

**FACULTY OF ENGINEERING**  
**B.E. 4/4 (Civil) I Semester (Main) Examination, December 2011**  
**WATER RESOURCES ENGINEERING MANAGEMENT – II**

Time : 3 Hours]

[Max. Marks : 75

**Note : Answer all questions from Part A. Answer any five questions from Part B.**

**PART – A****(25 Marks)**

1. Define dead storage and live storage 2
2. Write classification of dams based on function. 2
3. Write the various structural failures of earth dams. 2
4. Define hydraulic jump and write various types of jumps in a rectangular channel. 2
5. Write classification of hydroelectric plants based on plant capacity. 2
6. Define flood routing and write the various methods of flood routing computation. 3
7. The compressive stress of concrete dam is  $2800 \text{ kN/m}^2$  and specific gravity of material used is 2.3 compute maximum limiting height of dam. 3
8. Write the advantages of under ground power houses. 3
9. Draw a neat sketch of ski jump bucket energy dissipator. 3
10. Write three characteristics of phreatic line. 3

**PART – B****(50 Marks)**

11. a) Briefly explain various investigations for reservoir planning. 6
- b) Determine the minimum storage capacity of a reservoir with the following data. 4

| Month         | Jan. | Feb. | Mar. | April | May | June | July | Aug. | Sep. | Oct. | Nov. | Dec. |
|---------------|------|------|------|-------|-----|------|------|------|------|------|------|------|
| In flow units | 200  | 100  | 300  | 600   | 800 | 900  | 500  | 700  | 800  | 400  | 300  | 300  |
| Dem and units | 500  | 400  | 300  | 300   | 200 | 500  | 300  | 300  | 400  | 500  | 700  | 800  |

12. a) Define economical height of a gravity dam. 2
- b) A gravity dam 30 m high is trapezoidal section with top width of 3 m and bottom width of 20 m. The face exposed to water has a batter of 1 in 20. Test the stability of dam for reservoir full condition by consideration selfweight, water pressure and uplift only, take  $G = 2.24$ , specific weight of water as  $1000 \text{ kg (f)/m}^3$ . Take permissible shear stress at joint as  $14 \text{ kg (f)/cm}^2$ . Assume no free board. 8
13. a) Briefly explain various classification earthen dams. 5
- b) Explain the graphical procedure to construct phreatic line in earthen dam with horizontal filter. 5
14. a) Explain how do you construct a jump Right curve and jail water curve. Also state how do you select the energy dissipation work based on above curves. 5
- b) Compute the discharge over on ogee weir with  $c = 2.4$  at a head of 2 m. The length of spill way is 100 m and the weir crest is 8 m above the bottom of approach channel having the same length as that of spillway. 5
15. a) Define : 5
- |              |              |                 |
|--------------|--------------|-----------------|
| i) Storage   | ii) Pondage  | iii) Gross head |
| iv) Net head | v) Rate head |                 |
- b) Two turbo generators each of capacity 20000 kW have been installed at a hydel power station. During a period the load on plant varies from 15000 to 35000 kW. Calculate : 5
- |                |                  |                         |
|----------------|------------------|-------------------------|
| i) Load factor | ii) Plant factor | iii) Utilisation factor |
|----------------|------------------|-------------------------|
16. a) Briefly explain the various factors governing the selection of type of dam. 5
- b) Explain with neat sketches the various types of filters used in earth dams. 5
17. Write short notes on **any two** of the following : (2×5=10 Marks)
- a) Mass curve and demand curve and their uses.
- b) Types of spillways under various considerations.
- c) Flow duration curve and its application.