

UNIVERSITY OF RUHUNA
THIRD EXAMINATION IN BSc AGRICULTURAL RESOURCE MANAGEMENT AND TECHNOLOGY
(PART I)

July/August- 2022

EN3101-Irrigation and Water Resources Engineering

M.C.Q. Type

TIME: 30 Minutes

Index Number

Answer ALL questions.

Mark your answers by placing "√" against the selected alternative among the five alternatives provided in each question.

Questions with multiple answers will not be evaluated.

Only non-programmable calculators are permitted.

Mobile phones are not permitted.

1. Select the answer based on the given statements.
 - A. Irrigation provides moisture essential for crop growth
 - B. Irrigation increase tillage efficiency by softening the hard pans and clods in the soil
 - C. Irrigation is performed in harvesting of certain roots crops
 - i. All statements are incorrect
 - ii. Only statements "A" is correct
 - iii. Only statement "B" is incorrect
 - iv. Only statement "C" is incorrect
 - v. Statement "A" and "B" are incorrect

2. Select the correct answer based on the given two statements
Statement A: Field capacity (FC) is very important in irrigation scheduling.
Statement B: Field capacity is the moisture content of a soil after removing of capillary water.
 - i. Both statements A and B are individually true, and B is the correct explanation of A
 - ii. Both statements A and B are individually true, but B is not the correct explanation of A
 - iii. Statement A is true, and B is false
 - iv. Statement A is false, and B is true
 - v. Both two statements are false

3. Select the correct answer based on the given statements.
 - A. Tensiometer can be used for the measurement of soil moisture tension at Permanent Wilting Point.
 - B. The curve drawn in between soil moisture percentage and soil moisture tension is known as the soil moisture characteristics curve.
 - C. Water film thickness around soil particles increases with the increasing soil moisture tension.
 - i. All statements are incorrect
 - ii. All statements are correct
 - iii. Only statements "B" is correct
 - iv. Only statement "C" is incorrect
 - v. Statement "A" and "C" are incorrect

4. Bulk density, true density and porosity of a soil are 1.5 g/cm^3 and 2.0 g/cm^3 and 25.00 %, respectively. If the Field Capacity and Permanent Wilting point of the soil are 18 % and 10 % in dry weight basis, what would be available water in the soil for plants?
 - i. 08.00 %
 - ii. 01.80 %
 - iii. 15.00 %
 - iv. 27.00 %
 - v. 20.80 %

5. Select the correct statement based on the given statements
- A. Irrigation efficiency of furrow irrigation is lower than that of drip irrigation.
 - B. Irrigation efficiency can be improved in surface irrigation systems.
 - C. Quantity of irrigation water required for a crop is a function of the crop types.
 - i. All statements are incorrect
 - ii. All statements are correct
 - iii. Only statements "A" and B are correct
 - iv. Only statement "B" and "C" are incorrect
 - v. Statement "A" and "C" are incorrect

6. The list "I" and "II" shows the groups of a few terms used irrigation scheduling and their descriptions, respectively. Select the correct answer that shows correct match of two lists.

List I	List II
A- ET_{Crop}	1- The amount of water required to fulfil the demand of water by the crop
B- IWN	2- Water loss through evaporation and transpiration by a crop
C- ET_P	3- Rate of evapotranspiration from a reference crop surface
D- ET_0	4- Maximum evapotranspiration of a crop when sufficient moisture is available in the soil

- i. A-1, B-3, C-2, D-4
- ii. A-2, B-4, C-1, D-3
- iii. A-4, B-2, C-3, D-1
- iv. A-3, B-1, C-4, D-2
- v. A-2, B-1, C-4, D-3

7. Select the correct answer based on the given two statements

Statement A: Wind affects the evaporation by removing the water vapor one produced just upon the water surface.
Statement B: Rate of evaporation is a function of vapor gradient in between the evaporating surface and the atmosphere.

- i. Both statements A and B are individually true, and B is the correct explanation of A
- ii. Both statements A and B are individually true, but B is not the correct explanation of A
- iii. Statement A is true, and B is false
- iv. Statement A is false, and B is true
- v. Both two statements are false

8. Select the correct answer based on the given statements.

- A. Agriculture takes the second place in the water consumption in the world.
- B. Water used for agriculture in developing countries is much higher than that of high-income countries.
- C. The main objective of irrigation is to maintain a favorable plant water environment for proper crop growth.

- i. All statements are correct.
- ii. Only statements A and B are correct.
- iii. Only statements A and C are correct.
- iv. Only statements B and C are correct.
- v. All statements are incorrect.

9. The most accurate method of soil moisture determination is

- i. Gypsum blocks method.
- ii. Neutron probe method.
- iii. Tensiometer method.
- iv. Gravimetric method.
- v. Sensor that uses the electric and dielectric properties.

10. Select the correct answer based on the given statements

- A. The general value for soil moisture tension at field capacity and permanent wilting point would be 0.33 bar and 15 bar, respectively.
 - B. The maximum amount of water in a soil would be at the saturation capacity.
 - C. The optimum water absorption by plants occurs around the field capacity of the soil.
- i. All statements are correct.
 - ii. Only statements A and B are correct.
 - iii. Only statements A and C are correct.
 - iv. Only statements B and C are correct.
 - v. All statements are incorrect.

