

B.E. Civil Engineering (Model Curriculum) Semester-VIII
OECE-2-CE804 - Advanced Hydraulic Structures

P. Pages : 2

Time : Three Hours



GUG/S/25/14337

Max. Marks : 80

- Notes :
1. All questions carry equal marks.
 2. Due credit will be given to neatness and adequate dimensions.
 3. Assume suitable data wherever necessary.
 4. Illustrate your answers wherever necessary with the help of neat sketches.

1. a) What are the main causes of failures of weirs on permeable foundations and remedies would you suggest to prevent them. 8
- b) State the fundamental difference between Khosla's theory and Bligh's creep theory for seepage below a weir. 8

OR

2. a) Explain factors governing the design of a weir or a barrage. 8
- b) What is Retrogression. 8
3. a) Explain with neat sketches. 8
- i) Side channel spillway.
- ii) Well type fall.
- b) Explain energy dissipation below spillway. 8

OR

4. Design a suitable section for the overflow portion of a concrete gravity dam having upstream face sloping 1:3 and down stream face sloping of a slope of 0.7 H : 1 V. The design discharge for the spillway is 8000 cumecs. The height of the spillway crest is kept of RL 204.0m. The average river bed level at the site is 100 m. The spillway length consist of 6 spans having a clear width of 10 m each. The thickness of each pier may be taken to be 2.6 m. 16
5. a) What is rigid modules? Explain Gibb's module. 8
- b) Describe briefly canal Escapes with neat sketches. 8

OR

6. a) What is meant by canal regulation and what are the different canal regulation work? Explain function of head regulator. 8
- b) What is meant by the term flexibility proportionally, setting and sensitivity as applied to modules. Derive equations for them and discuss relation between these terms. 8

7. Design a suitable cross – drainage work, given the following data at the crossing of a canal and a drainage. **16**

Canal :

Full supply discharge = 32 cumec

Full Supply level = RL . 213.5

Canal bed level = RL . 212.0 m

Canal bed width = 20

Trapezoidal canal section with $1\frac{1}{2}$ H : 1V slopes

Canal water depth = 1.5 m

Drainage :

High flood discharge = 300 cumecs

High flood level = 210.0 m

High flood depth = 2.5 m

General ground level = 212.5 m

OR

8. a) What is river training? Explain any two methods of it. **8**
- b) Explain Mitra's Hyperbolic transition. **8**
9. a) Write short notes on : **8**
- i) Wet intake tower.
- ii) Trash Rocks.
- b) What is meant by Dam Sluice? Why are such sluices necessary in dam construction. **8**

OR

10. a) Show with neat sketches, the provision of sluice way in **8**
- i) An earthen dam
- ii) A concrete gravity dam.
- b) Explain with neat sketch simple submerged intake. **8**
