

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**PDDC - SEMESTER-VII EXAMINATION – SUMMER 2016**

**Subject Code: X70605****Date: 05/05/2016****Subject Name: Irrigation Water Management****Time: 02:30 PM to 05:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Discuss the commonly used irrigation indices in scheduling irrigation. **07**  
(b) What are the effects of saline water on irrigated land? Which precautions should be taken during use of saline water? **07**
- Q.2** (a) Describe the maintenance of sprinkler nozzles. Give expression for nozzles discharge and process of calculating nozzle diameter. **07**  
(b) An irrigation system of 0.15 cumecs is irrigating a ring basin of radius 7m. The water holding capacity of soil is 23% per meter depth. Prior to water application, the moisture content of the soil is found 8.2%. The depth of root zone is 1.5m. The apparent specific gravity of the root zone soil is 1.9. How long irrigation stream would be applied to the basin to replenish the root zone moisture to its field capacity. **07**
- OR**
- (b) Plan a suitable drip irrigation system for an orchard on nearly flat land with medium heavy soil. The dimensions of the fields are 420×180m. The source of water is a tube well located at the top corner of farm. The tree spacing is 5×5 m. Emitters are spaced 1m apart in each lateral. The monthly evaporation rate observed with a class A pan is 250mm. Irrigation is to be applied daily. Determine the discharge capacity of the drip irrigation system. Take, maximum diameter of wetted circle form by a dripper = 2.5m, crop coefficient for orchard=0.8, pan factor=0.8, water application efficiency is 87%. **07**
- Q.3** (a) Discuss how various irrigation efficiency indicators can be used for performance evaluation of canal irrigation system. **07**  
(b) (I) Explain WUO. **07**  
(II) Give the advantage of subsurface drainage in comparison to surface drainage.
- OR**
- Q.3** (a) Explain moisture distribution patterns and uniformity of coverage for sprinkler irrigation. **07**  
(b) Draw Schematic layout of typical drip irrigation system. Enlist component of it. **07**
- Q.4** (a) What are the factors affecting land leveling requirement? Distinguish between land leveling and land smoothening. **07**  
(b) Give difference between border strip irrigation and check basin irrigation. **07**
- OR**
- Q.4** (a) Explain how remote sensing and GIS can be used for monitoring of irrigated areas. Explain soil moisture studies by use of remote sensing in this context. **07**  
(b) What is accumulated infiltration in furrow? What is the principle of cutback stream in furrow irrigation? **07**

- Q.5** (a) What are the limitations in the large scale adoption of sprinkler irrigation in many of the developing countries? **07**
- (b) Define Frequency of irrigation. Explain factors affecting of it. **07**
- OR**
- Q.5** (a) Define application, storage and water use efficiency and explain how application efficiency can be improved. **07**
- (b) Define leaching. Write short note on 'Reclamation of saline soils by leaching method'. **07**

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