



**KERALA AGRICULTURAL UNIVERSITY**  
**B.Tech. (Ag. Engg.) 2016 Admission**  
**V Semester Final Examination-January 2019**

**Lwre.3107      Water Harvesting and Soil Conservation Structures (2+1)**

**Marks: 50**  
**Time: 2 hours**

**I      State True/False      (10x1=10)**

- 1    Constructions of bunds are not recommended in deep black soils
- 2    Importance of harvested water is greater in high rainfall areas
- 3    Grassed waterways are lined with live grasses.
- 4    The most economical shape of a grassed waterway is parabolic
- 5    Harvested water is not suitable for fish farming
- 6    Water conservation in the soil is also a kind of water harvesting.
- 7    The dugout farm ponds are constructed for flood control
- 8    The side slope in an earthen farm pond is kept as 1:1.
- 9    A retaining wall retains the earth or soil.
- 10   Masonry structures are very strong regarding tensile strength

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

- 1    Draw labelled top view of a hydraulic jump
- 2    Loads on head wall
- 3    Creep line theory
- 4    Safety against sliding
- 5    Safety against crushing
- 6    Design steps of a SAF stilling basin
- 7    Design steps of an earthen embankment

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

- 1    Hydraulic and hydrologic design of a drop spillway.
- 2    Structural design and stability analysis of a chute spillway.
- 3    Hydraulic and hydrologic design of a drop inlet spillway.
- 4    Structural design and stability analysis of a straight drop spillway.
- 5    Design of diversion structures.
- 6    Straight apron.
- 7    *Nala* bunds and its limitations.

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

- 1    What do you understand by rooftop water harvesting system? Draw a labelled and neat sketch of a rooftop water harvesting system.
- 2    Calculate the volume of excavation required to construct a dugout farm pond if:
  - (a) Average depth of pond is 4.5m
  - (b) Bottom width is 12m
  - (c) Bottom length is 25m
  - (d). Side slope is 2:1

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