



DF-3045

**B. Sc. (Sem. III) (Environment Science) Examination**  
**March / April - 2016**  
**302 : Soil Sciences**

Time : 2 Hours]

[Total Marks : 50

સૂચના/Instructions :

(1)

નીચે દર્શાવેલ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી. Fillup strictly the details of signs on your answer book.	Seat No. :
Name of the Examination :	<input type="text"/>
<input type="text" value="B. SC. (SEM. III) (ENVIRONMENT SCIENCE)"/>	<input type="text"/>
Name of the Subject :	<input type="text"/>
<input type="text" value="302 : SOIL SCIENCES"/>	<input type="text"/>
Subject Code No. : <input type="text" value="3"/> <input type="text" value="0"/> <input type="text" value="4"/> <input type="text" value="5"/>	<input type="text"/>
Section No. (1, 2,.....): <input type="text" value="Nil"/>	<input type="text"/>
	Student's Signature

- (2) પ્રશ્નપત્રમાં કુલ ૫૦ પ્રશ્નો છે, બધા જ ફરજિયાત છે. દરેક પ્રશ્નનો (૧) એક ગુણ છે.  
There are 50 questions and each question carries one (1) mark and all are compulsory.
- (3) દરેક પ્રશ્નનો કાળજીપૂર્વક અભ્યાસ કરી સાચો વિકલ્પ પસંદ કરો.  
Read the question carefully before selecting the correct option.

***O.M.R. Sheet ભરવા અંગેની અગત્યની સૂચનાઓ આપેલ  
O.M.R. Sheet-ની પાછળ છાપેલ છે.  
Important instructions to fillup O.M.R. Sheet  
is given on back side of the provided O.M.R. Sheet.***

- 1 Heterotrophic animals facilitates activity and diversity of \_\_\_\_\_.
  - (A) Plants
  - (b) Bacteria and Fungi
  - (C) Other carnivorous
  - (D) Rodents and human
  
- 2 Microbial flora works as a \_\_\_\_\_ in Macro and Microecosystem.
  - (A) Link
  - (B) Barrier
  - (C) Both
  - (D) None of the these
  
- 3 Description and exploration of Microarthropods among total microbial diversity available is :
  - (A) 10%
  - (B) 15%
  - (C) 30%
  - (D) 50%
  
- 4 Connections among species biodiversity show :
  - (A) Ecosystem functioning and Processes
  - (B) Community development
  - (C) Pollution dynamics
  - (D) All of these
  
- 5 Research focuses in soil ecosystem on :
  - (A) Computer knowledge with soil texture
  - (B) Soil awareness with pollution
  - (C) Soil composition and Function
  - (D) Cooperation of multiple disciplines and lumping of animals into functional group
  
- 6 Soil microflora playa role in ecosystem by :
  - (A) Degradation and Decomposition
  - (B) Magnification
  - (C) Increase population
  - (D) Process of metabolism
  
- 7 Following are temporary soil residents :
  - (A) Actinomycetes, Fungi
  - (B) Earthworms, Amoebae
  - (C) Cutworms, Dipterans
  - (D) Mosquitoes, Tick

- 8 Following are the Permanent resident of Ecosystem :
- (A) Velvet mites
  - (B) Gnats
  - (C) Cutworms
  - (D) Collembolans
- 9 Periodic residents of Soil Ecosystem are :
- (A) Gnats
  - (B) Velvet Mites
  - (C) Cutworms
  - (D) Collembolans
- 10 According to size soil fauna is classified as :
- (A) Bacilli, Cocci, Spirochetes, Coccobacilli
  - (B) Micro, Meso, Macro, Mega
  - (C) Bacteria, Fungi, Actinomycetes, Virus
  - (D) Big, Small, Large, Round.
- 11 Microfauna has size :
- (A) 1 - 2 cm
  - (B) 0.1 – 0.2 inches
  - (C) 1 – 100 cm
  - (D) 1 – 100 m
- 12 The ability to create own species through burrowing activity :
- (A) Megafauna
  - (B) Macrofauna
  - (C) Mesofauna
  - (D) Microfauna
- 13 Who inhibit water films ?
- (A) Megafauna
  - (B) Macrofauna
  - (C) Mesofauna
  - (D) Microfauna
- 14 Microbial biomass is measured to determine :
- (A) Microbiota to management
  - (B) Environmental change
  - (C) Site disturbance and soil pollution
  - (D) All the these

