

(Revised)

[Time: Three Hours]

[Max. Marks: 80]

“Please check whether you have got the right question paper.”

N.B

- i) Q No.1 and Q No.6 are compulsory.
- ii) Answer any two questions from remaining questions of each section.
- iii) Assume suitable data, if necessary.
- iv) Figures to the right indicate full marks.

SECTION -A

- Q.1 A) What do you understand by mass inflow curve and how is it prepared? 05
B) Flow would you determine the yield of a reservoir? 05
- Q.2 A) Discuss in brief various modes of failure of a gravity dams. 07
B) What do you understand by the elementary profile of a gravity dam? Derive expression for determining base width of such a dam based on i) Stress criteria ii) Sliding criteria. 08
- Q.3 A) What is phreatic line? What is its use? How would you locate the phreatic line in an earthen dam with a horizontal drainage filter? 07
B) Discuss in brief the causes of failure of earthen dam. 08
- Q.4 A) Show that the most economical central angle of an arch based on the thin cylinder theory is $133^{\circ} 34'$. 08
B) Discuss various types of arch dam. 07
- Q.5 A) Discuss step by step the analytical procedure that you will adopt for analyzing the stability (two dimensional analysis) of gravity dams. 07
B) Explain the Swedish slip circle method of analyzing the stability of an earth dam slopes. 08

SECTION -B

- Q.6 A) “A spillway is a safety valve in a dam”. Discuss the statement. 05
B) Compare briefly the silt theories of Kennedy and lacey. 05
- Q.7 A) Enumerate the important types of spillway gates. Describe with a neat sketch the construction and working of ‘Radial gate’ 08
B) What is meant by an ‘energy dissipater’? Discuss the various methods used for energy dissipation below spillways. 07
- Q.8 A) Design an irrigation channel to carry 50 cusecs of discharge. The channel is to be laid at a slope of 1 in 4000. The critical velocity ratio (m) for the soil is 1.1. Use kutter’s eugosity coefficient (n) as 0.023. 08
B) Briefly explain Khosla’s theory and how is it used in design of weir on permeable foundation. 07
- Q.9 A) Draw a neat sketch illustrating each of the following types of canal outlets. 08
i) Non-modular ii) Semi-modular iii) Rigid-module.
B) Enumerate the important features of hydraulic design of a syphon aqueduct. Discuss any one method of transition design with constant water depth. 07
- Q.10 A) Explain the functions of the distributary head regulator and cross regulator. 08
B) Explain the procedure for the design of a vertical drop weir. 07