B.Sc. (Honours) Agriculture Examination, 2018
Semester-II
Course No: AEG-121
(Introductory Soil & Water Conservation Engineering)

Signature of Centre Superintendent

Roll No. : (in figure) _____ (in words) _____

Student Index No. _____ Regn. No. _____ of _____

Time : Two Hours **Full marks : 50**

Questions are of value as indicated in the margin

Part - I
(Objective and Short Answer Type)
(Use only ball point pen)

Time : 30 minutes **Full marks : 20**

Note: 1. Answer in question paper itself.
2. Striking, rewriting or overwriting are not allowed in the objective type questions.

1. **Fill up the blanks with most appropriate words :** 5×1=5

(a) In USLE topographic factors consists of slope length factor and _____ factor.

(b) _____ type bench terrace is adopted in medium rainfall areas and for paddy cultivation.

(c) _____ is a control measure for wind erosion

(d) If $225^0 30'$ is whole circle bearing of a line, then the quadrental bearing is _____

(e) The difference between fore bearing and back bearing is _____

2. **Tick (✓) the correct alternatives :** 5×1=5

(a) The angle between the lines AB and BC whose respective bearings are 35^0 and 140^0 is
(i) 75^0 (ii) 115^0 (iii) 175^0 (iv) 185^0

(b) For a bench terrace constructed in 20% slope, the V.I. is (i) 2m (ii) 5m (iii) 4m (iv) 2.5m if width of the terrace is 20 m and batter slope is 1:1.

(c) The V.I. of a contour bund constructed at 5^0 land slope is 1.05 m, the H.I. will be (i) 1.05 m (ii) 11.47 m (iii) 12 m (iv) 13.5 m.

(d) For a watershed, USLE computes (i) annual runoff (ii) Average annual soil loss
(iii) erodibility factor (iv) average annual rainfall.

(e) Contour bunds are suitable with the land slope of
(i) 2-7% (ii) 10-15% (iii) 16-20% (d) 21-30%

3. Answer the following questions (any five) : 5×2=10

(a) Mechanisms of water erosion

(b) Contour bunding system

(c) Manning's and Chezy's formula

(d) Gully erosion development

(e) Rill erosion

(f) The length of a survey live was measured with a 30 m chain and was found to be 1565 m. When the chain was compared with a standard, it was found to be 0.15m too short. Find the correct length of the line

(g) Pipe outlet for contour bunding

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Part – II

(Descriptive Type)

Time : 90 Minutes **Full marks : 30**

Questions are of value as indicated in the margin

Answer *any three* questions

4. (a) What are the different forms of water erosion? Explain
   (b) What are the different stages of gully development? Briefly explain different gully control structures 3+7=10
5. (a) What are the different types of bench terraces? Explain briefly with figure.
   (b) On a 25% hill slope, it is proposed to construct bench terrace. If vertical interval is 2m, calculate (i) terrace length/hectare; (ii) earthwork; and (iii) area lost. If no batter slope is provided and 1:1 batter slope is considered. 3+7=10
6. Design a grassed trapezoidal grassed water-way to carry a peak discharge of 3.5 m^3/s. Channel slope is 2%. As the grass cover is excellent, the maximum non-erosive velocity of water through the channel may be taken as 2.5 m/s. Assume manning's n as 0.04 and channel side slope 1.5:1 10
7. (a) Briefly explain different modes of transportation of soil particles in wind erosion. Differentiate between shelter belt and wind break.
   (b) State Universal Soil soll equation and explain different parameters in it. 5+5=10
8. (a) Define whole circle bearing and reduced bearing with example. Also define true meridian and magnetic meridian.
   (b) Below are the bearings observed in traversing with compass. Compute the included angle.

4+6=10

Line	Fore bearing	back bearing
AB	$80^0 30'$	$260^0 30'$
BC	$351^0 15'$	$173^0 0'$
CD	$32^0 15/$	$208^0 0'$
DE	$106^0 15'$	$287^0 45'$
EF	$99^0 0'$	$280^0 0'$
FG	$209^0 30'$	$29^0 30'$
