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ROLL No.

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TEST BOOKLET No.

228

TEST FOR POST GRADUATE PROGRAMMES

BIOTECHNOLOGY

Time: 2 Hours

Maximum Marks: 450

INSTRUCTIONS TO CANDIDATES

1. You are provided with a Test Booklet and an Optical Mark Reader (OMR) Answer Sheet to mark your responses. Do not soil the Answer Sheet. Read carefully all the instructions given on the Answer Sheet.
2. Write your Roll Number in the space provided on the top of **this page**.
3. Also write your Roll Number, Test Code, and Test Subject in the columns provided for the same on the **Answer Sheet**. Darken the appropriate bubbles with a **Ball Point Pen**.
4. The paper consists of 150 objective type questions. All questions carry equal marks.
5. Each question has four alternative responses marked **A, B, C** and **D** and you have to **darken** the bubble corresponding to the correct response fully by a **Ball Point Pen** as indicated in the example shown on the Answer Sheet.
6. Each correct answer carries 3 marks and each wrong answer carries 1 minus mark.
7. Space for rough work is provided at the end of this Test Booklet.
8. You should return the Answer Sheet to the Invigilator before you leave the examination hall. However, you can retain the Test Booklet.
9. Every precaution has been taken to avoid errors in the Test Booklet. In the event of any such unforeseen happening, the same may be brought to the notice of the Observer/Chief Superintendent in writing. Suitable remedial measures will be taken at the time of evaluation, if necessary.

SEAL



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BIOTECHNOLOGY

1. Foam production is more in medium containing
 - (A) Protein and peptides
 - (B) Amino acid
 - (C) Lipid and fats
 - (D) Carbohydrate

2. Louis Pasteur established the modern era of food microbiology in 1957 when he showed that microorganisms cause spoilage in
 - (A) beer
 - (B) wine
 - (C) juice
 - (D) milk

3. HTST pasteurisation stands for
 - (A) high time slow treatment
 - (B) high temperature slow treatment
 - (C) high temperature short time
 - (D) high thermal slow time

4. Lichen is the symbiotic association of
 - (A) fungi and bacteria
 - (B) fungi and algae
 - (C) algae and bacteria
 - (D) protozoa and virus

5. In root nodules of legumes, leg-haemoglobin is important because it
 - (A) transports oxygen to the root nodule
 - (B) acts as an oxygen scavenger
 - (C) provides energy to the nitrogen
 - (D) acts as a catalyst in transamination

6. Which of the following is used as a bioweapon?
 - (A) *Bacillus subtilis*
 - (B) *Bacillus licheniformis*
 - (C) *Bacillus thuringiensis*
 - (D) *Bacillus anthracis*

7. The transgenic 'Golden rice' has been developed for increased content of
- (A) Vitamin A (B) Vitamin B1
(C) Vitamin C (D) Vitamin D
8. PCR proceeds in three distinct steps governed by temperature. They are in order of
- (A) denaturation, annealing, synthesis
(B) synthesis, annealing, denaturation
(C) annealing, synthesis, denaturation
(D) denaturation, synthesis, annealing
9. Which of following mineral nutrients plays an important role in biological nitrogen fixation?
- (A) Zinc (B) Iron
(C) Molybdenum (D) Magnesium
10. *Aedes aegypti* is a vector for
- (A) both dengue and yellow fever
(B) dengue fever
(C) yellow fever
(D) Japanese encephalitis
11. Which category of hypersensitivity best describes hemolytic disease of the newborn caused by Rh incompatibility?
- (A) Atopic or anaphylactic (B) Cytotoxic
(C) Immune complex (D) Delayed
12. A child stung by a bee experiences respiratory distress within minutes and lapses into unconsciousness. This reaction is probably mediated by
- (A) IgE antibody (B) IgG antibody
(C) Sensitised T cells (D) IgM antibody



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13. Complement fixation refers to
- (A) the ingestion of C3b-coated bacteria by macrophages
 - (B) the destruction of complement in serum by heating at 56°C for 30 minutes
 - (C) the binding of complement components by antigen-antibody complexes
 - (D) the interaction of C3b with mast cells
14. A regulatory body working under MoEF for the release of transgenic crops is
- (A) NBPGR
 - (B) GEAC
 - (C) NSC
 - (D) NIPGR
15. When the conditions are dry, a grass leaf curls inward to minimize water loss due to presence of
- (A) thick cuticle
 - (B) large xylem cavities
 - (C) parallel venation
 - (D) bulliform cells
16. Aggregates of lymphoid tissue present in the distal portion of the small intestine are known as
- (A) Villi
 - (B) Peyer's patches
 - (C) Rugae
 - (D) Choroid plexus
17. Which of the following extracellular enzymes produced by Group A streptococci is called "spreading factor", an enzyme important in skin and soft tissue infection?
- (A) Streptokinase
 - (B) Hyaluronidase
 - (C) M Protein
 - (D) Deoxyribonuclease C
18. What is the O antigen of Enterobacteriaceae?
- (A) Cell surface polysaccharide
 - (B) A flagellar protein
 - (C) A peptidoglycan matrix important for cellular rigidity
 - (D) Cell wall lipopolysaccharide



