

UNIVERSITY OF ENGINEERING AND TECHNOLOGY
LOGY ENTRANCE EXAMINATION
MULTIPLE CHOICE QUESTIONS

TIME 1 HOUR

M.M. 50

1. Lactose operon of *Escherichia coli* is
 - a. Monocistronic
 - b. Inducible
 - c. Repressible
 - d. Both b and c
2. The terms *cistron*, *recon* and *muton* was proposed by
 - a. Johannsen
 - b. Morgan
 - c. Lederberg
 - d. Benzer
3. Coliphage x 174 possesses
 - a. Double stranded DNA
 - b. Double stranded RNA
 - c. Single stranded DNA
 - d. Single stranded RNA
4. In Operon model, RNA Polymerase binds to
 - a. Structural gene
 - b. Promoter gene
 - c. Regulator
 - d. Operator gene
5. Viroids differ from viruses in
 - a. Satellite RNA packaged with viral genome
 - b. Naked DNA molecules
 - c. Naked RNA molecules only
 - d. Naked DNA packaged with viral genome
6. Genetic material of retroviruses is
 - a. Single stranded RNA
 - b. Single stranded DNA
 - c. Double stranded RNA
 - d. Double stranded DNA
7. SOS Response is initiated by the-
 - a. Single stranded DNA
 - b. Cleavage of *recBCD* protein
 - c. Cleavage of *recA* protein
 - d. Cleavage of *lexA* protein
8. Transposon tagging is used to
 - a. Isolate a gene
 - b. Isolate a transposon
 - c. Study the sequence of genes
 - d. Study the characters coded by the gene
9. The frequency of spontaneous mutations is approximately
 - a. 10^{-6}
 - b. 10^{-9}
 - c. 10^{-3}
 - d. 10^{-12}
10. Which of the following acid is produced by incomplete oxidation rather than a true fermentation?
 - a. Gluconic acid
 - b. Acetic acid
 - c. Citric acid
 - d. Lactic acid
11. Haemoglobin is
 - a. Monomeric protein
 - b. Oligomeric protein
 - c. Chromoprotein
 - d. Both b and c.
12. Tryptophan is involved in the formation of
 - a. Haeme
 - b. Vitamin Niacin and Indole Acetic Acid
 - c. Hormones
 - d. Urea formation in liver
13. Starving person will first use
 - a. Fats
 - b. Blood protein
 - c. Muscle protein
 - d. Glycogen
14. Which of the amino acid is not utilized by brain?
 - a. Valine
 - b. Glycine
 - c. Methionine
 - d. Phenylalanine
15. Evolution of CO₂ is more than intake of oxygen when
 - a. Fats are respired
 - b. Glucose is respired
 - c. Sucrose is respired
 - d. Organic acids are respired
16. Cytochrome oxidase is poisoned by

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- white d. Sulphate
he
- a. Mitochondria b. Microsomes c. Nuclei d. Cytosol
18. Glyoxysomes are concerned with metabolism of
a. Proteins b. Fats c. Carbohydrates d. All of these
19. A plant cell placed in hypotonic solution will
a. Shrink b. Undergo plasmolysis c. Swell up and become turgid d. Swell up and burst
20. Abscisic acid controls
a. Stem elongation b. Cell expansion and cell wall plasticity c. Cell division d. Leaf fall and dormancy
21. Epigeal germination is shown by
a. Castor b. Mango c. Pea d. Gram
22. Chemotropic movement is shown by
a. Pollen tube b. Male gametes of bryophytes c. Coiling of young leaves
d. Drooping of *Mimosa* leaves
23. Z DNA is characterized by
a. Left handed helix b. Right handed helix c. Bending of nitrogen bases to helix and at an angle other than perpendicular d. Both a and c
24. Which one is involved in DNA repair?
a. Ligase b. Primase c. DNA Polymerase III d. DNA Polymerase I
25. RNA Polymerase is inhibited by
a. Rifampicin b. Actinomycin c. Both a and b d. None of these
26. The technique used to differentiate between sister chromatids is
a. Feulgen staining b. Acetocarmine c. Harlequin staining d. Northern blotting
27. X rays cause mutation by
a. Breaking spindle b. Rupturing nuclear membrane c. Changing the chromosome morphology d. Inducing karyokinesis
28. Linkage decreases frequency of
a. Recessive allele b. Dominant allele c. Hybridization d. Both b and c
29. Half of the patients with allergic diseases have increased serum
a. IgE levels b. IgD levels c. IgG levels d. IgM levels
30. The combining sites on the surface of the lymphocytes are antibody like molecules called
a. Antigen receptors b. Antigenic determinants c. Antibodies d. None of these
31. The enzyme used in footprinting technique is
a. Permease b. DNA ligase c. DNA polymerase d. RNA polymerase
32. Protoplast fusion can be achieved by
a. Electric current b. Sandi virus c. Polyethylene glycol d. pH and temperature shock
33. DNA staining is done by
a. Feulgen staining b. Giemsa staining c. Crystal violet d. Methylene blue
34. Which of the following phytohormone usually acts as bud inhibitor?
a. Gibberelin b. Cytokinin c. Zeatin d. Indole Acetic Acid
35. The determination of organogenesis in plant tissue culture depends upon



