Marks scored:

KATHMANDU UNIVERSITY
End Semester Examination
August/September, 2017

AUG 23 2017

Level : B.Sc.
Year : II
Course : ENVS 224
Semester: II

Exam Roll No. :
Time: 30 mins.
F. M. : 20

Registration No.:
Date :

SECTION "A"
[20 Q. × 0.5 = 10 marks]

Choose and mark "X" in the most appropriate answer box:

1. The study of soil in relationship to agriculture or soil as a habitat for plants:
[ ] Pedology [ ] Edaphology [ ] Pelology [ ] Agrology

2. In mineral soils, the composition of organic matter (by volume) ranges up to:
[ ] 10% [ ] 25% [ ] 35% [ ] 50%

3. Formation of soil takes place most rapidly in the climate:
[ ] Boreal [ ] Temperate [ ] Semi-arid [ ] Tropical

4. Soil layer different among the following :
[ ] Top soil [ ] Plow layer [ ] Furrow slice [ ] Subsoil

5. The first records (4000 years ago) of using soil maps as a criterion for land taxation was in:
[ ] England [ ] India [ ] China [ ] Africa

6. Means of observation of clay particles is :
[ ] Electron microscope [ ] Compound microscope
[ ] Simple microscope [ ] Naked eye

7. Movement of water downwards through the surface of the soil is known as:
[ ] Percolation [ ] Diffusion [ ] Runoff [ ] Infiltration

8. The number of soluble inorganic compounds in soil which are essential for plant growth:
[ ] 8 [ ] 18 [ ] 43 [ ] 105

9. Sand, Silt and Clay are the soil physical properties described under :
[ ] Colour [ ] Texture [ ] Minerals [ ] Density

10. Munsell colour chart do not consider _____for soil classification and interpretation.
[ ] Hue [ ] Chroma [ ] Value [ ] Horizons

11. According to USDA soil textural triangle, soil with 40% of silt, 20% of clay and 40% of sand is:
[ ] Clay loam [ ] b Sandy loam [ ] Loam [ ] Silt loam

12. Soil water potential is expressed in bars or MPa. The general value of soil water potential in MPa is:
[ ] Less than zero [ ] Zero [ ] One [ ] Higher than one

[ ] Hexagonal crystal [ ] Irregular flakes
[ ] Crystaline [ ] Non-crystaline

14. Among the following the amount (mg/kg) of micronutrient of this element and its forms is highest in soil:
[ ] Mn [ ] Fe [ ] Cu [ ] Zn

15. The highest level of soil erosion from arable land is due to:
[ ] Water [ ] Air [ ] Snow [ ] Gravity

16. Eroded area of a meter width and depth is termed as:
[ ] Splash erosion [ ] Sheet erosion [ ] Rill erosion [ ] Gully erosion

17. Soil porosity is increased by:
[ ] Compaction [ ] Excessive tillage [ ] Puddling [ ] Plant roots

18. The main factor responsible for the unique properties of the water molecule is:
[ ] Size [ ] Shape [ ] Polarity [ ] Composition

19. In the USDA soil taxonomy system there are 12 soil:
[ ] Orders [ ] Groups [ ] Families [ ]Series

20. Chemical compound which is NOT the forms of agricultural lime:
[ ] $CaCO_3$ [ ] $CaCl_2$ [ ] CaO [ ] $CaMg(CO_3)_2$

SECTION "B"
[20 Q. × 0.5 = 10 marks]

Fill in the blanks with most appropriate answer/s:

21. Soils occur on terrestrial landscapes are influenced by the location and _____

22. The water holding capacity and it availability to plants is determined by soil texture, _____, porosity and bulk density.

23. Vertical section of the upper, weathered part of the land surface down to the bed rock and is the basis for distinguishing different soil types_____

24. Soils having high organic matter, formed in swamps, bogs or marshes and very productive _____

25. The rate of soil formation is also influenced by climate but climate that have little to no soil formation _____

26. Soil taxonomy is unique classification system of soil where major two criteria i.e., soil properties and _____ are used.

27. Oxisolare most highly weathered soils with high Fe/Al oxides where as highly weathered, reddish brown-yellow acidic soils are termed as _____

28. _____ is a measurement of how tightly packed or dense the soil is, which is determined by measuring the weight of dry soil in a unit of volume (g/cm3).

29. There are three kinds of water movement in soils i.e., Saturated flow, Unsaturated flow, and _____

30. "An acid is a proton donor and base is a proton acceptor", this definition is given by _____

31. Clay colloids consist of alternating layers of silica tetrahedra and _____ sheets arranged in 1:1, 2:1, or 2:2 (Mg-silicates) basic units.

32. Most readily available form of Nitrogen for plants is _____

33. Cultivated (agricultural) soils usually contain about_____% of organic matter by weight.

34. It is a process where ammonia compounds are tied in the bodies of soil organisms _____

35. A common soil order found in the Nepal mid-hills is _____

36. The term applied to compounds formed from binding or complexing of certain metallic cations with organic molecules or anions readily available for plants _____

37. Rolling and sliding of larger soil particles along soil surface due to wind force and saltation is called as _____

38. "Better management of crops, pastures, forests and soil so as to retain more water for increased production and maintained stream flow" is the main objective of _____

39. Ranking of land according to its specific use or recommending land uses for particular land types is _____

40. Bulk density may be determined by _____ method or by the core method.

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SECTION "B"

(Long answer questions)
[3Q × 7 = 21 marks]

Answer *ANY THREE* of the following questions:

1. What are the five main roles of soil in an ecosystem? Explain how these roles are linked in the system?

2. Discuss the physical and chemical properties of soil.

3. What are the major soils found in Nepal? Describe their occurrences.

4. List the essential soil nutrients for plants. Write the roles of these nutrients in agricultural productivity and soil quality.

SECTION "C"

Answer *ALL* of the following questions:

5. Write short notes on (*ANY FIVE*) [5Q × 4= 20]
   a. Soil horizons
   b. Land and soil management
   c. Soil organic matter
   d. Land use planning
   e. Infiltration rate
   f. Soil erosion

6. Distinguish between [3Q × 3 = 9]
   a. Land degradation and rehabilitation
   b. Soil flora and soil fauna
   c. Forest and grassland soil

7. Calculate the bulk density of a soil core of 180 cm^3 if it has a moist weight of 260 g and gravimetric soil water content of 15%. [1Q × 5 = 5]