

Marks Scored:

KATHMANDU UNIVERSITY  
End Semester Examination  
February/March, 2018

Level : B. Sc.

Course : ENVS 338

Year : III

Semester : I

Exam. Roll No. :

Time: 30 mins.

F. M. : 20

Registration No. :

Date. MAR 09 2018

SECTION "A"

[10Q × 0.5 = 5 marks]

Mark "X" in the appropriate box.

1. Bamboos have relatively effective engineering function than other vegetations for:  
 Catch                       Armour                       Reinforce                       Anchor
2. Preparation for plant propagation is done in which of the following phase of bioengineering?  
 Planning                       Designing                       Implementation                       Maintenance
3. Checking for grass cutting operation (maintenance) is generally done in .....  
 Ashad                       Bhadra                       Kartik                       Poush
4. A slope is said to be stable if the value of "Factor of Safety" is:  
 Less than 1                       More than 1                       Equal to 1                       Less or equal to 1
5. *Amliso, Padang bans* for example have ..... root types:  
 Tap                       Fibrous                       Adventitious                       Rhizomatous
6. Breast walls normally represent.....  
 Revetment walls                       Retention walls                       Prop walls                       Dentition walls
7. Length of spur should not exceed ..... of the normal width of stream from the desired bank line  
 20%                       10 %                       15%                       5%
8. Process when a tree is felled and new shoots come from the stump is called:  
 Pollarding                       Coppicing                       Thinning                       Pruning
9. Which of the following plant species should never be used for bioengineering?  
 *Tectona grandis*                       *Alnus nepalensis*  
 *Pinus wallichiana*                       *Schima wallichii*
10. Choice of the plants species for bio-engineering should give first priority to:  
 Availability                       Benefit to local farmers  
 Specific problems in site                       Ecological conditions

SECTION "B"  
[10 Q. × 1 = 10 marks]

Fill in the blanks with appropriate word/words.

11. During assessing the site, site moisture is recorded in ..... classes.
12. Vertical grass lines allow a slope to develop a ....., reducing infiltration and the likelihood of liquefaction of the soil.
13. Broadcasting of seeds can be carried out on any slopes up to 45 degrees but less successful on slopes steeper than ..... degrees.
14. Alternatively, fascine technique is also named as .....
15. *Simali*, a local shrub species in mid hills of Nepal is frequently used in Bioengineering work. The botanical name of the species is.....
16. On very steep cut slopes, ..... are used to support blocks of harder rock where they are underlain by softer rock bands.
17. Weeding is ..... maintenance type is bioengineering.
18. Appropriate size of bioengineering nursery depends on the number of plants to be produced, time these plants to be kept in the nursery and ..... at which they will stand in the beds.
19. A special type of rock failure, found in massive or sparsely-jointed permeable, weatherable rocks is called.....
20. Cloches helps increasing .....of vegetation in higher altitude.

SECTION "C"  
[5 Q. × 1 = 5 marks]

Define the following in one sentence.

21. Anchor function:
22. Slope segment:
23. Turf:
24. Piping:
25. Sheet erosion:

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F. M. : 55

SECTION "D"

[3 Q. × 7 = 21 marks]

Attempt *ANY THREE* questions.

1. Briefly highlight four phases involved in the process of stabilization of slopes. [7]
2. What is contour grass plantation? Explain construction steps required for this plantation type. [3 + 4]
3. What is bio-engineering nursery? List down each component of it with necessary sketches. [2 + 5]
4. How an appropriate plant species is selected in Bioengineering? Explain in detail. [7]

SECTION "E"

5. Differentiate between *ANY FOUR* [4Q. × 4 = 16]
  - a. Permanent and expendable nursery equipment.
  - b. Random planting and hydro seeding.
  - c. Causes and mechanisms of slope failure.
  - d. Wire rock bolster and fascines.
  - e. Local species and exotic species in bio-engineering.
6. Justify the following statements [4Q. × 3 = 12]
  - a. Vegetation requiring low maintenance is preferred in bio-engineering.
  - b. Bioengineering offers new set of tools for slope stabilization but does not replace the use of civil engineering structures.
  - c. Grass seeding is often used in conjunction with mulching and jute netting.
  - d. Beds in bioengineering nursery are constructed along an east-west lines if possible.
7. Write short notes on. [2Q. × 3 = 6]
  - a. Soil nailing
  - b. Retards

