

NEET FOUNDATION — BIOLOGY MCQs

1. In order to extract DNA we use the following enzyme for the following organism, which matching is correct?
 - (a) Plant cell-Cellulose
 - (b) Fungus-Chitinase
 - (c) Bacteria-Lysozyme
 - (d) All are correct
2. Which of the following is true about EFB definition of biotechnology?
 - (a) It includes traditional view
 - (b) It includes modern molecular biotechnology
 - (c) Definition is the integration of natural science and organisms, cells, parts thereof, and molecular analogues for products and services
 - (d) All of the above
3. Select the false statement from the following.
 - (a) Genetic engineering includes techniques to alter chemistry of genetic material (DNA and RNA).
 - (b) Sexual reproduction is more advantageous than asexual reproduction.
 - (c) Genetic engineering allows us to introduce desirable set of genes without the undesirable gene into the target organism.
 - (d) Plasmid is autonomously replicating linear extra chromosomal DNA.
4. We can cut DNA with the help of
 - (a) DNAase
 - (b) RNAase
 - (c) Knife
 - (d) Restriction enzyme
5. Who isolated antibiotic resistance gene from salmonella typhimurium in 1972?
 - (a) Jacob and Monod
 - (b) Stanley Cohen and Herbert Boyer
 - (c) Osborn
 - (d) Boliver
6. Hind II recognizes a specific sequence of how many base pairs?
 - (a) 4
 - (b) 6
 - (c) 8
 - (d) 10
7. Select the incorrect statement.
 - (a) More than 900 restriction enzymes have been isolated from over 230 strains of bacteria.
 - (b) In the year 1963, the two enzymes responsible for restricting the growth of bacteriophage in Escherichia coli were isolated.
 - (c) Some key tools for recombinant DNA technology are restriction enzyme, polymerase enzyme, ligase, vectors and host root organisms.
 - (d) EcoRI cut the DNA between bases A and T only when the sequence GAATTC is present in the DNA.

8. In 'EcoRI' 'co' stands for

- (a) Genus
- (b) Species
- (c) Strain
- (d) Restriction enzyme

9. Restriction enzyme breaks

- (a) Glycosidic linkage
- (b) H-bond
- (c) Sugar-phosphate linkage
- (d) All of the above

10. EcoRI cut palindrome sequence which produces overhanging stretches called sticky ends on each strand. These are named sticky because

- (a) They can combine with any DNA.
- (b) They form hydrogen bonds with their complementary cut counterpart.
- (c) They facilitate the action of the enzyme DNA ligase.
- (d) Both
- (b) and
- (c)

11. The fragmented DNA can be visualized by staining DNA with

- (a) NaCl
- (b) Ethidium bromide
- (c) Ethylene bromide
- (d) NaBr

12. Find the true statement.

- (a) Ori means origin of transcription.
- (b) Some bacterial cell may have copy number of plasmid vary from 15-100.
- (c) Vector should have many recognition sites for commonly used restriction enzymes so that alien DNA can attach to any one of the sites easily.
- (d) tetR gene in pBR322 can be cleaved by Pvu I and Pst I.

13. If alien DNA is introduced using Sal I in pBR322 then transformant will grow on

- (a) Ampicillin
- (b) Tetracycline
- (c) Both
- (d) None

14. Select the incorrect statement.

- (a) Selection of recombinants due to inactivation of antibiotic is a cumbersome procedure.
- (b) Insertional inactivation of β -galactosidase leads to colorless colonies.
- (c) Insertional inactivation of β -galactosidase leads to blue color colonies.
- (d) In insertional inactivation, the r-DNA is inserted within the coding sequence of an enzyme β -galactosidase.

