

M. Tech.-I (Civil-Hydraulic Engineering) (CBCS – 2015 Course) :

WINTER - 2018

SUBJECT : IRRIGATION WATER MANAGEMENT

Day : Wednesday

W-2018-3105

Time : 11.00 AM TO 02.00 PM

Date : 05/12/2018

Max. Marks : 60

N. B. :

- 1) All questions are **COMPULSORY**.
 - 2) Figures to the right indicate **FULL** marks.
 - 3) Answers to both the sections should be written in **SEPARATE** answer books.
 - 4) Draw neat and labeled diagram **WHEREVER** necessary.
 - 5) Use of non-programmable calculator is **ALLOWED**.
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SECTION - I

- Q. 1**
- a) What are different forms of water found in soil? State characteristics of these types of water. **(05)**
 - b) Explain the terms field capacity and wilting point. Explain their importance in crop productivity. **(05)**

OR

- a) State and describe factors affecting evapotranspiration. **(05)**
- b) Explain Thornthwaite method of estimating potential evapotranspiration. **(05)**

- Q. 2**
- a) Describe the check method of irrigation. Draw a layout plan of this method. **(05)**
 - b) Determine the time required to irrigate a border of 100 m long and 9 m wide with a stream of capacity 30 l/s. The irrigation is applied at 50 % soil water availability. The depth of root zone is 50 cm and bulk density of soil is 1.6 gm/cm³. Available water holding capacity of soil is 20 % . **(05)**

OR

- a) Explain with a neat sketch furrow method of irrigation. State the types of crops for which it is suitable. **(05)**
- b) Compare between check basin method and border method of irrigation. **(05)**

- Q. 3**
- a) Explain in brief rotary head sprinkler system. **(05)**
 - b) Describe design of sprinkler system with respect to spread of sprinkler and rate of application. **(05)**

OR

- a) Draw a schematic plan of drip irrigation system showing various components. **(05)**
- b) State different types of data to be collected for design of drip irrigation system. **(05)**

P. T. O.

SECTION - II

- Q. 4** a) Explain construction and principle of working of a cut throat flume. (05)
- b) Compute the discharge in litres/seconds over a 90° triangular weir if the depth of water flowing over the weir is 12 cm measured at a 2 m upstream. (05)

OR

- a) Describe the submerged and free flow orifices with appropriate sketches. (05)
- b) Explain the term water use efficiency. (05)

- Q. 5** a) Explain the climatological approach for deciding the time of irrigation. (05)
- b) State and explain in brief factors influencing frequency of irrigation. (05)

OR

- a) Explain the plant criteria for scheduling irrigation to crops. (05)
- b) Explain advantages and disadvantages of underground pipe line system of irrigation. (05)

- Q. 6** a) What precautions are to be taken when saline water is to be used for irrigating crops? (05)
- b) Classify the irrigation water based on electrical conductivity and sodium hazard. (05)

OR

- a) Explain any one method of reclamation of saline soils. (05)
- b) Explain the causes of salinity in soil. What are the effects of saline soils on growth of crops? (05)

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