

Code No: R32014

R10

Set No: 1

III B.Tech. II Semester Supplementary Examinations, January-2014

WATER RESOURCES ENGINEERING-II

(Civil Engineering)

Time: 3 Hours

Max Marks: 75

Answer any FIVE Questions
All Questions carry equal marks

1. Draw a neat layout of a river regulator, and indicate suitable locations and explain briefly for the following: (i) A navigational lock (ii) A fish ladder (iii) Scouring sluices (iv) Head sluices.
2. (a) Discuss the various factors which govern the selection of a particular type of dam.
(b) Explain the mass curve method for determining reservoir capacity for fulfilling a given demand.
3. (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.
4. (a) What is meant by pore water pressure and what is its significance in the design of earth dams?
(b) Differentiate between horizontal and vertical piping in earth dams? Suggest permanent measures to check vertical piping.
5. Write short notes on (i) Side channel spillway (ii) Ogee spillway (iii) spillway gates.
6. (a) Discuss the comparative merits and demerits of notch falls and sarada type falls.
(b) Mention the design principles of trapezoidal notch fall.
7. (a) Describe the procedure for designing a cross regulatory for a distributor.
(b) Define sensitivity of an outlet. Find the relation between sensitivity and flexibility of an outlet.
8. Describe with the help of sketches various types of cross drainage works.

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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. Differentiate between the following: (i) A barrage and a dam (ii) Silt excluders and silt ejectors (iii) Surplus weir and storage weir (iv) Scouring sluices and head sluices.
2. (a) Classify various types of dams. Distinguish clearly between rigid and non-rigid dams.
(b) Discuss with a neat sketch the various storage zones of the dam reservoir.
3. Write short notes on (i) Earthquake forces on dams (ii) drainage gallery (iii) Construction joints in dams (iv) Elementary profile of a gravity dam.
4. (a) What precautions and remedial measures would you undertake to control the seepage through (i) earthen dam body (ii) through the dam foundation.
(b) Draw a section of an earth dam of 20 m height indicating the various parts of the dam.
5. Enumerate the different types of spillways which are used in dam construction.
6. (a) Discuss the procedure for designing a sarada type fall.
(b) Mention the design principles of trapezoidal notch fall.
7. What do you understand by a head regulator? State functions of a distributary head regulator and a cross regulator.
8. (a) Differentiate between (i) syphon aqueduct and canal syphon (ii) aqueduct and super passage.
(b) What do you understand by level crossing?

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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) Differentiate between a silt extractor and a silt excluder. Draw a neat sketch and discuss the principles involved in designing the different components of a silt extractor.
(b) What are the different types of weirs? Explain with neat sketches circumstances under which each type is adopted?
2. (a) Discuss the geological and topological features which effect the selection of the type of dam.
(b) Write short notes on (i) reservoir sedimentation and its control (ii) Estimating the life of a reservoir.
3. The following data refers to the non-overflow section of a gravity dam: R.L of top of the dam = 315 m, R.L of bottom of the dam = 260 m, Full reservoir level = 312 m, Top width of dam = 12m, Upstream face is vertical. Downstream face is vertical upto RL 304 m, and thereafter the downstream face slopes at 0.7(H) : 1 (V) up to base. Drainage holes are located at 8 m away from the upstream face. Unit weight of masonry = 23 kN/m³, reduction of uplift at drainage hole = 50%. Coefficient of friction between masonry and foundation material = 0.8. Determine (i) factor of safety against overturning (ii) factor of safety against sliding.
4. (a) Explain briefly how the stability of earthen slopes are checked by the slip circle method.
(b) Explain with neat sketches how you would carry out the stability analysis of an earth dam.
5. Discuss briefly the design principles that are involved in the design of ogee spillway. Discuss the various factors affecting the coefficient of discharge in the discharge equation.
6. (a) What is cistern element in fall? Give various expressions for its dimensions.
(b) Explain the procedure of designing straight glacis fall.
7. (a) Distinguish clearly between non modular and semi modular outlets. Give example.
(b) What are the functions of head regulator in a canal.
8. Give the Classification of aqueducts and explain under what circumstances each one is used.

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R10**Set No: 4**

III B.Tech. II Semester Supplementary Examinations, January-2014

WATER RESOURCES ENGINEERING-II

(Civil Engineering)

Time: 3 Hours**Max Marks: 75**Answer any FIVE Questions
All Questions carry equal marks

- (a) How does Khosla's theory differ from Bligh's theory with regard to the design of weirs on permeable foundations?
(b) What is meant by piping in a hydraulic structure? What are ill effects of piping? What are the precautionary methods to avoid the ill effect of piping?
- A proposed reservoir has a capacity of 500 ha-m. The catchment area is 125 km², and the annual stream flow averages 12 cm of runoff. If the annual sediment production is 0.03 ha.m/ km², what is the probable life of the reservoir before its capacity is reduced by 10% of its initial capacity by sedimentation? The relationship between trap efficiency η (%) and capacity inflow ratio C/I is as under:

C/I	0.01	0.02	0.04	0.06	0.08	0.1	0.2	0.3	0.5	0.7
η %	43	60	74	80	84	87	93	95	96	97

- Write short notes on (i) Forces acting on gravity dam (ii) Stability analysis of gravity dam (iii) Construction joints and contraction joints in a gravity dam.
- Explain by neat sketches the different ways by which the earthen dams may fail. Also suggest suitable precautions that should be undertaken to avoid each type of failure.
- What are the various methods adopted in energy dissipation below a spillway, describe them in detail.
- (a) What do you understand by a fall in a canal? Why it is necessary? How do you select its location?
(b) Write short notes on Notch type fall.
- (a) Mention the design principles of siphon aqueduct.
(b) What do you understand by level crossing?
- (a) What is an outlet? Write down the requirements that an outlet should fulfill.
(b) Describe the procedure for designing a cross regulatory for a distributor.
