SSESA's Science College, Congress Nagar, Nagpur

Preliminary Examination

Winter – 2023

B.Sc. Sem-V

Subject: Microbiology

Paper: II

Time: Three Hours | Max. Marks: 50

Note:

1) All questions are compulsory and carry marks as indicated.
2) Draw neat and well labelled diagram wherever necessary.

Q.1.	Discuss the mechanism of induced mutation in detail.	10
	OR	
A)	Explain the concept ofgene within gene.	21/2
B)	Write note on physical mutagens.	21/2
C)	What is photoreactivation? Discuss about exciting radiations.	21/2
D)	Explain intergenic suppression along with examples.	21/2
Q.2.	Describe the process of transduction in detail.	10
	OR	
A)	Write a note on types of recombination.	5
B)	Explain in detail the concept of transformation.	5
Q.3.A)	Explain the principle & applications of UV-Visible spectroscopy.	5
B)	Explain the principle & applications of differential centrifugation.	5
	OR	
C)	Explain the principle & applications of agarose gel electrophoresis.	5
D)	Explain the principle & applications of analytical centrifugation.	5
Q.4.A)	Explain the method & application of isotope tracer technique.	5
B)	Describe in detail gel filtration chromatography.	5
	OR	
C)	Explain the concept of ion exchange chromatography in detail.	5
D)	Discuss the types and applications of scintillation counter.	5
Q.5.	Solve any **Ten** of the following:	
I)	What is site specific recombination?	1
II)	Define IS elements?	1
III)	What is Frame shift mutation?	1
IV)	Define spontaneous mutation.	1
V)	What are base analogues?	1
VI)	Define Beer Lambert's Law.	1
VII)	What is PAGE?	1
VIII)	What is isotope?	1
IX)	Define centripetal force & centrifugal force.	1
X)	What do you mean by R*f value*?	1
XI)	Define episome.	1
XII)	Give two factors affecting electrophoresis mobility.	1

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Bachelor of Science (B.Sc.) Semester–V Examination

BIOTECHNOLOGY-MOLECULAR BIOLOGY AND rDNA TECHNOLOGY

Optional Paper–2

Time : Three Hours] [Maximum Marks : 50

N.B. :— (1) All questions are compulsory and carry equal marks.

(2) Draw diagrams wherever necessary.

1. Write notes on :

(a) Attachment of amino acids to tRNA. 5

(b) Aminoacyl tRNA synthetases. 5

OR

Describe in detail how the genetic code was deciphered. 10

2. Describe the initiation process of prokaryotic protein biosynthesis. 10

OR

(a) Describe the role of release factors in prokaryotic translation. 5

(b) Describe the role of antibiotics affecting translation process. 5

3. Describe the technique of transformation and transfection. Add a note on selection of transformed cells. 10

OR

(a) Describe briefly the pUC series of vectors. 5

(b) Describe briefly the restriction endonucleases. 5

4. Describe in detail the applications of rDNA technology in medicine and agriculture. 10

OR

Write short notes on :

(a) Expression vectors 2½

(b) Primer designing 2½

(c) cDNA library 2½

(d) Steps in PCR technique. 2½

(Contd.)

5. Solve any TEN of the following (1 mark each) :

(i) To which end of tRNA, the amino acid is attached ?

(ii) Who proposed Wobble hypothesis ?

(iii) Give any one role of Shine-Dalgarno sequence.

(iv) Name any one elongation factor used in protein biosynthesis.

(v) Name the factor which separates the large and small subunit of ribosomes.

(vi) What is meant by autogenous control ?

(vii) What is meant by pBR322 ?

(viii) What is meant by "EcoRI" ?

(ix) Name the enzyme efficient in blunt-end ligation.

(x) Give any one advantage of cDNA library over genomic library.

(xi) Name any one rDNA product used in the field of medicine.

