2015

MICROBIOLOGY

[Honours]

PAPER – III

Full Marks : 90

Time : 4 hours

The figures in the right hand margin indicate marks

Candidates are required to give their answers in their own words as far as practicable

Illustrate the answers wherever necessary

GROUP – A

Answer any **two** questions : 15 × 2

1. (*a*) What is humus ? How does it form ? 2 + 2

(*b*) Why soil is considered an ideal habitat for microbial growth ? 3

(*c*) Why rhizosphere microorganisms are often found to be characteristically different from phylosphere microorganisms ? 3

(*d*) What is rhizosphere effect ? 3

(*e*) What is biomining ? 2

2. (*a*) What is associative nitrogen fixation ? Give on such example. 2 + 1

(*b*) Briefly describe the biochemistry of nitrogen fixation with special reference to the enzyme nitrogenase. 3

(*c*) Differentiate between an ecto and endo micorhizae. 3

(*d*) How soil phosphatase activity is measured ? What is the importance of phosphatase activity in soil ? 3 + 3

3. (*a*) Differentiate between mean deviation and standard deviation. 2

(*b*) What is correlation coefficient ? 2

(*c*) What is standard error of mean ? 2

(*d*) A drug given to each of the 12 persons resulted in the following changes in the blood sugar level from normal : (120 mg/dl)

−3, 2, 8, −1, 3, 0, 7, −2, 1, 5, 0, 4

Calculate by Student's "*t*" test whether these changes are significant or not. (Given that at d.f. = 11, at 5% level of significance, table value of *t* is 2·20). 4

(*e*) What is a pen drive ? How does it differ from a compact disc ? 1 + 1

(*f*) Define the following terms : 1 + 1 + 1

(*i*) WWW

(*ii*) WAN

(*iii*) wi-fi.

GROUP – B

Answer any **five** questions : 8 × 5

4. (*a*) What is bioaerosol ? Name two contagious diseases that transmitted through air. 2 + 2

(*b*) What is sym plasmid ? 2

(*c*) State the benefits of biofertilizers over chemical fertilizers. 2

5. (*a*) Describe briefly about the microbial activities required for compost formation. 4

(*b*) What is synergism ? How does it differ from mutualism ? Explain with suitable example of each. 2 + 2

6. (*a*) How can you enumerate the number of organisms present in the air of a particular place ? 3

(*b*) What is a barophilic organism ? Give one example. 1 + 1

(*c*) What is EMB and MPN test ? 3

7. Write short notes on : 2 × 4

(*i*) Oxidation pond

(*ii*) Trickling filter

(*iii*) Septic tank

(*iv*) Tertiary treatment.

(*Continued*)

8. (*a*) Write down the name of the respective plant diseases caused by the following organisms and mention major symptoms of the disease : 1 + 1 + 2 + 2

(*i*) *Xanthomonas oryzae*

(*ii*) *Erwinia amylovora.*

(*b*) Write down the role of microorganisms in ammonification. 2

9. (*a*) What is coefficient of variance ? 2

(*b*) A set of measurements has a mean of 80. A constant value 10 is added to each measurement. What is the mean of the resulting measurement ? 3

(*c*) What are the importance of sampling in biostatistics ? 3

10. (*a*) What are the functions of computer motherboard and processor ? 2

(*b*) What are BIT and Byte ? 2

(*c*) What is BLAST search in bioinformatics ? 2

(*d*) What are RDB and PDB ? 2

GROUP – C

Answer any **five** questions : 4 × 5

11. What is eutrophication ? What does it indicate about quality of a water sample ? 2 + 2

12. What is vermicomposting ? Mention its benefits. 2 + 2

13. (*a*) How will you experimentally isolate a nitrogen fixing microorganism from soil ? 2

(*b*) State briefly the role of dinitrogenase reductase in nitrogen fixation by a nitrogen fixing organism. 2

14. What is bioremediation ? Mention two major benefits of this process with proper example of each. 2 + 2

15. What are IMViC tests ? State its purposes. 2 + 2

16. What are positive and negative corelations ? Give example of each. 2 + 2

17. (*a*) Is JAVA a high level language ? Why or why not ? 2

(*b*) What is meant by generations of computer ? 2