SHAHEED BHAGAT SINGH STATE TECHNICAL CAMPUS, FEROZEPUR

ROLL No: | | | | | | | | | | | | | **Total number of pages:[2]**

B.Tech. || CE || 7th Sem
Irrigation Engineering-II
Subject Code: BTCE-803
Paper ID:

Time allowed: 3 Hrs **Max Marks: 60**

Important Instructions:

- **All questions are compulsory**
- **Assume any missing data**

PART A (10x 2marks)

Q. 1. Short-Answer Questions:

(a) What is meant by term pond level?
(b) How would you compare weir and barrage?
(c) What is meant by piping in a hydraulic structure?
(d) What is hydraulic Jump?
(e) What are the essential requirements of a good canal outlet?
(f) What is a metering flume?
(g) What are modules and what is their importance in an irrigation canal system?
(h) Why are drops constructed in an irrigation canal?
(i) How would you compare an aqueduct and syphon-aqueduct?
(j) What do you mean by Critical Exit Gradient?

PART B (5×8marks)

Q. 2. A weir with a vertical drop has the following particulates: CO1

Nature of bed: Coarse sand with the value of Bligh's C = 12

Flood Discharge	= 300cumecs
Length of weir	= 40 m
Height of weir above low water	= 2.0 m
Height of falling shutter	= 0.6 m
Top width of weir	= 2.0 m
Bottom width of weir	= 3.5 m

Design the length and thickness of aprons by Bligh's theory.

OR

How does Khosla's theory differ from Bligh's theory with regard to the design of weirs on permeable foundations and also explain the criteria adopted in designing the various components of a weir built on permeable foundations using Khosla's theory. CO1

Q. 3. The discharge of water through a rectangular channel of width 8 m, is $15 m^3/s$ when depth of flow of water is 1.2 m Calculate (i) Specific energy of flowing water (ii) Critical depth and critical velocity CO2

OR

How does a diversion weir aligned? Draw a neat layout of diversion head CO2

works and indicate the various components of the system. Briefly indicate the function of each component.

Q. 4. Design a suitable cross- drainage work, given the following data at the crossing of a canal and a drainage. CO3

Canal

Full supply discharge = 33 cumecs
Full supply discharge = R.L. 231.5 m
Canal bed level = R.L. 211.0 m
Canal bed width = 20
Trapezoidal canal section with 1½H: 1V slopes.
Canal Water depth = 1.4m

Drainage

High flood discharge = 310cumecs
High flood level = 210.0 m
High flood depth = 2.5 m
General ground level = 212.5 m

OR

What are the different types of cross drainage works that are necessary on a canal alignment? State briefly the conditions under which each one is used. CO3

Q. 5. Design the salient dimensions of a syphon well drop for the following particulars: CO4

Fall = 3.8 m
General ground level = + 163.36 m
Full supply depth = 75 cm
Bed level upstream = + 162.83 m
Discharge = 1 cumec
Bed width upstream and downstream = 2.4 m

OR

Design a 1.5 meters Sarda type fall for a canal carrying a discharge of 40 cumecs with the following data: CO4

Bed level u/s = 105.0 m , Bed level d/s = 103.5m ,
Side Slope of channel = 1:1 , Full supply level u/s = 106.8 m ,
Full supply level d/s = 105.3 m , Berm level u/s = 107.4 m ,
Bed width u/s & d/s = 30m ,
Safe exit gradient for Khosla's Theory = 1/5

Q. 6. Design an irrigation outlet for the following data:

FSQ of the outlet = 50 lit/sec. CO5
FSL in distributary on u/s side of outlet = 200 m
FSL in water course on d/s side of outlet = 199.92 m
FSD in distributary on u/s side of outlet = 1.05 m

OR CO5

(a) What is meant by canal regulation and what are the different canal regulation works?

(b) Describe the necessity and functioning of a distributary head regulator and a cross regulator in a canal project.