

Question bank Irrigation Engineering-II

Two marks Questions

Q-1) Write down the formulae used for the design of the following:

- (a) Correction for Mutual interference.
- (b) For creep length as stated by Bligh's & Lanes.
- (c) Lacey's scour depth.
- (d) Thickness of impervious floor.

Q-2) Define the following:

- (e) Exit Gradient
- (f) Critical exit gradient
- (g) Piping
- (h) Hydraulic Jump

Q-3) Write down the formulae used for the design of the following:

- (i) For a standard form consisting of a floor length 'b' with a vertical cutoff of depth 'd' the Exit Gradient at downstream end is given by
- (j) For calculation of total creep length as stated by Bligh's & Lanes.
- (k) For calculations of top width of weir wall based upon No tension Criteria.

Q-4) Write down the formulae used for the design of the following:

- (l) Correction for Mutual interference.
 - (m) For creep length as stated by Lanes.
 - (n) Thickness of downstream impervious floor.
5. Define canal regulation works?
 6. Differentiate between metered and Non metered fall by giving one example of each.
 7. Define canal escapes
 8. Give discharge formula & shape for a crest of a fall if discharge is less than 14 cumecs.

9. What do you mean by canal regulation?
10. Define canal fall?
11. Differentiate between canal head regulator & canal cross regulator.
12. Give discharge formula & shape for a crest of a fall if discharge is less than 14 cumecs.
13. Differentiate between Metered and Non Metered fall by giving one example of each.
14. Explain in brief about canal fall.
15. What do you mean by canal regulation works?
16. Differentiate between Weir & Barrage.
17. Give various functions of a cross regulator?
18. What are the different types of weir? Explain with neat sketches.
19. Define 'Super Passage' and 'Aqueduct'.
20. Define Cross drainage works.
21. Differentiate between 'Non Modular Outlets' & 'Flexible Modules'.
22. Inlets & Outlets are provided when drainage discharge is (more or less).
23. Define 'Level Crossing' and 'Syphon-Aqueduct'.
24. State any two essential requirements of good Modules.
25. Give the formula for calculating discharge in a submerged pipe outlet.
26. Level crossing is provided when drainage discharge is?

Five mark Questions

1. Explain in brief various functions of divide wall?
2. Differentiate between Bligh's theory and Lane Weighted creep theory?
3. Explain in brief about canal Head Regulator & also its functions?
4. Define the following Terms:

Stream Lines (ii) Equipotential Lines

5. What are the different types of weir? Explain with neat sketches.
6. Write short notes on any two of the following:
 - Slotted Roller bucket & Solid Roller bucket
 - Stream lines & Equipotentials lines
 - Weir & Barrage
7. What are the various functions of diversion head works?
8. Give atleast two points each for the various functions of undersluice & divide wall?
9. What are the various causes of failure of weirs?
10. Explain in detail with neat sketch silt excluder & silt extractor.
11. What are the different types of weir? Explain with neat sketches.
12. Explain in detail with neat sketch silt excluder & silt extractor.
13. Write short notes on any two of the following:

Piping & Critical exit gradient.

14. Explain in detail with neat sketch Silt Ejectors.
15. List the various elements of diversion head works.
16. Explain in detail with neat sketch Silt Excluders.
17. Explain with neat sketches various types of weirs.
18. Give various functions of a cross regulator?
19. Explain the following types of fall with neat sketches:

(a) Rapid fall (b) Well type fall

20. Explain the various alignment of the off taking channel along with neat sketches?
21. Give various functions of a head regulator?
22. Explain the following types of fall with neat sketches:

(a) Ogee fall (b) Trapezoidal Notch fall

23. Give various functions of a cross regulator?
24. Explain the following types of fall with neat sketches:

(a) Vertical drop fall (b) Well type fall

25. Differentiate between Slotted Roller bucket & Solid Roller bucket along with neat sketches.
26. Differentiate between Metered and Non Metered fall by giving one example of each.
27. If Froude number is between 2.5 to 4.5 than the jump is known as?
28. Give discharge formula & shape for a crest of a fall if discharge is less than 14 cumecs
29. Explain in detail with neat sketches the various types of aqueducts ?
30. Give basic requirements of good canal outlet?
31. Define the following terms:
 - (i) Minimum Modular Head
 - (ii) Efficiency of an outlet
 - (iii) Drowning Ratio
 - (iv) Modular Range