19. Movement of DNA from one bacteria to another through a tubular bridge or pilus is known as
- (A) conjugation (B) transposition
(C) transfection (D) transduction
20. *Helicobacter pylori* is
- (A) the presumed cause of colon cancer
(B) the cause of most cases of acute food poisoning in the U.S.
(C) the cause of about 90% of peptic ulcers in the U.S.
(D) urease negative
21. What effect does a concentrated urea solution have on proteins?
- (A) It reacts with and labels the N-terminal amino acid
(B) It causes disulfide bonds to be reduced
(C) It causes polypeptides to fold properly
(D) Causes weakening of hydrophobic interaction and protein unfolding
22. Bacterial ribosomes do not have the following
- (A) 18S RNA (B) 16S RNA
(C) 5S RNA (D) Two sub units
23. Proteins are "tagged" for degradation by cytosolic proteasomes through the covalent attachment of
- (A) Ubiquitin (B) Glutathione
(C) Glucose (D) Clathrin
24. RNA molecules that exhibit catalytic activity are called
- (A) mRNAs (B) Ribonucleases
(C) Ribozymes (D) Ribosomes



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25. Which of the following amino acids does not contribute to fluorescence of a protein?
- (A) Tyrosine (B) Cysteine
(C) Phenylalanine (D) Tryptophan
26. Which of the following cannot be classified as a weak interaction?
- (A) Van der Waals force (B) Peptide Bond
(C) Hydrogen bonds (D) Ionic interaction
27. To promote attachment and spreading of anchorage dependent animal cells, the surface of the culture vessel needs to be coated with
- (A) Trypsin (B) Pronase
(C) Collagen (D) Polyglycol
28. The synthetic antibiotic ampicillin acts by preventing
- (A) ribosome assembly
(B) the binding of tRNA to the ribosome
(C) cell wall synthesis
(D) elongation of translation of proteins
29. Which of the following is not an artificial sweetener?
- (A) Aspartame (B) Sorbitol
(C) Fructame (D) Neotame
30. What is the full form of HEPA filter?
- (A) High Efficiency Particulate Air Filter
(B) Highly Effective Particulate Air Filter
(C) Highly Efficient Particle Aerosol Filter
(D) High Efficiency Purifying Air Filter



31. Fragile X syndrome is caused due to
- (A) deletion in the X chromosome
 - (B) inversion at the p-arm of the X chromosome
 - (C) translocation between X chromosome and Chromosome 21
 - (D) duplication in the X chromosome
32. Turner's syndrome is caused due to
- (A) gain of autosome
 - (B) gain of sex chromosome
 - (C) loss of autosome
 - (D) loss of sex chromosome
33. A child had difficulty in breathing and was suspected of having severe asthma. An elevated number of which cells in a routine blood panel might support this diagnosis?
- (A) Eosinophils
 - (B) Basophils
 - (C) Neutrophils
 - (D) Monocytes
34. Haemozoin is a toxin, which is produced in human blood during
- (A) *Plasmodium* infection
 - (B) *Leishmanial* infection
 - (C) *Trypanosomal* infection
 - (D) *Entamoeba histolytica* infection
35. Which of the following staining techniques is used to check viability of cells?
- (A) Gram's staining
 - (B) Giemsa staining
 - (C) Trypan blue staining
 - (D) Coomassie staining
36. Plasmids in native condition exist as
- (A) supercoiled
 - (B) linear
 - (C) sometimes single stranded
 - (D) closed nick circular



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37. Blue-white screening of recombinant clones is based on the activity of following enzyme
- (A) β -galactosidase (B) Trans acetylase
(C) α -amylase (D) Alkaline phosphatase
38. Molecular weight of 1 base pair in DNA is
- (A) 660 Da (B) 330 Da
(C) 1320 Da (D) 1000 Da
39. Biotechnologically synthesized human insulin is called as
- (A) Insulin A (B) Insulin B
(C) Humulin A (D) Humulin
40. Enzymes used in detergents are
- (A) proteases (B) amylases
(C) lactases (D) rennet
41. Sarcoma is cancer of
- (A) skin (B) bones
(C) connective tissue/organ (D) blood
42. Sickle cell anemia is due to
- (A) deficiency of iron in blood
(B) a genetically determined defect in β -chain of Hb
(C) a genetically determined defect in the α -chain of Hb
(D) deficiency of vitamin B
43. Surgical removal of gall bladder in man, would lead to
- (A) impairment of digestion of fat
(B) impairment of digestion of proteins
(C) jaundice
(D) kidney disease

