

Total No. of Questions : 12]

SEAT No. :

P5572

[Total No. of Pages : 3

[5561] - 514

B.E. (Civil) (Semester - II)

DAMS AND HYDRAULIC STRUCTURES

(2015 Pattern)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8, Q.9 or Q.10, Q.11 or Q.12.
- 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.

Q1) Discuss the impact of climate change on a water resource project. [6]

OR

Q2) Differentiate between Large Dam and Small Dam. What will be your choice and why? [6]

Q3) a) Discuss various methods to reduce uplift pressure at the base of gravity dam. [6]

b) What are the factors affecting selection of arch dam? [2]

OR

Q4) a) What is elementary profile of a gravity dam? How it is modified to get practical profile? [6]

b) Enlist any four Load Combinations considered for design of gravity dam. [2]

P.T.O.

**Q5)** Draw a labeled sketch of ogee spillway showing all components. [6]

OR

**Q6)** Enlist types of spillway gates and explain anyone. [6]

**Q7) a)** State different corrections suggested by Khosla. Explain in detail the correction for mutual interference of piles. [6]

b) Determine the factor of safety of downstream slope of homogenous earth dam section drawn to a scale of 1 : 500 [8]

i) Length of slip circle arc = 15 cm

ii) Total area of N-Rectangles = 16.5 cm<sup>2</sup>

iii) Total area of T Rectangles = 7 cm<sup>2</sup>

iv) Total area of U - Rectangles = 5 cm<sup>2</sup>

v) Angle of Internal friction = 26°

vi) Cohesion = 0.2 kg/cm<sup>2</sup>

vii) Specific weight of soil = 1.8 kg/cm<sup>3</sup>

c) Explain seepage failure of earthen dam. [4]

OR

**Q8) a)** Briefly explain different causes of failure of earthen dams. [8]

b) Differentiate between weir and barrage. [4]

c) With the help of expression explain '*Exit Gradient*'. Also give permissible values of it for various soils. [6]

**Q9) a)** What is a canal? Explain three types of canals based on function. [8]

b) Design an unlined alluvial canal section to carry a discharge of 10 m<sup>3</sup>/s. The longitudinal slope is 1 in 4000 and the side slope is 0.5 H : 1 V. Use Lacey's theory and take silt factor  $f = 0.9$ . [8]

OR

**Q10) a)** Design an irrigation channel section to carry a discharge of  $5 \text{ m}^3/\text{s}$ . Assume  $N = 0.0225$  and  $m = 1$ , Consider trial depth  $D = 1.0 \text{ m}$  and channel bed slope as  $0.0002$ . **[8]**

**b)** What is a Canal Fall? Discuss the necessity of it. **[4]**

**c)** Write a short note on : **[4]**

i) Canal Escape.

ii) Ogee Fall.

**Q11) a)** Explain necessity of cross drainage work. Explain Syphon Aqueduct in detail with neat sketch. **[4 + 4]**

**b)** What do you understand by river training work? What are the functions of marginal bunds? **[8]**

OR

**Q12) a)** Write a short note on : **[8]**

i) Super passage.

ii) Level crossing.

**b)** Explain in brief : **[8]**

i) Attracting groyne.

ii) Deflecting groyne.