11. Select the correct statement

- i. The irrigation efficiency is the ratio expressed as a percentage of volume of irrigation water used by the plants to the total volume of water evaporated.
- ii. Water distribution efficiency indicates the how efficient the water transport system which takes water from the water source to the field.
- iii. There is a direct relationship between the amounts of water transpired from a crop to its potential yield.
- iv. Penman-Monteith approach is more accurate than the Lysimeter for the determination of crop evapotranspiration.
- v. The influence of solar radiation on the evapotranspiration is much less than wind speed.

12. Select the incorrect statement

- i. The suitability of irrigation water depends various factors including the quality of irrigation water.
- ii. There is a direct relationship in between electrical conductivity and total dissolved solids of water.
- iii. Electrical conductivity in water generally less than 3.0 dS/m is suitable for irrigation.
- iv. Soil salinity can be developed when the saline water is used for irrigation.
- v. Sodium, Magnesium and Calcium concentration in water is required for the determination of electrical conductivity of water

13. A crop is irrigated with water having electrical conductivity (EC) of 1.25 dS/m. The expected leaching fraction is 0.25. EC of percolating water from the bottom of the root zone would be?

- i. 0.31 dS/m
- ii. 1.00 dS/m
- iii. 1.50 dS/m
- iv. 6.00 dS/m
- v. 5.00 dS/m

14. Which one of the following is NOT a direct stream flow measurement technique?

- i. Dilution method
- ii. Velocity-area method
- iii. Slope-area method
- iv. Volumetric method
- v. Float method

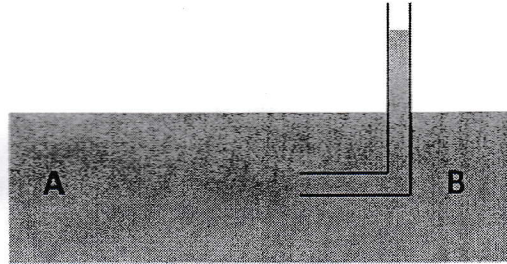
15. Which of the following is the best instrument for measuring the velocity of a stream flow?

- i. Pitot tube
- ii. Current meter
- iii. Surface float
- iv. Sub-surface float
- v. Venturi meter

16. Weirs are used for;
- Measuring the amount of silt entering the canal.
 - Measuring the velocity of the flow
 - Measuring the discharge
 - Measuring the cross-sectional area
 - Measuring the hydraulic gradient.
17. Water present in an artesian aquifer is usually;
- Under atmospheric pressure
 - Below the atmospheric pressure
 - Above the atmospheric pressure
 - Under half of the atmospheric pressure
 - None of the above
18. The yield of a well depends upon;
- Permeability of soil
 - Area of aquifer opening to the well
 - Actual flow velocity
- Only A is correct.
 - A and B are correct
 - A, B and C are correct
 - B and C are correct.
 - Only B is correct.
19. Soybean is to be grown under border irrigation. The infiltration opportunity time and stream size are 60 minutes and 4 L/s respectively. If irrigation need is 400 m³/ha, the border length would be;
- 60 m
 - 360 m
 - 600 m
 - 6000 m
 - 21600 m
20. The factor does not effect on deciding the Furrow length is?
- Furrow slope
 - Field length
 - Cultivation practice
 - Water quality
 - Hydraulic conductivity
21. Three identical objects have been released into Petrol Water and Glycerol tanks separately, chose correct statement about the vertical velocity of the objects in the fluids,
- All three objects will have same vertical velocities
 - Object in the Glycerol will have the highest velocity
 - Objects in the water and petrol will have same velocities
 - Object in the petrol will have the lowest velocity
 - All three objects will have three different vertical velocities
22. The coefficient of discharge C_d of an orifice is always,
- Greater than C_c
 - Equal to C_v
 - Equal to C_c
 - Less than C_c
 - Greater than C_v

23. The figure illustrates L shaped glass tube inserted in to a liquid for the purpose of flow measurements. The incorrect statement about the system would be,

- i. The flow particles flowing in the tube center has been stagnated
- ii. This should be an open channel
- iii. The liquid must be travelling
- iv. The liquid must be travelling from A to B direction
- v. The liquid must be travelling from B to A direction



24. Correct statement about orifice meter and venturi meter would be,

- i. Orifice meter is expensive than Venturi meter
- ii. Venturi meter is easy to use
- iii. Venturi meter is always better than orifice meter
- iv. Venturi meter can only be used inside a factory
- v. Venturi meter can be used with digital pressure gauge display

25. Differences between pneumatic and hydraulic systems would be,

- i. pneumatic systems will have precise distance movements than hydraulic systems
- ii. pneumatic systems could handle very high pressure than hydraulic systems
- iii. **hydraulic systems can handle very high pressure than pneumatic systems**
- iv. pneumatic system will always have clean workplaces
- v. hydraulic systems are commonly used in food processing systems

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