Course: MICROBIOLOGY PG

Semester	2
Paper Number	MMCB4212
Paper Title	MOLECULAR BIOLOGY & RECOMBINANT DNA TECHNOLOGY
No of credits	6
Non composite/composite	Composite
No. of periods assigned	6
Course description/objective	• To know the basic processes of replication, transcription and translation • To know the principles and methods of recombinant DNA technology • To know the techniques of recombinant DNA technologies
Reference List	Benjamin Lewin (2013) Genes IX .Jones and Bartlettpublishers Watson,J.D., Hopkins,N .H ., Roberts, J.W., Steitz,J.A and Weiner,A.M(1987). Molecular Biology of the Gene . Benjamin-Cummings, Menlo Park California. Molecular Biology: RobertWeaver Molecular Biology :DavidClark Lehninger Principles of Biochemistry - Cox &Nelson Biochemistry - VoetandVoet. Biochemistry Berg –Tymoczko&Stryer Principles of Gene Manipulation & Genomics-Primrose&Twyman. Glick,B.R., Pasternak, J.J.(2003) Molecular biotechnology 3 rd edition.ASMPress
Evaluation	Theory: 70 (60 End sem + 10 CIA) Practical: 30 (10 End sem + 20 CIA) **Question Paper format: theory end semester** **Module 1: 30 marks** SHORT QUESTION: FROM **7** QTNS **ANSWER 5 (EACH 2 MARKS)** = 5X2=10 LONG QUESTION: FROM **6** QTNS **ANSWER 4 (EACH 5 MARKS)**= 4X5=20 **Module 2: 30 marks** SHORT QUESTION: FROM **7** QTNS **ANSWER 5 (EACH 2 MARKS)** = 5X2=10 LONG QUESTION: FROM **6** QTNS **ANSWER 4 (EACH 5 MARKS)**= 4X5=20 Viva: End sem 10 marks

MOLECULAR BIOLOGY AND RECOMBINANT DNA TECHNOLOGY

THEORY 70

- **Module 1: Molecular Biology(35MARKS)**

Replication: Basic Features of Prokaryotic DNA Replication, Comparison with the EukaryoticCounterpart.

Transcription - RNA polymerases in prokaryotes and eukaryotes, Transcription signals, Promoters and Enhancers, Initiation and Elongation of RNA synthesis, Rho dependent and Rho independent termination, Transcription factors in Eukaryotes, Prokaryotic and Eukaryotic Transcription. Experiments in support of the events .Major shifts in Bacterial Transcription

Translation: Basic Features of Prokaryotic Translation, Comparison with the Eukaryotic Counterpart.

Transposon (SSC)

- **Module 2:Recombinant DNATechnology(RDT) (35MARKS)**

Principles and methods of recombinant DNA technology- hybridization, cloning, sequencing, polymerase chain reaction, genome projects; gene manipulations; cloning in *E.coli*, plasmids,

Yeasttwohybridsystem,MammalianExpressionvectors.ConstructionandcomparisonofgenomicandcDNAlibrary,reversetranscription,Genomemapping, DNA fingerprinting, Phagedisplay.

PRACTICAL: 30 MARKS

1. Isolation of bacterial genome and plasmidDNA,
2. restriction enzymedigestion,
3. restriction mappingand
4. Bacterial Transformation

Reference:

1. Benjamin Lewin (2013) Genes IX .Jones and Bartlettpublishers
2. Watson,J.D., Hopkins,N .H ., Roberts, J.W., Steitz,J.A and Weiner,A.M(1987). Molecular Biology of the Gene . Benjamin-Cummings, Menlo Park California.
3. Molecular Biology: RobertWeaver
4. Molecular Biology :DavidClark
5. Lehninger Principles of Biochemistry - Cox &Nelson
6. Biochemistry - VoetandVoet.
7. Biochemistry Berg –Tymoczko&Stryer
8. Principles of Gene Manipulation & Genomics-Primrose&Twyman.
9. Glick,B.R., Pasternak, J.J.(2003) Molecular biotechnology 3 rd edition.ASMPress
10. Brown T.A.(2010) Gene Cloning & DNA Analysis 6 th edition. Wiley-Blackwell Publishers 4. Sambrook, J and Russell,D.W.(2001) Molecular Cloning : a laboratory manual 3 rd edition. Cold Spring Harbor laboratory Press
11. Molecular Biology of the Gene by Watson *etal*