

2016

M.Sc.

4th Semester Examination

BOTANY

PAPER—BOT-402

Full Marks : 40

Time : 2 Hours

The figures in the right-hand margin indicate full marks.

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

Illustrate the answers wherever necessary.

Special Paper

(Advanced Plant Taxonomy)

Answer all questions.

1. Answer any *five* of the following : 5×2
- (a) Define taxonomic literature. Give an example of Flora.
 - (b) What does it mean by 'X' and *sp.nov.*? Give an example to each.

(Turn Over)

- (c) Define '*nomen nudum*' cite an example.
- (d) What is succulent halophyte ? Give an example.
- (e) Define DNA BAR CODING. Give an example.
- (f) Define ' α ' and ' β ' diversity.
- (g) Name two endemic species of angiosperms of India.
- (h) Who was the founder of ICBN and mention the year of establishment ?

2. Write the difference on any *two* of the following :

2×5

- (a) ICBN and ICN ;
- (b) Macromolecules and Micromolecules ;
- (c) Biodiversity and Megadiversity ; and
- (d) Holoparasites & Hemiparasites.

3. Answer any *two* of the following :

2×10

- (a) Define molecular systematics. Name the molecular attributes mainly used for molecular taxonomic study. Mention two important molecular attributes in solving taxonomic problems with the mentioning of their merits and demerits.

2+2+6

- (b) Define insectivorous plant. What is the basic difference between insectivorous & carnivorous plant? Name 6 common insectivorous plants with respective family and distribution. Discuss in details with example and suitable sketches the adaptive features of insectivorous plants. 1+1+3+5
- (c) Write the systematic position, characters and putative phylogenetic consideration of the subclass Caryophyllidae. Write six examples of this subclass which are economically and ethnomedicinally important. Define 'P' & 'S' type plastids. 6+3+1
- (d) Define phytogeography. Name the biogeographic zones of India. Define introduction, invasion and disjunction. 2+5+3
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(Ecology and Biodiversity)

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

1. Comment on the following (any *five*): 5×2
- (a) Deforestation ;
 - (b) Wetlands ;
 - (c) Biochemical Cycle ;
 - (d) National Park ;
 - (e) Photochemical smog ;
 - (f) Environmental Stress ;
 - (g) Minamata disaster ; and
 - (h) Sustainable development.
2. Write short notes any *two* on the following : 2×5
- (a) Ramsar Site ;
 - (b) Red Data Book ;
 - (c) Ozone hole ; and
 - (d) Significance of Phytoremediation.

3. Define population. Enumerate the major attributes of population. Write note on r-strategy and K-strategy. 2+4+(2+2)
4. What is Alien Invasive Species (AIS)? Discuss with examples the harmful effects of invasive species on biodiversity loss. 2+(4+4)
5. Define biodiversity. Write the importance of biodiversity. Comment on the role of Indian Sunderbans Mangroves in biodiversity conservation. 3+3+4
6. Define greenhouse effect. Discuss the impact of greenhouse effect on agriculture and coast. 2+(4+4)
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(Microbiology)

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

1. Answer any *five* questions : 5×2
- (a) What is MRSA and VRSA ?
 - (b) Write down the function of Topoisomerase II and T₄ ligase.
 - (c) Distinguish between oncogene & protooncogene.
 - (d) What is bioplastic ? Mention the micro organism used for its production.
 - (e) Give examples for each of a recombinant vaccine and attenuated vaccine.
 - (f) Write down the raw materials used and microorganism involved in industrial production of Citric acid.
 - (g) What is the full form of AFM and ATCC.
 - (h) How does aerobic N₂ fixing bacteria protect their nitrogenase from oxygen ?

2. (a) Write down the structure of nitrogenase.
- (b) Draw and describe the process of *Rhizobium* infection in legume root.
- (c) What is 'leg' haemoglobin? 3+5+2
3. (a) Write down the municipal waste water treatment system.
- (b) Write down the micro organisms involved and raw materials used for the production of lactic acid, glutamic acid and citric acid. 4+6
4. Write short notes on (any four) : 4×2½
- (a) Application of amylase ;
- (b) Natural passive immunity ;
- (c) ELISA ;
- (d) Mycoplasma ;
- (e) Viroids ;
- (f) T Lymphocyte
- (g) Prions
- (h) Mode of action of protease.

5. (a) What is C-DNA library? How it differs from genomic library? 1+2
- (b) What is idiophase? Write down different components of a bioreactor. 1+2
- (c) Mention the serological methods employed in common medical practices. 4
6. (a) What is icosahedral symmetry of a virus? Give an example.
- (b) Write down different process for enumeration of viruses.
- (c) How animal viruses are cultural? (2+1)+3+4
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(Palaeobotany and Palynology)

1. Answer any *five* questions :

5×2

- (a) Define unconformity.
- (b) Differentiate silt from clay.
- (c) What is 'isotype'?
- (d) What is meant by 'taphonomy'?
- (e) Define a 'fault'.
- (f) What is index fossil? Cite an example.
- (g) Name two important megafossil elements of Talchir Formation.
- (h) What is seafloor spreading?

2. Answer any *two* :

2×5

- (a) How can you establish the organic origin of crude petroleum?
5
- (b) Describe in brief the process of formation of coal from peat.
5

- (c) Briefly describe the megafloristics of Rajmahal Formation. Mention the age of the sequence. 4+1
- (d) Briefly describe the elements of Cathaysia flora of Permo-Carboniferous floral provinces. 5

3. Answer any two : 2×10

- (a) Mention the age of 'Karewas Formation'? Give an account of the Pleistocene Vegetational history of Kashmir valley as revealed from pollen analysis. 1+9

- (b) What does it mean by the Indian Gondwana sequence? Discuss the basis of three fold classification of the sequence, Describe the miofloristics of Middle Gondwana in Son-valley basin. 2+2+6

- (c) State the principles of continental drift hypothesis. How do the palaeontological evidences support this hypothesis? Explain the concept of 'plate tectonics'. 3+4+3

- (d) Name the formal subdivisions of the Precambrian sequence. Describe the different life-forms met with through the sequence. 2+8