- 15 What is the role of nonfumigated soil during CFI ?
- (A) Test
  - (B) Blanket
  - (C) Control
  - (D) Nothing
- 16 Application of CFE is for :
- (A) Quantification of microbial constituents
  - (B) Structural analysis of soil
  - (C) Chemical composition and management
  - (D) Soil pollution and disturbance
- 17 Which method can be used for all type of soils ?
- (A) CFI
  - (B) CFE
  - (C) CIF
  - (D) CEF
- 18 The abbreviation SIR stands for :
- (A) Sequential Induced Reactions
  - (B) Substrate Induced Respiration
  - (C) Substrate Induced Reactions
  - (D) Sequential Induced Respiration
- 19 Significance of SIR method :
- (A) Estimate carbon in all heterotropic mass
  - (B) Measuring respiration by adding substrate
  - (C) To measure relative biomass of soil microbial community
  - (D) all of these
- 20 Isotopic composition of CFI methods is :
- (A)  $^{32}\text{C}$ ,  $^{35}\text{C}$ ,  $^{15}\text{C}$
  - (B)  $^{14}\text{C}$ ,  $^{13}\text{C}$ ,  $^{15}\text{C}$
  - (C)  $^{15}\text{N}$ ,  $^{32}\text{P}$ ,  $^{35}\text{S}$
  - (D)  $^{15}\text{C}$ ,  $^{32}\text{P}$ ,  $^{35}\text{S}$

- 21 Isotopes used in CFE methods is :  
 (A)  $^{14}\text{C}$ ,  $^{13}\text{C}$ ,  $^{15}\text{N}$ ,  $^{32}\text{P}$ ,  $^{35}\text{S}$  (B)  $^{14}\text{C}$ ,  $^{13}\text{C}$ ,  $^{15}\text{C}$ ,  
 (C)  $^{15}\text{N}$ ,  $^{32}\text{P}$ ,  $^{35}\text{S}$ ,  $^{32}\text{C}$  (D)  $^{15}\text{C}$ ,  $^{32}\text{P}$ ,  $^{35}\text{S}$ ,  $^{14}\text{C}$
- 22 Isotopes labeled analysis require instrument like :  
 (A) UV spectrometer  
 (B) Fluroscent microscope  
 (C) Isotope ratio mass spectrometer  
 (D) Infrared mass spectrometer
- 23 Lucifer Enzyme require cofactor to activate :  
 (A)  $\text{Ca}^{+2}$  (B)  $\text{Mg}^{+2}$   
 (C)  $\text{Cl}^{-}$  (D)  $\text{OH}^{-}$
- 24 Application of scintillation counter is :  
 (A) To measure nucleic acid  
 (B) To measure ATP content  
 (C) To measure isotopes  
 (D) To measure organic matter
- 25 What is the role of landscape scale analysis ?  
 (A) Soil composition and population relationship  
 (B) Tools to identify and explain spatial relationship between physico -  
 chemical properties  
 (C) Tools to identify Microbial population and its biomass  
 (D) Tool to measure population dynamics
- 26 The buffer reaction occur in soil due to :  
 (A) Soil erosion  
 (B) Plant nutrient absorlation  
 (C) Soil microbiota  
 (D) Decrease in soil biota
- 27 Soil nutrients are utilized by plants as a reaction of :  
 (A) Ion exchange (B) Mineralization  
 (C) Immobilization (D) All of these
- 28 Microbial activity of soil depends on :  
 (A) Ratio of C:N  
 (B) Adequate energy supply from OH  
 (C) Soil fertilization  
 (D) Concentration of chemicals
- 29 Cation and Anion exchange in soil occurs between :  
 (A) Clay minerals, inorganic compound and Plant roots  
 (B) Chemical compounds present in soil  
 (C) Microbiota of soil, soil particles and water  
 (D) Water, Chemical bonds, soil particles
- 30 Cation exchange in soil comprises of \_\_\_\_\_ volume.  
 (A) 10% (B) 30%  
 (C) 50% (D) 100%

