

2015

(May)

BOTANY

(Major)

Course : 604

(Biophysics and Bioinformatics)

Full Marks : 48

Pass Marks : 19

Time : 2 hours

*The figures in the margin indicate full marks
for the questions*

1. (a) Choose the correct answer of the following : 1×3=3
- (i) A laser is a device that emits light/heat/sound through a process of amplification based on the stimulated emission of electromagnetic radiation.
 - (ii) In general, organisms can inherit genes in two ways—vertical gene transfer and tangential/horizontal/oblique gene transfer.
 - (iii) Radioactive isotopes are comprised of stable/unstable isotopes.

(2)

(b) Fill up the blanks :

- (i) — is regarded as the 'mother and father of bioinformatics'. $1+1=2$
- (ii) High performance liquid chromatography (HPLC) is basically a highly improved form of — chromatography.

(c) Write short accounts on the following :

- (i) Phylogenetic tree $3 \times 3 = 9$
- (ii) Entrez
- (iii) Redox potential

2. What is crystallography? Give an account of the principle, application and scope of X-ray crystallography. $2+(2+2+5)=11$

Or

"Biophysics spans all levels of biological organization from the molecular scale to whole organisms and ecosystems." Justify the statement giving a detailed account of the scope of biophysics. 11

3. What do you mean by biological database? How can you classify biological databases? Give a detailed account of protein synthesis database with special reference to SWISSPROT database. $2+4+5=11$

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(Continued)

(3)

Or

What is bioinformatics? What is its scope? Give an account of sources of bioinformatics emphasizing networking and system biology. $2+4+5=11$

4. Write short accounts on the following (any three) : $4 \times 3 = 12$

- (a) Bioenergetics
- (b) pH and buffer solution
- (c) Basic concept of NMR
- (d) NCBI
- (e) Methods of sequence alignment

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