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Composition of media c. Polarity and growth

e

50. Somatic hybridization is a
a. Asexual hybridization b. Sexual hybridization c. Gamete fusion d. Syngamy
37. Antibody diversity is generated by
a. Protein splicing b. Somatic mutation c. Allelic exclusion d. Interchromosomal recombination
38. Efficient expression of a heterologous protein product is influenced by
a. Transcriptional efficiency b. Copy number of plasmid c. Codon bias d. All of these
39. For the growth of T cell, the growth factor needed would be
a. Epidermal growth factor b. Interleukin- 2 c. Fibroblast growth factor d. Tumor necrosis factor- α
40. Hybridoma cells are
a. Non anchorage dependent and cannot grow in suspension culture
b. Non anchorage dependent and can be grown in suspension culture
c. Anchorage dependent and can be grown in suspension culture
d. Anchorage dependent and cannot grow in suspension culture
41. Which of the following mice are used for immunization in the hybridoma technology?
a. Swiss mice b. Balb/c mice c. Outbred mice d. Indigenous mice
42. Blocking of active site of an enzyme is a kind of
a. Feedback inhibition b. Non competitive inhibition c. Allosteric inhibition
d. Competitive inhibition
43. Transferases are involved in the transfer of
a. Phosphate group b. Amino group c. Methyl group d. All of these
44. For the lysis of yeast cell wall, which enzyme is most commonly used?
a. Glucanases b. Protease c. Mannase d. All the three in combination
45. Which of the following is non-mechanical method for cell disruption?
a. Thermolysis b. Impingement c. Ultrasonication d. Milling
46. Volatile products can be separated by the process
a. Perstraction b. Pervaporation c. Permeation d. Precipitation
47. BLAST and FASTA are used for
a. Global similarity b. End free space alignment c. Local similarity d. Gap penalty
48. Which of the following is not primary nucleotide sequence database?
a. DDBI b. OWL c. GENBANK d. EMBL
49. Which step is omitted in whole genome sequencing?
a. Random shredding of genome b. Making phage library c. Computational analysis
d. None of these
50. Acetic acid is produced by
a. Genus *Gluconobacter* b. Members of the genus *Acetobacter* c. Both *Gluconobacter* and *Acetobacter* d. *Aspergillus* sp.



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- 2. D
- 3. C
- 4. B
- 5. C
- 6. A
- 7. D
- 8. A
- 9. A
- 10. B
- 11. D
- 12. B
- 13. D
- 14. B
- 15. D
- 16. A
- 17. B
- 18. B
- 19. C
- 20. D
- 21. A
- 22. A
- 23. A
- 24. D
- 25. C
- 26. C
- 27. C
- 28. C
- 29. A
- 30. A
- 31. D
- 32. C
- 33. A
- 34. D
- 35. D
- 36. A
- 37. C
- 38. D
- 39. B
- 40. B
- 41. B
- 42. D
- 43. D
- 44. D
- 45. A



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48. D

49. B

50. C

**ENGINEERING AND TECHNOLOGY
LOGY ENTRANCE EXAMINATION
SUBJECTIVE QUESTIONS**

MM 100

TIME 2 HOURS

Note- Attempt any two subsections from each question. All questions carry equal weightage. The answers should be to the point and precise.

1. a. Define vector. Briefly describe the various kinds of vector for cloning in *Escherichia coli*. 5
b. Briefly describe the procedure for construction of a genomic library and explain the strategy for isolation of a desired DNA from such a library. 5
c. What are DNA markers? Give a brief description of some important DNA markers and discuss their applications. 5

2. a. What is a chemical synthesis of DNA? List the various approaches for chemical synthesis of DNA. 5
b. Briefly describe the phosphate triester approach of DNA synthesis and enlist its advantages and limitations. 5
c. Discuss the application of PCR to production of cDNA. 5

3. a. Briefly describe the use of BLAST search tool. 5
b. What do you understand from SNP? How can SNP be useful for human health? 5
c. What benefits one may expect from genome sequencing projects? 5

4. a. Define animal cell culture. Outline the main features of animal cell culture. 5
b. What are serum-free media? Enlist advantages and limitations of such media. 5
c. Define primary cultures and cell lines. Briefly describe the origin, characteristics and maintenance of continuous cell lines. 5

5. a. What is vaccine and immunization? Explain the different approaches for virus vaccine production giving suitable examples. 5
b. What is a monoclonal antibody? Describe the production and applications of monoclonal antibodies. 5
c. Briefly outline the various steps in *in vitro* fertilization and discuss its advantages and limitations. 5

6. a. What are embryonic stem cells and how are they derived? 5
b. Describe main features of random and targeted gene integrations and the advantages and disadvantages associated with them. 5
c. Describe the techniques for identification and selection of transgenic animals. 5

7. a. What is drug targeting? Discuss the approaches for controlled drug delivery. 5

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- of gene silencing in transgenic plants. 5
- on. Briefly describe the various approaches for micropropagation and their advantages and limitations. 5
8. a. What is an enzyme reactor? Describe different types of enzyme reactors. 5
- b. What is an enzyme immobilization? Discuss some methods of enzyme immobilization. 5
- c. Discuss the role of proteases, glucose oxidase and catalase in food industry. 5
9. a. What are xenobiotic compounds? Describe the various types of recalcitrant xenobiotic compounds and the hazards from xenobiotics. 5
- b. What are energy crops? Describe the various methods of utilization of biomass as energy sources. 5
- c. Describe somatic hybrids and cybrids and their types and applications. 5
10. a. Define strain improvement and briefly discuss the various approaches used for strain improvement. 5
- b. Define a bioreactor. Explain major categories of fermentations according to process requirement. 5
- c. Define downstream processing. Briefly describe the various steps in downstream processing. 5