

EASTERN UNIVERSITY, SRI LANKA
SECOND YEAR SECOND SEMESTER EXAMINATION IN AGRICULTURE -2013/2014
(September 2015)

AE 2201 – IRRIGATION AND WATER MANAGEMENT (3:30/30)

Answer all questions

Time: 2 hours

01. (a) Define the following terms.

- (i) Capillary water
- (ii) Depletion Level
- (iii) Gross water requirement
- (iv) Particle Density

(b) A discharge of 29 *lit/sec* is applied to a banana field of size 135m². The field capacity of the soil is 16% and the bulk density is 1.4g/cm³. Moisture content of the soil in the crop root zone before starting irrigation is 9%. The average depth of crop root zone is 140cm. Determine the NIR and duration of irrigation to replenish the root zone moisture to its field capacity.

02. (a) What do you mean by the followings;

- i. Effective rainfall
- ii. Irrigation water need
- iii. Irrigation period

(b) Write short notes on the followings;

- i. Factors affecting infiltration rate
- ii. Soil moisture characteristic curve

(c) A Persian wheel discharges at the rate of 11,200 litres per hour and works for eight hours each day. Estimate the area commanded by the water lift if the average depth of irrigation is 8 cm and irrigation period is 15 days.

(PTO)

03. (a) Give two (02) important formulae used to calculate the velocity of flow in a channel
- (b) Briefly discuss about the rectangular weirs which are used to measure the flow of small streams.
- (c) Find the Water conveyance efficiency (E_c), Water application efficiency (E_a), Water storage efficiency (E_s) and Water distribution efficiency (E_d) using the following field data.

$Q = 149$ lit/sec diverted from the canal

$Q = 105$ lit/sec delivered to the field

Size of the field = 1.4 ha

Irrigation period = 8 hrs

Effective RZ = 1.75 m

Runoff loss in the field = 500m^3

Depth of water penetrated varied linearly from 2m at head to 1.25 m at tail of the field.

Available moisture holding capacity = 25cm/m

MAD (or DL) value = 45%

04. (a) List the advantages and disadvantages of micro irrigation methods
- (b) State the importance of the wetting pattern of different soil types and causes for the poor wetting pattern.
- (c) Explain about the cascade method of irrigation
- (d) Furrows 105 m long and spaced 85cm apart were irrigated by an initial stream of 2.5 lit/sec. The initial stream reached the lower end of the field in 40 minutes. If the size of the stream was then reduced to 0.75 lit/sec and continued for one hour, estimate the average depth of irrigation.
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