

[This question paper contains 4 printed pages.]

Sr. No. of Question Paper : 699

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Your Roll No.....

Unique Paper Code : 216/223/558

Name of the Paper : Bioinformatics (LSPT-409)

Name of the Course : **B.Sc. (Hons.) Botany**

Semester : V

Duration : 3 Hours

Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Question No. 1 is compulsory.
3. Attempt a total of five questions, including Q. No. 1 which is compulsory.

1. (a) Define any five of the following terms : (1×5=5)

(i) Clustal W

(ii) PDB

(iii) Ortholog

(iv) Ref Seq

(v) Gene Expression Database

(vi) NCBI

(vii) Webin

(b) Expand the following : (1×5=5)

(i) OMIM

P.T.O.

- (ii) DDBJ
- (iii) ORF
- (iv) NDB
- (v) MSA
- (vi) GEO
- (vii) LIBRA

(c) Match the following : (1×5=5)

- | | |
|---|-------------------|
| (i) Gene Expression Database | (a) OMIA |
| (ii) Data retrieval system of NCBI | (b) SAKURA |
| (iii) Annotated protein sequence database | (c) Array Express |
| (iv) Data submission at DDBJ | (d) <i>Entrez</i> |
| (v) An animal disease database | (e) Swiss Prot |

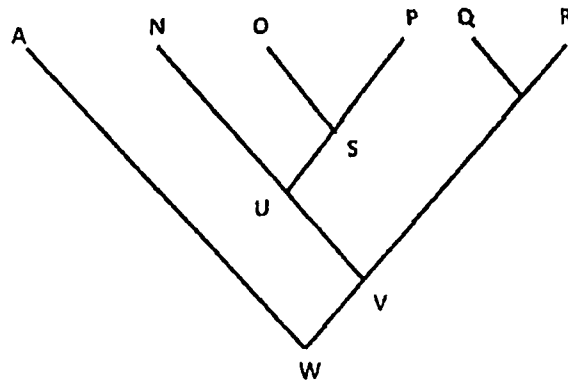
2. Write short notes on any five of the following : (5×3=15)

- (i) PHYLIP
- (ii) *In silico* drug designing
- (iii) Molecular clock
- (iv) Data submission tools of DDBJ
- (v) Microbial genome application
- (vi) Sequence submission to NCBI
- (vii) TrEMBL

3. (a) Differentiate between any **four** of the following : (4×3=12)

- (i) Paralogous and orthologous sequences
- (ii) Archival and derivative database
- (iii) Maximum parsimony and neighbor joining
- (iv) Rooted and unrooted phylogenetic tree
- (v) Bankit and Webin

(b) Answer the following questions based upon the phylogenetic tree given below : (1×3=3)



- (i) Which of the taxa forms monophyletic clade ?
 - (ii) Which of the taxa form polyphyletic clade ?
 - (iii) Which is the most recent ancestor of O, P and Q ?
4. (a) Define BLAST. Discuss different types of tools available in BLAST.
- (b) Discuss the databases of PIR. (10+5=15)
5. (a) What is EMBL ? Enumerate various resources and tools of EMBL.
- (b) Discuss the specialized tools of NCBI. (10+5=15)

6. (a) Enumerate the significance of computational biology for crop improvement.
- (b) Explain SAR and QSAR in detail. (9+6=15)