

Water Resource Engineering (315314)

MSBTE Diploma · K-Scheme · Model Question Paper — Set B

Time: 3 Hours
Max. Marks: 70
Instructions:

1. All questions are compulsory.
2. Answer each next main question on a new page.
3. Illustrate your answers with neat sketches wherever necessary.
4. Figures to the right indicate full marks.
5. Assume suitable data, if necessary.
6. Mobile phone, pager and any other electronic communication devices are not permissible in the examination hall.

Q.1 Attempt any FIVE of the following:
10

- a) Name any four types of irrigation projects classified according to purpose.
- b) Define: i) Precipitation ii) Evaporation.
- c) Define: i) Crop period ii) Base period.
- d) Enlist the forces acting on a gravity dam.
- e) Define spillway. State any two advantages of providing a spillway.
- f) Define sprinkler irrigation.
- g) Define: i) Super passage ii) Canal siphon.

Q.2 Attempt any THREE of the following:
12

- a) Draw a neat sketch of Symon's rain gauge. Differentiate between non-recording and recording type rain gauges.
- b) The areas between successive isohyets of a storm over a catchment are given below. Find the average depth of rainfall over the catchment.

Isohyets (mm)	140–160	120–140	100–120	80–100	60–80
Area between isohyets (km ²)	45	120	210	260	150

- c) Define runoff. State the factors affecting runoff.
- d) Define silting of reservoir. State the factors affecting silting and any two control measures.

Q.3 Attempt any THREE of the following:
12

- a) A crop requires a total depth of water of 60 cm during its base period of 120 days. Find the duty of water. If the culturable command area is 5000 ha and the intensity of irrigation is 70 %, find the discharge required at the field.
- b) Compare gravity dam and earthen dam with respect to: foundation, material, seepage, spillway.
- c) Explain the types of earthen dams with neat sketches.

- d) Explain the necessity of energy dissipation below a spillway. Describe any one energy dissipator with a sketch.

Q.4 Attempt any THREE of the following:

12

- State any four requirements of an ideal site for a bandhara.
- Draw the layout of a drip irrigation system and state the functions of its components.
- State the advantages and disadvantages of well irrigation.
- Compare weir and barrage with respect to: cost, afflux, silt control and maintenance.
- Draw a neat layout of diversion headworks showing all component parts.

Q.5 Attempt any TWO of the following:

12

- Fix the control levels of a medium size reservoir from the following data: effective storage required for crops = 14.5 Mm³; tank losses = 20 % of effective storage; carry-over allowance = 10 % of effective storage; dead storage = 12 % of gross storage; flood lift = 2.5 m; free board = 2.5 m.

Contour R.L. (m)	450	453	456	459	462	465	468
Capacity (Mm ³)	0.6	1.9	4.1	7.3	11.6	17.2	24

- Derive the relation between duty, delta and base period. Find the delta of a crop whose duty at the field is 1400 ha/cumec and base period is 110 days.
- Suggest suitable routine maintenance measures for an earthen dam.

Q.6 Attempt any TWO of the following:

12

- Enlist the types of gates used on spillways. Explain radial gate and vertical lift gate with neat sketches.
- State any three advantages and three disadvantages of canal lining.
- Explain with neat sketches: i) Head regulator ii) Escape iii) Canal fall.

Note: This is a **model question paper prepared by Ananda Technologies** only for practice and exam preparation, based on the pattern of previous MSBTE question papers and the K-scheme syllabus. It is **not an official MSBTE paper**, and it does **not** mean that these questions will come in the exam. Answers follow standard textbook points; marks shown are indicative. Free for students — anandatechnologies.in