- 31 The solid portion in soil comprises of :  
 (A) Inorganic minerals and OM  
 (B) Salts and water  
 (C) Soil particles and water  
 (D) WHC and FC
- 32 Primary elements present in clay fraction are :  
 (A) Nitrates and Nitrites  
 (B)  $\text{CaCO}_3$  and  $\text{MgCO}_3$   
 (C) Silicatetrahedra and aluminiumoctahedra  
 (D) Salts and miner
- 33 CEC abbreviation stands for :  
 (A) Cobalt Electron Compound  
 (B) Chemicals Exchange Capacity  
 (C) Cation Exchangable Chemicals  
 (D) Cation Exchange Capacity
- 34 AEC abbreviation stands for :  
 (A) Atomic Exchange Chemicals  
 (B) Anion Exchange Capacity  
 (C) Air Exchangaable Chemicals  
 (D) Anion Exchange Chemicals
- 35 Microbe—Plant interactions are known as:  
 (A) Epiphytes (B) Epiphytes and Endophytes both  
 (C) Endophytes (D) none of the these
- 36 During photosynthesis, carbon is :  
 (A) released from wood as carbon dioxide when wood is burned  
 (B) broken down and released from the remains of living organism  
 (C) converted by organisms from a gas to carbohydrates  
 (D) released by organisms as carbon dioxide
- 37 Plants capture and transfer solar energy in a process called :  
 (A) Oikos. (B) Ecology.  
 (C) Transpiration. (D) Photosynthesis
- 38 Carbon is stored as a type of rock called carbonate in the :  
 (A) biosphere. (B) Atmosphere.  
 (C) hydrosphere. (D) Geosphere.
- 39 Which of these could increase average global temperatures ?  
 (A) Increased use of fossil fuels  
 (B) Increased ocean algal blooms  
 (C) Decreased carbon dioxide emissions  
 (D) Increased number of animal species
- 40 Permanent deforestation can contribute to potential global warming by :  
 (A) Decreasing atmospheric  $\text{CO}_2$  levels.  
 (B) Increasing atmospheric  $\text{CO}_2$  levels.  
 (C) Decreasing atmospheric  $\text{N}_2$  levels.  
 (D) increasing atmospheric  $\text{N}_2$  levels.

- 41 Carbon in the atmosphere is most often found as :
- (A) stratospheric ozone
  - (B) fossil fuel
  - (C) carbon monoxide
  - (D) carbon dioxide
- 42 The heating of the lower layer of the atmosphere from radiation absorbed by certain heat-absorbing gases is called :
- (A) The adiabatic effect
  - (B) The greenhouse effect
  - (C) The photosynthesis effect
  - (D) Smog
- 43 What is the purpose of a carbon sink ?
- (A) Absorb CO<sub>2</sub> from the atmosphere
  - (B) Create deposits for fossil fuels
  - (C) Keep CO<sub>2</sub> from accumulating at rapid rate in the atmosphere
  - (D) Both Create deposits for fossil fuels and Keep CO<sub>2</sub> from accumulating at rapid rate in the atmosphere
- 44 Energy flow depends on :
- (A) Degradation rate
  - (B) Consumers decompose the substrate
  - (C) Consumers absorb solar energy
  - (D) Origin of energy
- 45 Which of the following is contributing to an overload of the carbon cycle?
- (A) Photosynthesis
  - (B) Cellular respiration
  - (C) Deforestation
  - (D) All of these

- 46 Nitrogen that is used by plants is in the form of...
- (A) Nitrogen monoxides
  - (B) Nitrates
  - (C) Ammonia
  - (D) Dinitrosomonas
- 47 What do plants do with the nitrogen they absorb ?
- (A) Kill other plants
  - (B) Use in photosynthesis
  - (C) For protein syntheses
  - (D) For nitrogen adsorption
- 48 The conversion of nitrogen gas to nitrates by bacteria. is called;
- (A) Nitrification
  - (B) Denitrification
  - (C) Ammonification
  - (D) Nitrogen fixation
- 49 When is ammonia released ?
- (A) During the break down of dead animals by fungi and bacteria.
  - (B) When the animals fart
  - (C) Dougs hair
  - (D) Burning of plant material
- 50 What is the function of nitrifying bacteria ?
- (A) The conversion of nitrates into ammonia.
  - (B) The conversion of ammonia into nitrates.
  - (C) The conversion of nitrates into nitrogen monoxide
  - (D) All of these