Odd Semester Examination – 2019 (Back Paper)

Subject Code: TCE-504 **Total no. of printed pages: 3**

Roll No. | | | | | | | | | | |

B.Tech. (Semester-IV)

WATER RESOURCE ENGINEERING

Time: 3 Hours **Maximum Marks: 100**

NOTE-

(i) Attempt all question.
(ii) In case of numerical problem assume data if data is not provide.
(iii) Be precise in your answer

Question 1:- Attempt any four questions. **(4 x 5 = 20)**

(a) What is a cistern element in a fall? Explain.
(b) Design an irrigation channel to carry 50 cumec of discharge. The channel is to be laid at a slope of 1 in 4000. The critical velocity ratio for the soil is 1.1. use cutter's rugosity coefficient as 0.023.
(c) Define erosion. Also discuss the factor which influences the process of erosion.
(d) Describe briefly the factors affecting duty.
(e) Design an irrigation channel to carry 50 cumecs of discharge. The channel is to be laid at a slope of 1 in 4000. The critical velocity ratio for the soil is 1.1. use cutter's rugosity coefficient as 0.023.

Question 2:- Attempt any four questions. **(4 x 5 = 20)**

(a) What do you understand by a head regulator? State the function of distributary head regulator and a cross regulator.
(b) Discusses limitation of Bligh's theory.
(c) Estimate the depth and frequency of irrigation on the basis of soil moisture regime concept.
(d) Describe briefly the necessity of irrigation of irrigation works. Also describe different factors affecting water requirement of crops.
(e) Write the design step of Lacey's theory and design a regime channel for a discharge 50 cumec and silt factor 1.1 using lacey's theory.

P.T.O

Question 3:- Attempt any two questions **(10 x 2 = 20)**

(a) Sketch the layout of typical diversion headwork and describe briefly the function of various components of diversion head works.

(b) What is meant by falls and where they are located? Also discuss various types of falls along with sketches.

(c) Design an irrigation channel in alluvial soil according to laceys silt theory for following data.

Fully supply discharge = 10 cumec

Lacey's silt factor= .95

Side slopes of channel = ½ (H): 1 (V)

Question 4:- Attempt any two questions **(10x 2 = 20)**

(a) Explain the terms

Distribution system of canal irrigation system.
Spoil bank and borrow pit
Exit gradient and its importance
Crop rotation and its advantages
Hydropower and thermal power

(b) Design a 1.5m Sarda type fall for a canal having a discharge of 12 cumec, with the following data:

Bed level upstream= 103.0 m
Side slope of channel = 1:1
Bed level downstream = 101.5 m
Full supply level upstream = 104.5 m
Bed width u/s and d/s = 10m

Assume Bligh's coefficient = 6

(c) After how many days will you supply water to soil in order to ensure sufficient irrigation of the given crop, if

Field capacity of the soil = 22%

Permanent wilting point = 11%

Effective depth of root zone = 600 mm

Daily consumptive use of water for the given crop= 10 mm

Dry density of soil = 1.3 gm/cc

(Assume any other data, not given)

P.T.O

Question 5:- Attempt any 2 question **10 x 2=20**

a) Draw a neat layout of diversion head works and indicate the various component of the system. Briefly indicate the function of each component.

b) A horizontal impervious floor of 20m length is providing with a cutoff of 4m depth at its downstream end. Determine analytically the uplift pressure at point E & D and also the exit gradient if head cause seepage is 2m.

c) The culturable commanded area for a distributor is 15000 hec. The intensity of irrigation for Rabi (wheat) is 40% and for kharif (rice) is 15%. If the total requirement for the two crops are37.5 cm and 120 cm and their periods of growth are 160 days and 140 days respectively. (a) Determine the outlet discharge from average demand consideration. (b) Also determine the peak demand discharge, assuming that the kor water depth for two crops are 13.5 cm and 19 cm and their kor periods are 4 weeks and 2 weeks respectively.
