Lwre.3107   **Water Harvesting and Soil Conservation Structures (2+1)**   **Marks: 50**
Time: 2 hours

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

1.   Mechanical measures for soil & water conservation are suitable for land slopes more than .... %.
2.   Commonly used permanent gully control structures are drop structure, ...and ....
3.   Critical depth is the depth of flow at which the specific energy is ....
4.   During hydraulic jump, the flow velocity changes from ....to ....
5.   If discharge per unit width in an open rectangular channel is 3.0 m^3/s/m, the critical depth will be...............

State True or False

6.   Numerically, the value of runoff coefficient varies from 0 to 1.
7.   Water harvesting from seasonal streams can be done by means of diversion structures.
8.   Hydraulic design of permanent structure determines the peak runoff rate for the structure.
9.   Uplift pressure on the drop structure causes restoring moment.
10.   Chute spillway does not have any conduit.

II   **Write short notes on ANY FIVE of the following**   **(5x2=10)**

1.   Permanent gully control structures
2.   Specific energy
3.   Straight apron outlet
4.   Short-term water harvesting technique
5.   Hydraulic jump\
6.   Check dams
7.   Saint Antony Falls (SAF) stilling basin

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

1.   Classify soil erosion control structures and discuss their functional requirements.
2.   Discuss applications of hydraulic jump. Write the expression for estimating the energy loss (ΔE) during the hydraulic jump in a rectangular channel if the initial depth and sequent depth are represented by y_1 and y_2 respectively.
3.   Draw a neat diagram of a straight drop structure showing all its major components.
4.   Draw a sketch of a farm pond and indicate all the main components.
5.   Discuss water harvest techniques on the basis of storage period.
6.   Explain hydraulic design of straight drop structures.
7.   In a rectangular open channel, the discharge per unit width was recorded as 3.2 m^3/s/m during the occurrence of hydraulic jump. Determine the sequent depth and the energy lost during the jump, if the depth of flow before the jump is 0.35 m.

IV   **Write an essay on ANY ONE of the following**   **(1x10=10)**

1.   Chute Spillway
2.   Drop inlet spillway

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