32. Explain in detail with neat sketches the various types of aqueducts ?

33. Write a short note on the following:

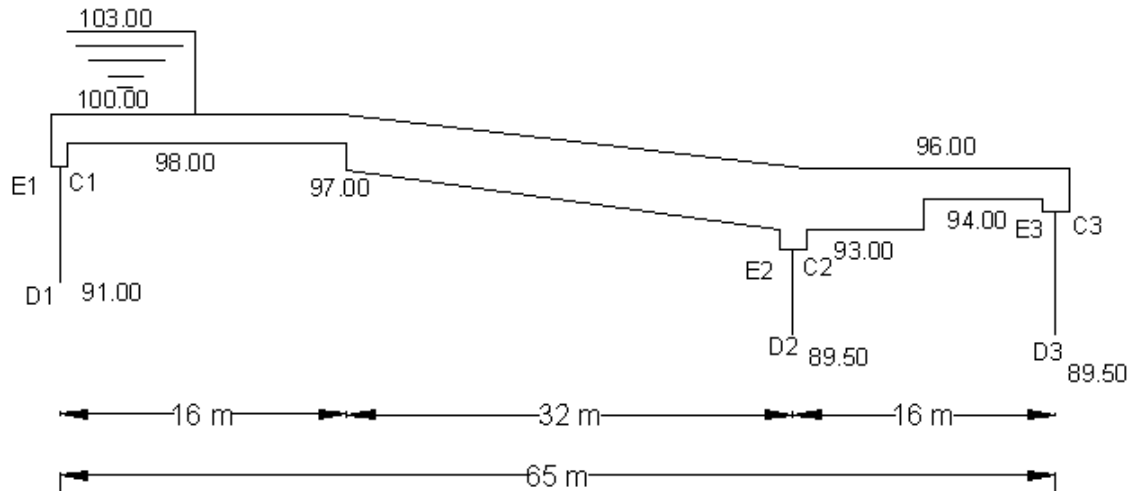
- (i) Non Modular ,
- (ii) Rigid Modules
- (iii) Semi Modules
- (iv) Submerged pipe outlet.

34. Define the following terms:

- (i) Flexibility
- (ii) Sensitivity
- (iii) Proportionality
- (iv) Setting

Ten mark Questions

- The various levels shown in the figure are in meters. Determine the uplift pressures at the key points E1,C1,D1 & E2,D2,C2.



- Explain in detail with proper diagram various component parts of a diversion head works?
- What are the five possibilities on which location of jump depends & give energy dissipation arrangements?
- Design a vertical drop weir on the basis of Bligh's theory (only hydraulic calculations along with top & bottom width of weir) for the following data:

Maximum flood discharge	= 2585 cumec
H.F.L. before construction	= 255.0 m
Minimum water level	= 248.0 m
F.S.L. of canal	= 254.0 m
Allowable afflux	= 1 m
Coefficient of creep 'C'	= 12
Silt factor	= 1
Head loss through regulator	= 0.5 m

5. What are the five possibilities on which location of jump depends & give energy dissipation arrangements for all five possibilities.
6. Design a cross regulator for a channel which takes off from the parent channel with the following data:

Discharge of parent channel = 140 cumecs ; Discharge of distributary = 140 cumecs ; F.S.L of parent channel, u/s = 210 m ; F.S.L of parent channel, d/s = 210 m ; Bed width of parent channel, u/s = 52 m ; Bed width of parent channel, d/s = 46 m ; Depth of water in the parent channel u/s & d/s = 2.5 m ; F.S.L of distributary = 209.10 m ; Silt factor = 0.8 ; Assume safe exit gradient = 1/5 ; Assume Y1 & Y2 = 0.8 & 1.8m.

7. Design a 1.5 metres sarda type fall for a canal having a discharge of 40 cumecs with the following data:

Bed level u/s = 105 m ; Side slope of channel = 1:1 ; Bed level d/s = 103.5 m ; F.S.L u/s = 106.8 m ; F.S.L d/s = 105.3 m ; Berm level u/s = 107.4 m ; Bed width u/s & d/s = 30 m ; Safe exit gradient for Khosla's Theory = 1/5.

8. Design an unflumed non meter baffle fall for the canal having the following data:

Full supply discharge = 30 cumecs ; Bed level u/s = 203 m ; Bed level d/s = 201.2 m

FSL u/s = 204.3 m ; FSL d/s = 202.5 m ; Bed width = 28 m ; Drop (HL) = 1.8 m ; Side slopes of channel = 1:1

9. Design a cross regulator for a channel which takes off from the parent channel with the following data:

Discharge of parent channel = 140 cumecs ; Discharge of distributary = 140 cumecs ; F.S.L of parent channel, u/s = 210 m ; F.S.L of parent channel, d/s = 210 m ; Bed width of parent channel, u/s = 52 m ; Bed width of parent channel, d/s = 46 m ; Depth of water in the parent channel u/s & d/s = 2.5 m ; F.S.L of distributary = 209.10 m ; Silt factor = 0.8 ; Assume safe exit gradient = 1/5 ; Assume Y1 & Y2 = 0.8 & 1.8m.

10. Design a suitable cross drainage work at the crossing of a canal & a drainage for the following data:

CANAL

Full Supply Discharge = 32 Cumecs

Full Supply Level = 213.5 m

Canal Bed Level = 212 m

Canal water depth = 1.5 m

Bed width = 20 m

Trapezoidal canal section with 1.5H : 1V Slopes

DRAINAGE

High Flood Discharge = 300 Cumecs

High Flood Level = 210 m

High Flood Depth = 2.5 m

General Ground level = 212.5 m

11. Explain in detail the various types of canals outlets?

12. Design a pipe outlet for the following data:

Full Supply discharge at the head of water course = 90 lit/sec

Full Supply level in distributary = 205 m

Full Supply level in canal = 204 m

13. Explain in detail with neat sketches various types of cross drainage works?