15. To make bacterium competent (Transformation with recombinant DNA) we use

- (a) Specific concentration of Ca^{2+} ion
- (b) Heat shock (42°C)
- (c) Both
- (d) None

16. Restriction enzyme 'A' is

- (a) Pst I
- (b) Pvu II
- (c) Bam HI
- (d) Sal I

17. Arrange the following process in the sequence used in r-DNA technology. (1) Isolation of DNA (2) Fragmentation of DNA by RE (3) Isolation of desired DNA fragment (4) Ligation of DNA fragment into vector (5) Transferring r-DNA into host (6) Culturing host cells in a medium at large scale (7) Extraction of the desired product

- (a) 1, 2, 3, 4, 5, 6, 7
- (b) 1, 2, 3, 4, 6, 5, 7
- (c) 2, 1, 3, 4, 5, 6, 7
- (d) 1, 2, 3, 5, 4, 6, 7

18. Biotechnology mainly uses

- (a) GMO
- (b) Bacteria
- (c) Virus
- (d) Animals

19. Which of the following is used to check progression of restriction enzyme digestion?

- (a) PCR
- (b) ROP
- (c) AGE
- (d) All

20. PCR includes

- (a) Denaturation
- (b) Annealing
- (c) Extension
- (d) All of these

21. If any protein encoding gene is expressed in a _____ host, it is called a _____ protein.

- (a) homologous host, recombinant
- (b) heterologous host, recombinant
- (c) heterologous host, non-recombinant
- (d) homologous host, non-recombinant

22. The host cultured in a continuous culture system where inside the used medium is drained out from one side while fresh medium is added from the other to maintain cells in their physiologically _____ phase.

- (a) lag
- (b) log
- (c) stationary
- (d) declining

23. Following will be done with product formed by r-DNA technology?

- (a) Product has to be formulated with suitable preservation.
- (b) Formulation has to undergo clinical trials.
- (c) Strict quality control testing is done.
- (d) All of the above

24. r-DNA is a

- (a) Chimeric DNA
 - (b) Hybrid DNA-RNA
 - (c) Recombinant of vector DNA and desired gene/s
 - (d) Both
- (a) and
- (c)

25. Plasmids are

- (a) ss-DNA
- (b) ds-DNA (linear)
- (c) ds-DNA (circular)
- (d) denatured-DNA

26. Restriction enzymes recognize specific

- (a) Palindromic region
- (b) Exons
- (c) Introns
- (d) None of these

27. Restriction endonuclease is a

- (a) Enzyme for transcription
- (b) Molecular blade
- (c) Enzyme for replication
- (d) Enzyme for transduction

28. Plasmids are

- (a) Extranuclear genes of bacteria
- (b) Endosymbiont of bacterial cells
- (c) Best vector DNA
- (d) All of the above

29. Bacteriophages are used in biotechnology as

- (a) Vector or vehicle DNA
- (b) Cloning organism
- (c) Restriction enzyme synthesizers
- (d) None of the above

30. Engineered bacterium carries

- (a) Plasmids
- (b) r-DNA
- (c) c-DNA
- (d) ss-DNA

31. Oncogenic character is seen in

- (a) E. coli
- (b) pBR322 plasmids
- (c) T_i plasmids
- (d) R_i plasmids

32. Which is not a vector for r-DNA technology?

- (a) Plasmids
- (b) Cosmids
- (c) Phages
- (d) Mosquitoes

33. Which is a correct matching?

- (a) Denaturation — temperature is required for this process
- (b) Annealing — Taq polymerase required
- (c) Extension — Occurs at room temperature and deoxynucleotides are DNA polymerase
- (d) Amplification — 1 billion times in 10 cycles

34. The diagram represents which process?

- (a) PCR
- (b) DNA finger printing
- (c) CTAB
- (d) DNA spooling

35. Plasmids are suitable vector for gene cloning because

- (a) They are smaller circular DNA
- (b) They are linear DNA
- (c) They can shuttle between prokaryotes and eukaryotes
- (d) None of the above

36. Restriction endonuclease cuts

- (a) ds-DNA
- (b) ss-DNA
- (c) Single strand of ds-DNA
- (d) Both
- (b) and
- (c)

