KERALA AGRICULTURAL UNIVERSITY

B.Tech.(Ag. Engg.) 2016 Admission

V Semester Final Examination-January 2019

Iden.3107 **Sprinkler and Micro Irrigation Systems (1+1)**

Marks: 50

Time: 2 hours

I **Fill up the blanks** **(10x1=10)**

1 Minimum operating pressure required for operation of perforated pipe system is_____.

2 Calcium phosphate is _____ in water.

3 In pellet application ratio of soil and fertilizer is _____.

4 Starter solution is used in _____ stage of plant growth.

5 State Bernoulli's equation of fluid flow mathematically.

6 Give names of 3 nutrients that can be used in fertigation.

Match the following.

	A		B
7	Mannings equation	a	More infiltration
8	Sandy soil	b	Roughness coefficient
9	Sprinkler irrigation	c	Most effective irrigation
10	Drip irrigation	d	Artificial rainfall condition

II **Write Short notes on any FIVE of the following** **(5x2=10)**

1 Name parts of sprinkler head. (at least six)

2 Define fertigation.What is the ratio of nutrients in starter solution for effective growth of seedlings?

3 Differentiate between "Solid set System and Permanent set System".

4 Differentiate between "Low pressure sprinklers and high pressure sprinklers".

5 Common methods of fertilizer injection in pressurized irrigation system.

6 Jet break up index and its value for best distribution.

7 A lateral has 12 sprinklers spaced 14 meters apart. The laterals are spaced 20 meters apart on the main line. Determine the amount of fertilizer to be applied at each setting when the recommended fertilizer dose is 80 kg /ha.

III **Answer any FIVE of the following.** **(5x4=20)**

1 Merits and demerits of drip irrigation system.(at least 4 points each)

2 Subsoil injector.(at least 8 points)

P.T.O

3 A sprinkler irrigation system is to be designed to irrigate 8 hectares of vegetable crops in deep silt loam soil in moderate dry climate. The field is flat. Determine the limiting rate of application, the irrigation period, the depth of water pumped per application and required system capacity in ha-cm- per day. Assuming that the system is operated for 15 hours each day, determine the pump capacity in litres /sec.Given limiting application rate 1.3 cm/hr, moisture holding capacity of soil 9.5 cm/m depth.Depth of root zone is 60cm., irrigation is started at 50% moisture depletion with 75% application efficiency.Assumed peak moisture used by crop is 5mm/day.

4 Determine the required capacity of a sprinkler system to apply water at the rate of 1.25cm/hr. Two 186m long sprinkler lines are required. Sixteen sprinklers are spaced at 12 m intervals on each line. The spacing between lines is 18 m.

5 Uniformity coefficient and its usability with appropriate formula.

6 Hose pull system of sprinkler irrigation.

7 Principle of spray production at sprinkler head.

IV Answer any ONE of the following **(1x10=10)**

1 Design of sprinkler irrigation system.

2 Design of drip irrigation system.