$. [8]
- b) What is canal fall? Under what circumstances canal falls are provided? State the factors affecting number of canal falls in a specific reach. [2+3+3]

OR

- Q10)a)** Write short note on: [8]
- i) Regime Channel
 - ii) Economics of canal lining
- b) Briefly explain Kennedy's theory. What are the drawbacks of Kennedy's theory? [4+4]

UNIT-VI

- Q11)a)** Write short notes on: [8]
- i) Attracting groyne
 - ii) Deflecting groyne
- b) What do you understand by cross drainage work? Explain in detail level crossing. [8]

OR

- Q12)a)** Write short note on: [8]
- i) Super passage
 - ii) Canal syphon
- b) What do you understand by river training work? What are the functions of fish ladder and silt excluder? [8]