37. Biotechnology reveals use of

- (a) Microorganisms in industrial processes
- (b) r-DNA
- (c) Engineered bacteria for production of antibiotics and antibodies
- (d) All of the above

38. Tumour producing plasmid transforms

- (a) Animals
- (b) Plants
- (c) Bacteria
- (d) Fungi

39. PCR is related to

- (a) DNA cloning
- (b) DNA amplification
- (c) DNA selective replication
- (d) All of the above

40. T₄ plasmid used in plant genetic engineering is a plasmid of

- (a) Azotobacter
- (b) Rhizobium
- (c) Agrobacterium
- (d) Saccharomyces

41. Plasmids are a suitable vector for gene cloning because

- (a) they are small circular DNA capable of integrating with host genome.
- (b) they have site for origin of replication.
- (c) they can be used as a shuttle between prokaryotes and eukaryotes.
- (d) they often carry antibiotic resistance genes.

42. Gel electrophoresis is used for

- (a) construction of r-DNA
- (b) isolation of DNA
- (c) cutting of DNA
- (d) separation of DNA fragments according to their size or length

43. Restriction endonuclease

- (a) cuts DNA molecule at random
- (b) cuts DNA from specific palindromic site
- (c) restrict DNA synthesis
- (d) synthesize DNA

44. Which one of the following is commonly used in the transfer of foreign DNA to crop plants?

- (a) *Penicillium expansum*
- (b) *Trichoderma harzianum*
- (c) *Meloidogyne incognita*
- (d) *Agrobacterium tumefaciens*

45. Transgenic plants are the ones

- (a) grown in artificial medium after hybridization in the field
- (b) produced by a somatic embryo in artificial medium
- (c) generated by introducing foreign DNA into a cell and regenerating a plant from the cell
- (d) produced after protoplast fusion in an artificial medium

46. DNA or RNA segment tagged with radioactive molecules is called

- (a) Vector
- (b) Probe
- (c) Clone
- (d) Plasmid

47. In the PCR technology, the DNA segment is replicated over a billion times. This repeated replication is catalyzed by the enzyme

- (a) DNA polymerase
- (b) Taq polymerase
- (c) DNA dependent RNA polymerase
- (d) Primase

48. Significance of 'heat shock' method in bacterial transformation is to facilitate

- (a) binding of DNA to the cell wall
- (b) uptake of DNA through membrane transport proteins
- (c) uptake of DNA through transient pores in the bacterial cell wall
- (d) expression of antibiotic resistance gene

49. Which of the following bacteria is not a source of restriction endonuclease?

- (a) *Haemophilus influenzae*
- (b) *Escherichia coli*
- (c) *Agrobacterium tumefaciens*
- (d) *Bacillus amylol*

50. A bacterial cell was transformed with a recombinant DNA that was generated using a human gene. However, the transformed cells did not produce the desired protein. Reasons could be

- (a) human gene may have intron which bacteria cannot process.
- (b) amino acid codons for humans and bacteria are different.
- (c) human protein is formed but degraded by bacteria.
- (d) all of the above

51. Who among the following was awarded the Nobel Prize for the development of PCR technique?

- (a) Herbert Boyer
- (b) Hargovind Khurana
- (c) Kary Mullis
- (d) Arthur Kornberg

52. Biotechnology helps in synthesizing

- (a) New generation antibiotics
- (b) New vaccines
- (c) MAB
- (d) All of the above

ANSWER SHEET

Q. No.	Answer	Q. No.	Answer	Q. No.	Answer
1	d	19	c	37	d
2	d	20	d	38	b
3	d	21	b	39	b
4	d	22	b	40	c
5	b	23	d	41	b
6	b	24	d	42	d
7	d	25	c	43	d
8	b	26	a	44	b
9	c	27	b	45	b
10	b	28	d	46	c
11	b	29	a	47	b
12	b	30	b	48	c
13	a	31	c	49	c
14	c	32	d	50	a
15	c	33	a	51	c
16	b	34	a	52	d
17	a				
18	a				