PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
B. Tech Winter 2019-20 Examination

Semester: 5   Date: 05/12/2019
Semester Code: 03110303   Time: 10:30 am to 01:00 pm
Subject Name: Irrigation Engineering   Total Marks: 60

Instructions:
1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new questions on new page.

Q.1 Objective type questions (All are Compulsory)   (15)

1. Lysimeter is used to measure
   A. Evaporation   B. Evapotran-   C. Atmospheric   D. none of these
                             spiration   pressure
2. Which method is used for estimation of evaporation
   A. water budget   B. energy balance   C. mass transfer   D. All of these
      method   method   method
3. A contracted trapezoidal weir in which each side of the notch has a slope of 1 horizontal to 4 vertical is
   A. trapezoidal   B. cipoletti weir   C. rectangular weir   D. v-notch
      weir
4. A Persian wheel with an average discharge of 230 liter/min irrigates one hectare wheat crop in 50 hours. The average depth of irrigation is
   A. 6.9 cm   B. 7.2 cm   C. 9.0 cm   D. 9.6 cm
5. A sheet of water, which overflows a weir is,
   A. head   B. nape   C. both   D. none of these
6. The depth of the flow over sharp crested rectangular weir should not be more than about;
   A. half the crest   B. two third of the C. three fourth of   D. the width of the weir
      width   crest width   the crest width
7. The gauge used to measure the depth of flow over a weir is located upstream of the weir at a distance of about;
   A. twice the   B. thrice the   C. four times the   D. five times the approximate
      approximate   approximate   approxi-mate   head
      head   head   head
8. The most efficient equipment for making ridges in the layout of fields for irrigation borders and large size check basins is;
   A. bund former   B. a-frame ridger   C. disc ridger   D. double mould board plough
9. In gravimetric method of soil moisture measurement, soil samples are placed in oven at .... ^{0}C temperature for .... hours.
   A. 105, 24   B. 105, 48   C. 110, 24   D. 110, 48
10. The soil moisture tension at field capacity generally ranges from ....
    A. < 1/3 atm   B. 1/10 to 1/3 atm   C. 1/20 to 1/30 atm D. 1/40 to 1/50 atn
11. The particle diameter of clay is ......
    A. <0.02 mm   B. < 0.002 mm   C. < 0.0002 mm   D. > 0.002 mm
12. The overland flow in an irrigation border strip is a case of ;
    A. steady flow   B. unsteady flow   C. steady flow   D. unsteady flow with decrea-
                                                  with decrea-   sing discharge
                                                  sing discharge
13. The minimum land slope required in land irrigated with surface methods of water application is ;
    A. 0.01 %   B. 0.05%   C. 0.1%   D. 0.15%
14. Electrical conductivity of a soil solution is the measure of,
    A. soil dryness   B. soil iron   C. soil salinity   D. clay content of soil
                             content
15. saline soil can be reclaimed by
    A. leaching   B. scrapping   C. adding gypsum   D. growing salt tolerant crops

Q.2 **Answer the following questions(Attempt any three)**
1. Write list of various types of methods used for water measurement? Explain all the method in detail. **(15)**
2. Write a short note on: (a) Basin Irrigation
                          (b) Irrigation Efficiency.
3. A soil sample has a porosity of 40%. The specific gravity of solids is 2.70. Calculate (1) void ratio (2) dry density (3) unit weight if the soil is 50% saturated and (4) unit weight when completely saturated.
4. What is meant by Field Capacity? Explain the field method of determining field capacity.

Q.3 A. What are the surface methods of water application? Explain in detail **(07)**
   B. Explain components of sprinkler irrigation with neat sketch. **(08)**

<div align="center">OR</div>

   B. Solve problems **(08)**
   1. Wheat crop requires 45 cm of irrigation water during 120 days irrigating period. How much land can be irrigated with a flow of 20 liters per second for 22 hours a day?
   2. Estimate the mean velocity of flow and carrying capacity of a lined canal water course, rectangular in section with a bottom width of 50 cm and depth of flow of 25 cm (inside). Single layer bricks are laid in cement mortar with a cement plaster 8 mm thick. The slope of the channel bed is 2 meters per kilometre. Take Manning's roughness coefficient n = 0.015.

Q.4 A. What is participatory irrigation management? What are the objectives of PIM? **(07)**

<div align="center">OR</div>

   A. An undisturbed soil sample was collected from a field two days after irrigation, when the soil moisture was near field capacity. The inside dimensions of the core sampler were 7.5 cm diameter and 15 cm deep. Weight of the core sampling cylinder with moist soil was 2.76 kg and the weight with oven dry soil was 2.61 kg. The weight of the core sampling cylinder was 1.56 kg. Determine the water depth in centimetre per meter depth of soil. **(07)**

   B. Explain soil moisture constants with diagram. **(08)**