

1078

**B.E. (Civil Engineering) Seventh Semester
CIV-702: Irrigation Engineering – II**

Max. Marks: 50

Time allowed: 3 Hours

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Section. Assume missing data suitable if any. Notations used carry usual meaning.

x-x-x

1. Describe/Answer the following in brief.

- What is 'piping' in the foundation of a weir?
- What do you understand by exit gradient?
- Differentiate between a weir and a barrage.
- Write the main functions of a spillway.
- What are 'modules'?
- Define syphon and super-passage.
- What are the cross-drainage works?
- Define stream lines and equipotential lines. Draw a simple sketch showing the se lines.
- What is off-take alignment?

[10 × 1 = 10 marks]

SECTION-A (10 × 2 = 20 marks)

- Describe the Bligh's creep theory of seepage flow. [5]
 - Why is it necessary to control silt entry in the canal? What methods are adopted for this purpose? [5]
- How does hydraulic jump help in energy dissipation? Describe (i) various types of energy dissipaters and (ii) factors affecting their design. [10]
- A river discharges 1000 m³/s of water at high flood level (HFL) of RL 103.00 m. A weir is constructed for flow diversion with a crest length of 255 m and total length of concrete floor as 40 m. The weir has to sustain the under seepage at a maximum static head of 2.4 m. Determine the depth of downstream (d/s) cut off. Take silt factor = 1.1, Safe exit gradient = 1/6, RL of d/s floor = 100.00 m. [10]

SECTION-B (10 × 2 = 20 marks)

5. Design a pipe outlet for the following data:

Full supply discharge at the head of water course = 100 litres/sec.
F.S.L. in distributory = 206.00 m
F.S.L. in water course = 205.00 m

[10]

6. Describe the necessity and functioning of Distributory head regulator and Cross regulator in a canal project. Also discuss the procedure adopted in designing of these regulators. [10]

7. Design a syphon aqueduct for the following data: [10]

Canal	Drainage
Full supply discharge = 40 cumecs	Maximum flood discharge = 150 cumecs
Bed level = 206.4 m	HFL = 207 m
Full supply depth = 1.6 m	Average bed level = 204.5 m
Bed width = 30 m	Average ground level = 206.5 m
Side slope = 1.5 H : 1 V	