2014

BOTANY

(Major)

Paper : 5.1

(Microbiology and Immunology)

Full Marks : 60

Time : 3 hours

The figures in the margin indicate full marks for the questions

1. Answer the following as directed : 1×7=7

(a) Which ribosomal RNA is extensively used for microbial taxonomy?

(b) Bacterial growth is synonymous to ——.

(Fill in the blank)

(c) Name the microbiologist who crystalized tobacco mosaic virus for the first time.

(d) —— plasmid is used for biological gene transfer in genetic engineering.

(Fill in the blank)

(e) Give an example of magnetotactic bacteria.

(f) Which type of antibody is present in mother's milk?

(g) Which of the following organisms is termed as 'energy parasite'?

(i) Mycoplasma

(ii) Rickettsiae

(iii) Chlamydiae

(iv) Z-form bacteria

2. Define the following giving suitable examples : 2×4=8

(a) Archaebacteria

(b) Prions

(c) Actinomycetes

(d) Interferons

3. Answer any *three* of the following questions : 5×3=15

(a) What are plasmids? Describe the role of different types of plasmid.

(b) Define germ theory of disease. In what way did Koch's postulates influence the development of microbiology?

(c) Describe the molecular trends for bacterial taxonomy.

(d) Write a note on aerobiology.

4. Answer the following questions : 10×3=30

(a) Discuss the role played by micro-organisms in maintaining the carbon cycle in nature.

Or

What is generation time? Draw a typical bacterial growth curve and describe the events take place in each phase.

(b) Discuss the various views with regard to the nature of viruses. Describe the recent outlines of viral classification.

Or

"Transduction is a vector mediate para-sexuality." Explain the statement. Describe the process of generalized and specialized transduction in bacteria.

(c) Define specific resistance. Describe in detail the clonal selection theory for mechanism of antibody formation.

Or

What is potable water? How is potability of water determined?

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2014

BOTANY

(Major)

Paper : 5.2

(Plant Pathology and Lichen)

Full Marks : 60

Time : 3 hours

The figures in the margin indicate full marks for the questions

1. Answer the following questions : 1×7=7

   (a) Name one ancient Indian holy book in which reference to plant diseases and their control devices are made.

   (b) Who is regarded as the 'Founder of Mycology and Plant Pathology' in India?

   (c) Which crop plant disease is directly related to the famous famine occurred in Ireland between 1845 and 1847?

   (d) What is chlorosis?

(e) What is the causal organism of canker disease of citrus plants?

(f) Name one fungal species that used as biocontrol agent.

(g) What are soredia?

2. Answer the following questions : 2×4=8

(a) What is the causal organism of powdery mildew of pea?

(b) Differentiate between primary inoculum and secondary inoculum.

(c) How are root-cap border cells related to the infection in soil-borne diseases?

(d) What are the shot holes in necrotic symptoms?

3. Write short notes on any *three* of the following : 5×3=15

(a) Penetration of pathogens to host

(b) Host-specific toxins

(c) Soil nutrients and disease development

(d) Quarantines

(e) Integrated Disease Management (IDM)

4. Give an account of symptoms, causal organism, etiology and control of late blight of potato. 2+2+2+4=10

Or

What are the rust diseases reported from India? Discuss the symptoms, etiology and control of black rust disease of wheat. 3+2+2½+2½=10

5. Give an account of cultural and biological methods of plant disease control. 10

Or

Write notes on the following : 5×2=10

(a) Gray blight of tea

(b) Tobacco Mosaic Virus (TMV)

6. Give an account of ecological and economic importance of the Lichens. 10

Or

Give an illustrated account of methods of reproduction met in Lichens.

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Or

Describe with suitable examples, the role of allopolyploidy in improvement of crops.

(b) Describe the role of heterosis in crop improvement. 10

Or

Describe various methods of selection used in plant breeding. What is its importance?

