

Code No: R32014

R10

Set No: 1

III B.Tech. II Semester Regular Examinations, April/May -2013

WATER RESOURCES ENGINEERING-II

(Civil Engineering)

Time: 3 Hours

Max Marks: 75

Answer any FIVE Questions
All Questions carry equal marks

1. Sketch the layout of a typical diversion headwork and describe briefly the functions of the various components of diversion headwork.
2. (a) Differentiate clearly between the following.
 - (i) A flood control reservoir and a multipurpose reservoir.
 - (ii) Firm yield, safe yield and secondary yield of a reservoir.(b) Discuss the physical factors that govern the selection of type of dam.
3. (a) Design the practical profile of a gravity dam for the following data:

R.L of base of dam	= 198 m
R.L of HFL of reservoir	= 228 m
Specific gravity of masonry	= 2.4
Safe compressive stress in masonry	= 1200 kN/m ²

(b) Explain briefly the different forces that may act on a gravity dam?
4. (a) Briefly discuss the stability analysis of an earthen dam.
(b) What do you understand by piping? What measures can be taken to ensure safety of an earth dam against the failure due to piping?
5. (a) How would you compute the discharge passing over an ogee spillway?
(b) What are spill ways and what is their necessity?
6. (a) What is meant by falls? Where are they located?
(b) Discuss briefly the components of various types of falls with neat sketches.
7. What are the necessity and functions of head regulators and cross regulators?
8. Briefly explain design principles of aqueduct.



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Set No: 2

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WATER RESOURCES ENGINEERING-II

(Civil Engineering)

Time: 3 Hours

Max Marks: 75

Answer any FIVE Questions
All Questions carry equal marks

1. Write short notes on: (i) Silt ejector (ii) Fish ladder (iii) Scouring sluices (iv) Divide wall (v) Dividing groyne.
2. (a) What do you mean by the life of a reservoir? What measures to be taken to prolong the life of a reservoir.
(b) Classify various types of dams. Distinguish clearly between rigid and non-rigid dams.
3. (a) Differentiate between:
 - (i) Low gravity dam and high gravity dam.
 - (ii) Construction joints and contraction joints.
 - (iii) Elementary profile and practical profile.(b) What are the modes of failure and criteria for stability requirements for a gravity dam?
4. Discuss in brief the causes of failure of earth dams and their remedies.
5. Discuss the merits and demerits of different types of spillway gates.
6. Briefly explain the design principles of Sarada type fall.
7. (a) What are outlets? Enumerate the different types of outlets which are in common use on canal projects.
(b) Define the terms: (i) flexibility (ii) proportionality (iii) sensitivity
8. (a) What is meant by cross drainage works and what is their importance in a canal project?
(b) Describe with the help of sketches various types of cross-drainage works.



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Set No: 3

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WATER RESOURCES ENGINEERING-II

(Civil Engineering)

Time: 3 Hours

Max Marks: 75

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Explain Khosla's method of independent variables.
(b) Describe briefly with neat sketches the various types of weirs.
2. (a) Discuss the geological and topological features which effect the selection of the type of dam.
(b) What do you understand by demand curve? Explain the method of calculating reservoir capacity for a specified yield, from the mass inflow curve.
3. A masonry dam 10m high is trapezoidal in section with a top width of 1m and bottom width of 8.25 m. The face exposed to water has a batter of 1:10. Test the stability of the dam. Find out the principal stresses at the toe and heel of the dam. Assume unit weight of water = 1000 kg/m^3 and permissible shear of joint = 14 kg/cm^2 .
4. Describe with neat sketch how top seepage lining is drawn in a homogeneous dam without any arrangement for drainage.
5. Describe with the help of sketches, the working of an ogee-shaped spillway.
6. Discuss the comparative merits and demerits of notch falls and Sarada type falls.
7. Describe the procedure for designing a head regulatory for a distributor.
8. Write short notes on: (i) Aqueduct (ii) Syphon aqueduct (iii) Level crossing (iv) Super passage (v) Canal siphon



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Set No: 4

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WATER RESOURCES ENGINEERING-II

(Civil Engineering)

Time: 3 Hours

Max Marks: 75

Answer any FIVE Questions
All Questions carry equal marks

- (a) Discuss briefly the causes of failure of weirs on permeable foundation and their remedies.
(b) Discuss Bligh's creep theory of design of weirs on permeable foundation.
- Find the probable life of a reservoir with an initial capacity of 3700 ha-m if the average annual inflow is 7400 ha-m and average annual sediment inflow is 2×10^6 kN. Assume a specific weight of sediment as 11.2 kN/m^3 . The useful life of the reservoir will terminate when 80 % of its initial capacity is filled with sediment. The values of trap efficiency for different values of capacity inflow ratio are given as follows:

Capacity inflow ratio	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
Trap Efficiency %	87	93	95	95.5	96	96.5	97	97.3	97.4	97.5

- (a) Derive an expression for the limiting height of a low gravity dam. Differentiate between low and high gravity dam.
(b) Explain with sketch how you find the uplift pressure on a gravity dam provided with drainage gallery.
- (a) Enumerate the different types of earth dams and draw neat sketches showing each type.
(b) Define and explain the term phreatic line in earth dam.
- Enumerate the different types of spillways which are used in dam construction.
- (a) What are canal falls and why are they constructed?
(b) Write short notes on: (i) Trapezoidal notch fall (ii) straight glacis fall
- Describe the procedure for designing a cross regulatory for a distributor.
- What are the different types of cross drainage works that are necessary on a canal alignment? State briefly under which each one is used.

