

CS/B.Sc. (H), Micro-Bio./SEM-6/FAM-603/2012

2012

FOOD AND AGRICULTURAL MICROBIOLOGY

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words

as far as practicable.

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following : 10 × 1 = 10
- i) Commensalism refers to the relationship of two organisms
 - a) that live side by side, but have absolutely no effect on each other
 - b) where one benefits at the expense of the other
 - c) that is mutually beneficial
 - d) none of these.
 - ii) Function of agriculture soil is
 - a) anchor plant roots
 - b) supply water to plant roots
 - c) furnish nutrients for plant growth
 - d) all of these.
 - iii) Causative microbes in fresh fruits and vegetables are
 - a) Penicillium b) Pseudomonas
 - c) Bacillus d) Rhizopus.
 - iv) In organic matter decomposition of bacteria is involved as

- a) population increases rapidly
 - b) quickly degrade simple compounds — sugars, proteins, amino acids
 - c) have a harder time degrading cellulose, lignin, starch
 - d) all of these.
- v) When organic matter is added to soil fungi
- a) able to degrade complex organic molecules such as cellulose, lignin, starch
 - b) give other soil micro-organisms access to simpler molecules that were protected by cellulose or lignin
 - c) grow more slowly and efficiently than bacteria
 - d) all of these.
- vi) Predators
- a) feed on the primary decomposers (bacteria, fungi, actinomycetes)
 - b) release nutrients (nitrogen) contained in the bodies of the primary decomposers
 - c) are protists and nematodes
 - d) all of these.
- vii) Which of the following is *not* an intrinsic factor in food spoilage ?
- a) pH b) Moisture
 - c) Temperature d) Nutrient content.
- viii) Compound responsible for the distinctive “earthy” odour of soil is
- a) Phytoalexins b) Root exudates
 - c) Cellulose d) Geosmin.

ix) Dissimilatory sulphur-reducing bacteria

a) can reduce elemental sulphur to sulphide but are unable to reduce sulphate to sulphide

b) cannot reduce elemental sulphur to sulphide but can reduce sulphate to sulphide

c) can reduce both elemental sulphur and sulphate to sulphide

d) cannot reduce both elemental sulphur and sulphate.

x) Bacteria of both the physiological groups, ammonia oxidizers and nitrite oxidizers are

a) gram negative chemolithotrophs

b) both gram positive and gram negative chemolithotrophs

c) gram negative chemo-organotrophs

d) both gram negative and gram positive chemoorganotrophs.

xi) Leghemoglobin is

a) a type of hemoglobin responsible for carrying oxygen to tissues

b) red, iron containing protein, which has role in Nitrogen fixation

c) hemoglobin with sickle shape

d) hemoglobin responsible for phosphate solubilization.

xii) Nitrate and phosphate contamination of aquatic ecosystem causes

a) algal bloom

b) accelerated eutrophication

- c) suffocation of aquatic aerobes
- d) all of these.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. Write short notes on any *one* of the following :
 - a) Leaf blight of potato
 - b) Mycotoxicoses
 - c) Parasitism
 - d) Soil anaerobic methanogens in rice fields.
3. What is the chemical nature of milk ? What are the sources of microbial contamination of milk ? $2 + 3$
4. What is kinema ? How could you prevent canned food spoilage ? Name some microbes causing canned food spoilage. $1 + 2 + 2$
5. Support the significance of *D* value and *Z* value with proper graphical representation.
6. Describe the steps for mass production of bacterial biofertilizers with examples.

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. a) What is food poisoning ? What do you know about *E.coli* poisoning ? $3 + 4$
- b) What do you mean by food spoilage ? What are the causes of spoilage of meat, fish and vegetables ? $2 + 6$
8. a) What do you know about food preservation ? What are the roles of salts and organic acids in food

preservation ? 2 + 6

b) What is the role of photosynthetic and nitrosifying

bacteria in nitrogen fixation ? 3 + 4

9. Give the flow chart of cheese production. What is food spoilage and what are the main types of food spoilage ? Name a starter culture of yoghurt production. How is yoghurt prepared ? 5 + 4 + 1 + 5

10. What is pasteurization ? Describe the types and the process. What is the test by which one can measure the efficiency of pasteurization ? Name some fermented milk products.

2 + 5 + 5 + 3

11. What are entomopathogenic fungi ? Scientists have succeeded in introducing toxin gene of *Bacillus thuringiensis* into plants like cotton. What purpose is achieved through this action ? What is the source of this toxin ? Why crystals of Bt do not kill the bacteria itself ? How do they kill insects ? What are the types of biofertilizers ? 2 + 3 + 1 + 3 + 3 + 3

=====