(c) Discuss the modifications in dihybrid ratio (9:3:3:1) due to different kinds of interactions of genes. Can you explain these modifications on the basis of Mendel's law of inheritance? 10

Or

What do you understand by recombination? Discuss various views available to explain the mechanism of recombination.

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2014

BOTANY

(Major)

Paper : 5.3

(Cytogenetics, Plant Breeding and Biometrics)

Full Marks : 60

Time : 3 hours

The figures in the margin indicate full marks for the questions

1. Choose and write the correct one/Fill in the blanks : 1×7=7

(a) In case of dihybrid, the test-cross produces F_2 progeny in —— ratio.

(i) 1:1

(ii) 1:1:1:1

(iii) 1:2:1

(iv) 9:3:3:1

(b) In interaction of genes, the ratio obtained as 9:7 in F_2 generation refers to

(i) complementary genes

(ii) supplementary genes

(iii) epistasis

(iv) lethal genes

(c) In which stage of meiosis-I, crossing-over takes place?

(i) Leptotene

(ii) Zygotene

(iii) Pachytene

(iv) Diplotene

(d) Cytoplasmic inheritance is also known as

(i) maternal inheritance

(ii) extranuclear inheritance

(iii) Both (i) and (ii)

(iv) None of the above

(e) Which of the following is considered as frame shift mutation?

(i) Deletion

(ii) Transition

(iii) Transversion

(iv) Substitution

(f) Variations in the number of entire set of chromosome is known as ——.

(g) A monosomic plant contains —— number of chromosomes in its cell.

2. Answer the following questions : 2×4=8

(a) Define analysis of variance (ANOVA).

(b) What is Hardy-Weinberg law?

(c) Write on the importance of heterosis in plant breeding.

(d) Write on the application of standard deviation in biology.

3. Answer any *three* of the following questions : 5×3=15

(a) Discuss briefly the cytological basis of crossing-over.

(b) What is genic-balance theory of sex determination? Explain.

(c) Briefly discuss the different types of male sterility in plants.

(d) Write on the evolutionary significance of polyploidy.

4. (a) Describe the different methods, which have been used for the production of monosomics. What method in your opinion is the best? 10

(c) Write notes on the following : 5+5=10

(i) Indoor gardening

(ii) Mycotoxins

Or

Write notes on the following : 5+5=10

(i) Algae as medicine

(ii) Bioremediation

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2014

BOTANY

(Major)

Paper : 5.4

(Applied Botany)

Full Marks : 60

Time : 3 hours

The figures in the margin indicate full marks for the questions

1. Answer the following as directed : 1×7=7

(a) Name two nitrogen fixing blue-green algae.

(b) Name the algae from which 'algin' is produced.

(c) Brown spot of rice is caused by ——.

(Fill in the blank)

(d) Which one of the following microbes can degrade pesticide?

(i) *Aspergillus flavus*

(ii) *Bacillus papilliae*

(iii) *Salmonella typhi*

(iv) *Bacillus natto*

(Pick up the correct one)

(e) The production of pure lines in cross-pollinated plants is known as ——.

(Fill in the blank)

(f) Genetic engineering is also known as —— —— ——.

(Fill in the blanks)

(g) Cytokinin is a/an

(i) natural plant hormone

(ii) artificial plant hormone

(iii) postulated plant hormone

(iv) non-nitrogenous plant hormone

(Pick up the correct one)

2. Write short notes on the following : 2×4=8

(a) Irradiation breeding

(b) Biological weathering

(c) Dairy bacteriology

(d) Agar-agar

3. Write explanatory notes on any *three* of the following : 5×3=15

(a) Grafting

(b) Intergeneric hybrids

(c) Use of microbes in bakery industry

(d) Parthenocarpic fruits

(e) Deforestation

4. Answer the following :

(a) Write an account on the role of hormones in agriculture and horticulture. 10

Or

Write an account on the role of microbes in increasing the fertility of soil.

(b) What is mutation? Mention the role of mutation in crop improvement. 2+8=10

Or

What is mycorrhiza? Discuss its role in plant growth and development. 2+8=10