

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

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

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

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

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

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

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