(xii) Why two primers which are 90% complementary to each other cannot be used as primers in the PCR technique ? Give any one reason. 1×10=10

Bachelor of Science (B.Sc.) Semester—V (C.B.S.) Examination

BIOTECHNOLOGY – MOLECULAR BIOLOGY AND rDNA TECHNOLOGY

(Optional Paper–2)

Time : Three Hours] [Maximum Marks : 50

Note:—All questions are compulsory and carry equal marks.

1. Describe in detail the attachment of amino acids to t-RNA. 10

OR

Describe various characteristics of genetic code. 10

2. (a) Explain autogenous control of r-proteins. 5

(b) Describe the role of release factors in prokaryotic translation. 5

OR

(c) Write a note on role of initiation factors in protein biosynthesis. 5

(d) Describe the role of antibiotics affecting translation process. 5

3. (a) Explain the pUC series of vectors. 5

(b) Describe briefly the restriction endonucleases. 5

OR

(c) Describe briefly the selection of transformed cells. 5

(d) Write a note on cohesive end ligation. 5

4. (a) What are expression vectors ? 2½

(b) Write the advantages of c-DNA library over genomic DNA Library. 2½

(c) Write a short note on steps in PCR technique. 2½

(d) Write the applications of r-DNA technology in Medicine. 2½

OR

(e) What is genomic DNA Library ? 2½

(f) Write a short note on primer designing. 2½

(g) Write the problems which occur during expression of eukaryotic gene in prokaryotic. 2½

(h) Give the applications of r-DNA technology in agriculture. 2½

5. Write any **Ten** of the following : 1×10=10

(i) Who proposed wobble hypothesis ?

(ii) Give any one role of Shine-Dalgarno sequence.

(iii) What is the amino acid binding sequence in t-RNA ?

(iv) Name any one prokaryotic elongation factor.

(v) Name the factor which separates the large and small subunit of ribosomes.

(vi) What is the role of $_{p}^{32}$ in translational regulation ?

(vii) What is the difference between transformation and transfection ?

(viii) Name the enzyme capable of blunt end ligation.

(ix) Give example of phage vector.

(x) Give any one disadvantage of c-DNA library over genomic library.

(xi) What is Tm in PCR ?

(xii) Define c-DNA library.

Bachelor of Science (B.Sc.) Semester—V (C.B.S.) Examination

BIOTECHNOLOGY – MOLECULAR BIOLOGY AND rDNA TECHNOLOGY

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(ix) Give example of phage vector.

(x) Give any one disadvantage of c-DNA library over genomic library.

(xi) What is Tm in PCR ?

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Bachelor of Science (B.Sc.) Semester–VI Examination

BIOTECHNOLOGY

Plant and Animal Biotechnology

Optional Paper–2

Time : Three Hours] [Maximum Marks : 50

N.B. :– (1) All questions are compulsory and carry equal marks.

(2) Draw diagrams wherever necessary.

1. Describe initiation and maintenance of callus culture. 10

OR

Write notes on :

(a) Laboratory facilities required for Plant Tissue Culture. 5

(b) Single cell clones. 5

2. Briefly discuss the role of tissues in Micropropagation. 10

OR

Write notes on :

(a) Regeneration of protoplasts. 5

(b) Bt cotton. 5

3. Describe in detail the laboratory facilities required for Animal Tissue Culture. 10

OR

Write notes on :

(a) Contact inhibition and Anchorage dependence. 5

(b) Cell senescence 5

4. Describe various steps involved in in-vitro fertilization and embryo transfer in human. 10

OR

Write notes on :

(a) Production of insulin. 5

(b) Transgenic Animals. 5

5. Solve any **ten** of the following :

(i) Define Explant.

(ii) What is the role of antibiotics in PTC media ?

(iii) What is synchronization of cultured cells ?

(iv) What is a Haploid ?

(v) What are Cybrids ?

(vi) What is Ti plasmid ?

(vii) What is Trypsinization ?

(viii) What are Immortal cells ?

(ix) What is a Primary culture ?

(x) What is Gene therapy ?

(xi) What are recombinant DNA vaccines ?

(xii) What is the role of somatostatin ? 10×1=10