



Department of Civil Engineering

Sample Question Paper for Water resource engineering II

Q1. Solve all questions mandatory

02 marks each

- Q1. 1 A cross drainage work is called a siphon when it carries the canal water
- below the drainage under pressure
 - below the drainage at atmospheric pressure
 - above the drainage at atmospheric pressure
 - none of the above
- Q1.2 The type of canal fall which can be universally used without any if and buts for moderate discharge of the order of 40 - 60 cumecs and low fall heights of 1 to 1.5m is
- vertical drop fall
 - baffle fall
 - ogee fall
 - glacis fall
- Q1. 3 In Lacey's regime theory the flow velocity is proportional to
- $(Qf^2)^{1/2}$
 - Q/f^2
 - $(Qf^2)^{1/6}$
 - $(Q/f^2)^{1/2}$
- Q1. 4 In Lacey regime channel a) The bed load is zero, b) the suspended load is zero, c) bed slope is a function of the fully supply discharge and the silt size. Which of the above statements is/are correct?
- a and b
 - c only
 - b and c
 - b only
- Q1. 5 If spillway length consists of 5 spans, the effective length of spillway crest is 54m which is 6m less than net clear length then calculate the design head on crest of spillway including velocity head for the corners rounded square nosed pier and abutment is rounded head.
- 16.67 m
 - 15.01 m
 - 16.30 m
 - 15.50 m
- Q1. 6 The critical velocity $V_o = 0.55 * m * d^{0.64}$ suggested by Kennedy for design of trapezoidal irrigation channels is, a) maximum permissible velocity, b) critical velocity, c) minimum permissible velocity, d) mean velocity
- a and b are correct

- II. a and c are correct
- III. b and c are correct
- IV. b and d are correct

Q1.7 A trash rack is not required at the entrance of a:

- I. Syphon spillway
- II. Drum gate installation
- III. Morning glory spillway
- IV. High head gate installation

Q1. 8 The only spillway among the following through which the discharge is almost at its capacity rate, even from the start of its functioning is

- I. Chute spillway
- II. Side channel spillway
- III. Ogee spillway
- IV. Syphon spillway

Q1. 9 The value of critical velocity ratio in Kennedy theory for sandy loam soil is

- I. 0.53
- II. 0.65
- III. 0.67
- IV. 0.70

Q1. 10 By using the central water power commission, the B/D ratio for discharge of 19 cumecs is

- I. 5.92
- II. 6.56
- III. 6.34
- IV. 5.84

Q1. 11 For the siphon to be operational even with small rise of water level above FRL,

- I. The priming depth should be high
- II. The depriming depth should be low
- III. The depriming depth should be high
- IV. The priming depth should be low

Q1. 12 In minor distributaries of canal, the discharge is usually:

- I. Less than 1/4 cumecs
- II. more than 1/4 cumecs
- III. Less than 1/6 cumecs
- IV. more than 1/6 cumecs

Q1. 13 If the full supply level of irrigation channel is reduced, there will be

- I. Less seepage loss
- II. More seepage loss
- III. Effective head will be more
- IV. Wasteful use of water

- Q1. 14 In a saddle siphon spillway the discharge through siphon is $61.03 \text{ m}^3/\text{s}$ and high flood discharge is 400 cumecs . Calculate the maximum operating head if throat width is 4.6 m , height is 2.2 m and HFL is 390 m . Assume coefficient of discharge as 0.65 .
- 5.267 m
 - 4.387 m
 - 5.825 m
 - 6.103 m
- Q1. 15 The limiting velocity asphalt concrete lining is
- 1.6 to 1.8
 - 1.6 to 2.0
 - 1.4 to 1.6
 - 1.4 to 1.8
- Q1. 16 The flexible canal outlet falls under
- Gibb's module
 - Crump's open flume outlet
 - Masonry sluice and orifice
 - All of the above
- Q1. 17 In functioning of canal outlet the efficiency and working head
- Are inversely proportional
 - Are directly proportional
 - Are equal
 - Has no relation
- Q1. 18 In a rapid fall the glacis sloping is
- $1 \text{ V}, 10 \text{ H}$
 - $1 \text{ V}, 5 \text{ H}$
 - $1 \text{ H}, 10 \text{ V}$
 - $1 \text{ H}, 5 \text{ V}$
- Q1. 19 If the tractive stress is 0.0035 kN/m^2 , Discharge is 48 cumecs , bed slope is $1/4700$, $N = 0.0225$. Calculate the area required for the channel section
- 52.46 m^2
 - 49 m^2
 - 51.32 m^2
 - 51 m^2
- Q1. 20 Calculate the value of rate of bed load transport per unit width of channel in KN/m/hr if manning's coefficient for rippled and plane bed is 0.0223 and 0.0113 respectively. Critical shear stress is $0.231 * 10^{-3} \text{ KN/m}^2$ and $R * S = 0.525 * 10^{-3}$.
- 3.12
 - 3.41
 - 3.30
 - 3.25

Q2 Solve any four

05 marks each

Q2.a With a labelled sketch explain in detail chute spillway or trough spillway

Q2.b Write short note on: 1. River intakes and 2. Trash racks

Q2.c A channel section has to be designed for the data also
find the longitudinal slope: $Q = 40$ cumecs, silt factor $f = 1$, Side
slope = $\frac{1}{2} : 1$

Q2.d What is canal lining? What are its advantages & state
suitability of canal lining material.

Q2.e Explain in detail the causes of waterlogging.

Q3 Solve any two

10 marks each

Q3.a An earthen dam made of homogeneous material has following data:

Coefficient of permeability of dam material = $5 * 10^{-4}$ cm/sec

Level of top dam = 205 m

Level of deepest river bed = 180 m

HFL of reservoir = 198 m

Width of top of dam = 4.5m

Upstream slope = 3:1

Downstream slope = 2:1

Determine the phreatic line for this dam section and discharge passing through the dam

Q3.b Explain briefly with neat sketches the different forces that may act on gravity dam. Indicate their magnitudes, directions and locations.

Q3.c Design a suitable section for overflow portion of a concrete gravity dam having downstream face sloping at slope of $0.7H : 1V$. The design discharge for the spillway is 8000 cumecs. The height of spillway crest is kept at RL 205m. The average river bed level at site is 105m. The spillway length consist of 6 spans having clear width of 10m each. Thickness of each pier may be taken as 2.7m.