7E7061

Roll No. _____

Total No of Pages: 4

7E7061

B. Tech. VII Sem. (Main / Back) Exam., Nov. – Dec. - 2018

Civil Engineering

7CE1A Water Resources Engineering - I

Time: 3 Hours

Maximum Marks: 80

Min. Passing Marks: 26

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL

2. NIL

UNIT- I

Q.1 (a) Write short notes on the following- [8]

(i) Comparison of sprinkler and drip irrigation

(ii) Quality standard for irrigation water

(b) A watercourse has a culturable command area of 1100 hectares. The intensity of irrigation for crop A is 40% and for crop B is 30%, both crops being Rabi crops. Crop A has a Kor period of 20 days and crop B has a Kor period of 15 days. Calculate the outlet discharge of the water course if the Kor depth for crop A is 10 cm and for crop B is 16 cm. [8]

OR

Q.1 (a) What is subsurface irrigation? Differentiate between the natural subsurface irrigation and the artificial subsurface irrigation.

(b) Define the following terms- [8]

(i) Frequency of irrigation [8]

(ii) Crop rotation

(iii) Irrigation efficiencies

(iv) Consumptive use of water

UNIT- II

Q.2 (a) Discuss the factors governing the selection of alignment of main canal and its distributaries. [8]

(b) What are Lacey's basic regime equations? Starting from these equations, derive the equations for- [8]

(i) Wetted perimeter

(ii) Hydraulic radius

(iii) Bed slope

OR

Q.2 (a) Write short notes on the following- [8]

(i) Role of command area development

(ii) Estimation of channel losses

(iii) Rotational delivery

(iv) Silt control in canals

(b) Compare the Kennedy's and Lacey's theories for the design of alluvial channels. What are the drawbacks of both theories? [8]

UNIT- III

Q.3 (a) What are the basic principles of regulation of a canal system? Describe the methods of regulation of a canal system. [8]

(b) Define flexibility, setting, sensitivity, efficiency, proportionality, modular limits of a canal outlet. [8]

OR

Q.3 (a) What do you understand by river training works? Draw neat sketches of Guide banks and Spurs. Also explain their functions. [8]

(b) What do you understand by critical tractive force? Explain initial and final regime condition of channels. Also discuss the mechanics involved in sediment transport. *[8]*

UNIT- IV

Q.4 (a) What are saline, saline-alkali and alkali soils and explain how you will reclaim each one of these soils? [8]

(b) Differentiate between an open well and a tube well. What are the advantages of tube wells over open wells? [8]

OR

Q.4 (a) Explain the advantages and disadvantages of canal lining. [8]

(b) Design a trapezoidal shaped concrete lined channel to carry a discharge of 120 cumecs at a slope of 20 cm/km. The side slopes of the channel are 1.5:1. The value of N may be taken as 0.014. Assume limiting velocity as 1.5m/s. [8]

UNIT- V

Q.5 (a) What is Hydrological cycle? Give brief description of different components of hydrological cycle. [8]

(b) Describe run-off. Differentiate between direct run-off and base flow. What are various components of run-off? [8]

OR

Q.5 (a) Draw a neat diagram of Symon's rain gauge, clearly showing all its dimensions. How will you select a site for rain gauge station? [8]

(b) What is a unit hydrograph? What are the basic propositions and limitations of the unit hydrograph theory? [8]
