ODD SEMESTER

BIO INFORMATICS (SAC5B)-SESSION PLAN

SESSION NO	TOPICS TO BE COVERED	TEACHING METHOD
UNIT-I		
1	Genomic sequences-DNA,RNA,Peptide seuences,sequence analysis and sequencing	BB
2	Output management from different biological output sources-Biological databases,DDBJ,Gen cord,NCBI,PIR	BB
3	Gene prediction rules –Introduction, About codons,Exons	PPT
4	Gene finding rules in Prokaryotes and Eukaryotes	BB
5	Gene finding programs in Prokaryotes and Eukaryotes-based on algorithm	PPT
6	Gene prediction software – GenScan, GenView 2, NetGene 2 ORF **Gene** - **Gene** Structure **Prediction** using Homologous Proteins.	BB
5	Human Genome Project – Introduction,History,Applications,Ethical and social Issues	BB
6	Human Genome Project analysis Software at NCBI- RefSeq Proteins, ClinVar	PPT
7	Mutations-Introduction, Mis Sence databases, HGMD	BB
8	Population studies –Introduction, Demographic Model, HFD,HFC,DAT life	BB
9	cDNA sequences –Definition ,Retrieving Datas, EMBL,EBI	BB
10	**Revision of unit-I**	Group discussion

	UNIT-II		
11	Gene therapy- Introduction, Potential uses of Gene therapy	BB
12	Types of gene therapy-Exvivo, Invivo, Methods for inserting and expressing a gene in target cell,Virus mediated gene transfer systems	BB
13	Applications of gene therapy-Advantages and Disadvantades	BB
14	Analysis of genomic and proteomic information with respect to biological systems –Gene expression studies,Determination of tumor marker genes.	BB
15	Genome application – Transgenic animals –Introduction, Methods of production of transgenic animals, Gene transfer methods	BB
16	Examples of transgenic animals-Transgenic fish, Transgenic Pig, Transgenic mouse, Transgenic live stock	PPT
17	Transgenic Plants –Introduction, Methods of production of transgenic plants, Gene transfer methods.	BB
18	Examples of transgenic animals- High glysine corn, Herbicide tolerant plants, BT cotton	BB
19	Drug design - Introduction, History ,targets , Types ,Mechanism based design, Structure based, ligand based	Group discussion
20	Drug discovery - Introduction, History ,Therapeutic development pipeline, Target Selection	BB
21	Drug identification- Introduction, Drug Schedules, Drug categories, Stimulants	BB
22	Synthesis of new drugs-Stages, Preclinical trails, Clinical trails, Drug discovery phase	BB

23	Animal Studies in Synthesis of new drugs-Pharmaco dynamic studies, Toxicological studies	BB
24	Management of diverse chemical libraries-Definition, Purpose, Generation, Design and optimization, Storage and development	BB
25	**Revision of unit-II**	BB
CIA TEST-I		
UNIT-III		
26	Gene expression- Introduction, Central dogma, Replication of DNA, Steps in replication, Enzymes in Gene expression	BB
27	Gene expression-Translation, Termination, Pribnow box, Steps in Translation &Termination	BB
28	Classification of Cancer types-Definition, Types of cancer, Examples of cancer, Diagnosis &Treatment	BB
29	Genes; Oncogenes -protooncogenes –Regulatory genes, Factors activating genes, Tumour suppressor genes	BB
30	Application of Microarrays in Drug toxicity testing-Microarray technology, Hybridization, Detection	BB
31	Microarrays in Drug toxicity testing –Microscope slide, Applications & limitations	BB
32	Metabolic pathways-Introduction, Metabolism-Catabolism, Anabolism, Energy Production, Enzymes action	PPT
33	**Revision of unit-III**	BB
CIA TEST-II		
UNIT-IV		

34	Sequence analysis(Proteins)- Sequencing, Alignment, Fluoresence based sequencing, Methods- Edman degradation, Mass Spectroscopy	BB
35	Protein Sequencing methods-Pair wise Alignment, Multiple sequence Alignment	BB
36	Sequence analysis (Nucleic acids) –Data base –BLAST, NCBI, DDBJ, Overview of Gen bank	BB
37	Sequence alingment methods -Introduction, Types, Methods, Applications	BB
38	Sequence alingnment methods-DOT matrix, Dynamic Programming method, Work method or K-tuple method	BB
39	Proteomic-Definition ,Proteome, Types, Structure of protein, Tools of Proteomics	BB
40	Proteins analysis – structural comparisons – 2D gel-Introduction, Principle, Overview, Steps, Sample Preparation, SDS-PAGE	Group discussion
41	Proteins analysis – structural comparisons –Mass spec-Introduction, Principle, Overview, Steps, Instrumentation, Applications	BB
42	Protein arrays related disease-Analytical Protein array, Instrumental Protein array, Biochemical activities	BB
43	Antibody arrays related disease-ELISA, DNA, Tissue microarray	PPT
44	Preventive arrays related disease-Concepts, Timeline approaches, Prevention approaches, Types of arrays	BB
45	**Revision of unit-IV**	Group discussion
CIA TEST-III		

	UNIT-V		
46	Protein Database: Definition, Examples,Applications.	BB
47	Protein Database -SWISS-PROT,Tr EMBL,NRL,PDB,CATH	BB
48	Comparison of Protein sequences and Database searching – Introduction, Pro CKSI, Results, Conclusion	BB
49	Methods for protein structure prediction –levels of Protein Structure	BB
50	Methods for protein structure prediction-NMR,X ray Crystallography, Electron Microscopy	BB
51	Conserved patterns in protein sequences and structures –	BB
52	Comparison of protein 3D structures –Different types of methods	BB
53	Predicting functions based on DNA and protein sequences-FASTA programs, Primary, Secondary, Composite	BB
54	Predicting functions-Prediction Strategies, Methods,GOR Method	PPT
55	**Revision of unit-V**	Group discussion
	Revision		
56	Revision of unit--I	BB
57	Revision of unit- II	BB
58	Revision of unit-III	BB
59	Revision of unit-IV	BB

6O	Revision of unit-V	BB
	MODEL EXAM	

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