2015

M.Sc.

3rd Semester Examination

MICROBIOLOGY

PAPER—MCB-301

Full Marks : 40

Time : 2 Hours

The figures in the right-hand margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

NEW SYLLABUS

Answer any *two* questions from each group.

Group — A

[*Marks : 20*]

1. (a) You isolate two mitochondria from two different cells. You determine that the membranes are differ in their fluidity. Cell A's mitochondrial membrane is more fluid over cell B's. Discuss which mitochondria will be better able to import proteins, and why ? 4

(b) What will happen within a cell if 'Tyr' is mutated in the genes that code for CDK2 and CKD4 ? 2

(c) Briefly discuss the involvement of all CDKs with their specific cyclins and cell cycle stages. 4

2. (a) Describe in detail the different types of cell junctions in mammalian cell and their individual importance. 4

(b) Illustrate the signaling pathway of Ras' mediated apoptosis. 2

(c) How P^{53} linked to DNA repair and apoptosis ? 3

(d) What are the mitogens ? 1

3. Write short notes on the following : $4 \times 2\frac{1}{2}$

(a) Oneogenes ;

(b) Animal Cell Culture ;

(c) Neurotransmission ;

(d) Haematopoietic stems cell.

Group — B

[*Marks : 20*]

1. (a) Brief describe Edman degradation procedure and write the significance of peptide sequence analysis.

(b) Write the principles and applicability of Pyrosequencing.

(c) Write a comparative account of Southern and Northern blotting. 3+2+3+2

2. (a) State the advantages of cosmid vector over plasmid vector. 2

(b) Describe in brief the application of genetic engineering in medicine. 3

(c) Schematically describe the isolation of gene codes for unknown product. 3

(d) What are the different types of promoter that are generally used for preparation of expression vector ? Cite example for each. 2

3. Write short notes on the following (any *four*) : $4 \times 2\frac{1}{2}$

(a) YAC ;

(b) Significance of Agrobacterium mediated gene transfer ;

(c) RFLP ;

(d) Gene knockout technique and its application ;

(e) Nested PCR.

OLD SYLLABUS

Answer any *two* questions from each group.

Group — A

[Marks : 20]

1. (a) Write the principle and applications of PCR. State the importance of primer design in PCR.

   (b) Write the principles of different steps of southern blotting.

   (3+2)+3+2

2. (a) State the advantages of cosmid vector over plasmid vector.

   (b) Write the role of SDS in SDS-RAGE.

   (c) Describe about the isolation of gene codes for unknown protein.

   (d) State the blue-white selection of PUC 19 vector.

   2+2+3+3

3. Write short note on the following (any *four*) : $4 \times 2\frac{1}{2}$

   (a) T-DNA ;

   (b) YAC ;

   (c) Reverse Transcriptase PCR ;

   (d) Shuttle Vector ;

   (e) Protein sequencing.

Group — B

[Marks : 20]

1. (a) How do you join two DNA fragment, one digested with ECORI and another with Bam H1 ? 2

(b) Schematically state the preparation of genomic library of an organism. 3

(c) In which aspects genomic library is differ from C-DNA library ? 2

(d) State the importance of Agrobacterium mediated gene transfer. 3

2. (a) What are the basic requisites for preparation of chimesic DNA ? 2

(b) What is edible vaccine ? 2

(c) What is isochizomer ? Cite an example. 2

(d) State the process of preparation of superbug and its utility. 3+1

3. Write short notes on the following (any *four*) : $4 \times 2\frac{1}{2}$

(a) YAC ;

(b) Recombinant therapeutic protein ;

(c) Role of DNA ligase in RDT ;

(d) Harards of genetic engineering ;

(e) Bt-crop.

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