

2012

M.Sc.

Part-I Examination

BOTANY

PAPER—I

Full Marks : 100

Time : 4 Hours

The figures in the margin indicate full marks.

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

Illustrate the answers wherever necessary.

Write the answer to questions of each Half in separate books.

First Half

[Marks : 50]

(Microbiology)

Answer Q. No. 1 and any three questions from the rest.

1. Write short answers of (any ten) the following : 2×10
 - (i) Define plasmid and episome.
 - (ii) Name two unique chemical features of the cell walls of archaebacteria.

(Turn Over)

- (iii) Where are teichoic acids present in the cell wall of bacteria? Mention its function.
 - (iv) Distinguish between protoplasts and sphaeroplasts.
 - (v) How the nitrogen fixing bacteria is screened from soil?
 - (vi) Name the bacteria responsible for causing tetanus and meningitis.
 - (vii) State the contributions of
 - (a) Robert Koch
 - (b) Louis Pasteur in the development of Microbiology.
 - (viii) Differentiate between antiseptics and disinfectants.
 - (ix) Why the moist heat is more effective than that of the dry heat for sterilization?
 - (x) What is prophage? Name one lysogenic phage.
 - (xi) State the difference between IgG and IgM.
 - (xii) Mention the functions of DNA helicase and gyrase?
 - (xiii) What are Hfr strains? How does Hfr differ from F⁺?
 - (xiv) What are recombinant-vector vaccines? Give examples.
 - (xv) What is the difference between oncogene and photo-oncogene?
2. (a) Briefly describe the process of endospore formation in bacteria. Why are the endospores resistant to extreme environmental conditions?
- (b) How would you develop a synchronous culture of bacteria?
- (c) What are carboxysomes? Mention their functions.
- 5+3+2

3. (a) What properties of antibiotics qualify them as chemotherapeutic agents? Describe the mode of antimicrobial action of penicillin.
- (b) How can plant viruses be cultivated?
- (c) Distinguish between viroids and prions.
- (2+3)+3+2
4. (a) Briefly describe an experiment to prove the spontaneous nature of bacterial mutation.
- (b) Classify chemical mutagens into specific types cite example of each.
- (c) Explain the effect of UV-radiations on bacterial cells.
- 4+3+3
5. (a) What is monoclonal antibody? Illustrate the technique of its production. Mention some applications of monoclonal antibody.
- (b) What is immunization? Distinguish between serum and antiserum.
- (1+5+2)+2
6. Write short notes on (any four) :
- $2\frac{1}{2} \times 4$
- (i) ED pathway;
 - (ii) Typical bacterial growth curve;
 - (iii) Specialized transduction;
 - (iv) Principle of Gram staining;
 - (v) Resolving power of microscope; and
 - (vi) Red wine.

Second Half

[Marks : 50]

**(Phycology, Mycology, Bryology, Pteridology,
Gymnosperms and Palaeobotany)**

7. Explain with suitable examples molecular biology is helpful in understanding phylogenetic relationship between the algal taxa? 10

Or

Write short notes on any two : 5×2

- Taxonomically significant ultrastructural features of algae ;
- Contrast between Cyanophyta and Prochlorophyta ;
- Role of different algal species in soil reclamation ;
- Diversity of pigments and storage food materials in algae.

8. Comment on the recent approaches for classifying fungi. Give an outline of the classification of fungi in the light of recent trend. 2+8

Or

Write short notes on any two : 5×2

- Salient features of Myxomycotina ;
- Contribution of fungi in modern medicine ;
- Parasexuality in fungi ; and
- Spore diversity in fungi.

9. Give an outline one classification of Bryophyta and mention the principles behind it. 10

Or

Write short notes on any two : 5×2

- Ecological significance of bryophytes ;
- Progressive sterilization of sporophytic tissue in bryophytes ;
- Characterize Bryales and mention its phylogenetic significance ; and
- Fossil bryophytes.

10. Mention the general characters of *ferus*. Briefly discuss the evolutionary trends in them. 4+6

Or

Write short notes on any two : 5×2

- Telome theory and its implication in the understanding of organogenesis of pteridophytes ;
- Primitive features of pteridophytes ;
- Diversity in soral types ; and
- Branching natures of the members of Trinurophytopsida.

11. Characterize cycadales and mention those characters which are contrasting with those of cycadofilicales. 6+4

Or

Write short notes on any two :

5×2

- (a) Indian Gondwana ;
 - (b) Fossilization processes ;
 - (c) Economic significance of coniferales ;
 - (d) Progymnosperms.
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