

VJF AK15 tV
(AUTONOMOUS)
MSc DEGREE EXAMINATION MAY 2019
(Second Semester)

Branch - **BIOTECHNOLOGY**

RECOMBINANT DNA TECHNOLOGY

Time: Three Hours

Maximum: 75 Marks

SECTION-A (IQ Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(10 x 1 = 10)

- 1 Who discovered restriction enzymes?
 - (i) Nathan, Arber and Smith in 1970
 - (ii) Watson, Crick and Wilkins in 1970
 - (iii) Boyer and Cohen in 1975
 - (iv) Paul Berg in 1975
- 2 Which of these restriction enzymes produce blunt ends?
 - (i) Sail
 - (ii) EcoRV
 - (iii) Xho I
 - (iv) Hind III
- 3 Find, why the yeast cells frequently used as hosts for cloning?
 - (i) they easily form colonies
 - (ii) they can remove exons from mRNA
 - (iii) they do not have plasmids
 - (iv) they are eukaryotic cells
- 4 Which one of the following is first engineered plasmid vector?
 - (i) pBR 322
 - (ii) pUC vectors
 - (iii) pSC 101
 - (iv) pUC 19
- 5 Choose the incorrect statement for cDNA libraries. (47)
 - (i) They constitute of DNA copies produced from the RNA sequences and usually mRNA
 - (ii) They represent expressed sequences
 - (iii) Introns are not presented
 - (iv) Comparison of cDNA sequences with genomic sequences leads to determination of polyadenylation sites
- 6 Which of the following does not apply to the construction or use of a DNA library?
 - (i) Determining the location of a particular DNA sequence in a DNA library requires a suitable hybridization probe
 - (ii) Genomic libraries are better for expressing gene products than cDNA libraries
 - (iii) Many segments of DNA from a cellular genome are cloned
 - (iv) Specialized DNA libraries can be made by cloning DNA copies of mRNAs
- 7 Which of the following is untrue about DNA sequencing methods?
 - (i) Purified fragments of DNA cut from plasmid/phage clones or amplified by polymerase chain reaction (PCR)
 - (ii) Clones of DNA fragments are denatured to single strands, and one of the strands is hybridized to an oligonucleotide primer
 - (iii) Taq polymerase is quite heat sensitive
 - (iv) New strands of DNA are synthesized from the end of the pointer
- 8 Which of the following infection(s) can be diagnosed by the use of polymerase chain reaction?
 - (i) HIV - 1 and HIV - 2 viruses
 - (ii) Hepatitis B virus
 - (iii) Mycobacterium tuberculosis
 - (iv) All of these

Cont...

- 9 Which of the following properties is improved by site directed mutagenesis?
 (i) Physical property (ii) Chemical property
 (iii) Kinetic property (iv) Integrity
- 10 Which phage is used in oligonucleotide directed mutagenesis?
 (i) M13 (ii) cosmid
 (iii) phagemid (iv) X-phage

SECTION - B (25 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks (5 x 5 = 25)

- 11 a. Explain the novel restriction enzymes from lower plants in short.

OR

- b Discuss gene isolation strategies in brief.

- 12 a Write a note on natural plasmids.

OR

- b Explain about artificial plasmids.

- 13a Phage artificial chromosome as vectors - justify.

OR

- b Explain about protein extraction and purification method in brief.

- 14 a Illustrate the Di-deoxy chain termination method of DNA sequencing.

OR

- b Evaluate autoradiography and fluorescence dye chemistries.

- 15 a State site directed mutagenesis in short.

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OR

- b Discuss in brief about gene editing.

SECTION -C (40 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks (5 x 8 = 40)

- 16 a Analyse the gene markers used for selection of recombinants.

OR

- b Justify the gene cloning strategies in detail.

- 17 a Enumerate the vectors for cloning in *Bacillus* and *Streptomyces*.

OR

- b Analyse the construction and biology of pUC 18 and pBR322.

- 18 a Analyse the construction and screening of genomic DNA library.

OR

- b Elucidate the construction of cDNA library.

- 19 a Evaluate the methods of real time PCR.

OR

- b Compare the slab gel based electrophoresis and capillary based gel electrophoresis.

- 20 a Analyse the PCR based methods for site directed mutagenesis.

OR

- b Appraise mis-repair of mutant oligonucleotides and selection of mutants.