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44. Which of the following diseases of blood is hereditary in nature?
- (A) Thalassemia (B) Pernicious anemia
(C) Megaloblastic anemia (D) Galactosemia
45. The pituitary gland's posterior lobe produces two hormones such as
- (A) vasopressin and oxytocin
(B) cortisone and corticosterone
(C) progesterone and estradiol
(D) testosterone and andosterone
46. Adrenal gland is
- (A) mesodermal in origin (B) ectodermal in origin
(C) endo-mesodermal in origin (D) ecto-mesodermal in origin
47. The Taq DNA polymerase, which is used in the PCR to amplify a DNA sequence lacks
- (A) 5'-3' polymerase activity (B) 3'-5' exonuclease activity
(C) both (A) and (B) (D) polarity
48. The analysis of a gene reveals that 30% of the nucleotides are G residues. Then what is the percentage value for A?
- (A) 10% (B) 20%
(C) 30% (D) 40%
49. Gene probe labeling using random priming uses combinations of oligonucleotides 6 bp in length. Calculate the number of possible random combinations if all four nucleotides are included
- (A) 4^6 (B) 6^4
(C) 4×6 (D) 6^6
50. Feed back inhibition is due to accumulation of
- (A) end products (B) substrate
(C) enzymes (D) enzyme-substrate complex



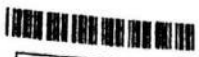
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51. In plasmid DNA isolation GTE (Glucose, Tris, EDTA) solution is used for
- (A) maintaining the tonicity of the cell
 - (B) denaturation of the DNA
 - (C) lysing the cell
 - (D) renaturation of the plasmid DNA
52. 'WIDAL' test is used to diagnose
- (A) Typhoid
 - (B) Amoebic dysentery
 - (C) Hepatitis B
 - (D) Diphtheria
53. The growth of a bacterial culture can be monitored by reading the optical density (OD) at 600nm, the one OD unit corresponds to
- (A) 10^9 cells/ml
 - (B) 10^{12} cells/ml
 - (C) 10^6 cells/ml
 - (D) 10^{15} cells/ml
54. Which of the following techniques can be used as an alternative to the Northern hybridisation?
- (A) Reverse Transcription PCR (RT-PCR)
 - (B) Southern hybridisation
 - (C) Western blot
 - (D) DNA sequencing
55. The primary function of gap junctions between cell membranes is to
- (A) integrate the metabolic or electrical activity of a group of cells through permeable channels
 - (B) allow all surfaces of a functional unit of cells to contact the extracellular matrix
 - (C) permit the exchange of genetic information between adjacent cells
 - (D) reinforce the structural cohesion of cells that form a particular tissue

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56. What is the role of helper T cells in the function of the human immune system?
- (A) To lyse and destroy infected cells for removal from the body
 - (B) To generate B cells for the production of antibodies
 - (C) To mobilise both the humoral and cell-mediated responses to antigens
 - (D) To distinguish an antigen from a normally occurring substance in the body
57. Which of the following correctly explains how a favorable genetic trait can increase in frequency in a population?
- (A) Lamarck's principle
 - (B) Natural selection
 - (C) Adaptive radiation
 - (D) Genetic recombination
58. A mutation resulting in the inability to make or to utilize coenzyme Q would most directly affect the
- (A) oxidative decarboxylation of pyruvate
 - (B) conversion of glucose to pyruvate
 - (C) transport of oxygen in the blood
 - (D) transport of electrons from malate to oxygen
59. A change in the pattern of gene expression without a change in the DNA sequence is called
- (A) chemical carcinogen
 - (B) epigenetic
 - (C) mutagenesis
 - (D) tumor progression
60. Which of the following is antituberculosis?
- (A) Actinomycin
 - (B) Rifamycin
 - (C) Chloramphenicol
 - (D) Natamycin



- 61. Phytoalexins are
 - (A) antimicrobial compounds produced by plants
 - (B) allergic compounds of plant origin
 - (C) toxic metabolites produced by plants
 - (D) plant growth factors

- 62. Antigenic determinant of human blood group antigens is
 - (A) Carbohydrate
 - (B) Lipid
 - (C) Polypeptide
 - (D) Amino acid

- 63. In a RNA-DNA hybrid some loops were visible. This indicates that
 - (A) the gene has undergone a frame shift mutation
 - (B) the mRNA is polycistronic
 - (C) the mRNA is edited
 - (D) the gene contains introns

- 64. The buffering capacity of a buffer will be maximum when the pH is
 - (A) lower to the pKa value
 - (B) higher to the pKa value
 - (C) very close to the pKa value
 - (D) pH of the buffer is independent of its pKa value

- 65. Electron flow in cytochrome oxidase in the respiratory chain can be blocked by
 - (A) Rotenone
 - (B) Cycloheximide
 - (C) Cyanide
 - (D) Amytal

- 66. In humans, passive immunity observed in newborn child is due to the passage of the following immunoglobulin from the mother to the child through placenta.
 - (A) IgD
 - (B) IgE
 - (C) IgM
 - (D) IgG

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67. Telomerase is an enzyme whose macro molecular composition is
- (A) lipoprotein only (B) ribonucleoprotein only
(C) ribonucleic acid only (D) protein only
68. Choose the group containing only the peptide hormones.
- (A) Vasopressin, Oxytocin and Epinephrine
(B) Vasopressin, Testosterone and Glucagon
(C) Vasopressin, Oxytocin and Thyroxine
(D) Oxytocin, Vasopressin and Somatostatin
69. The organism which Robert Koch first used to propose Koch's postulates was
- (A) *Mycobacterium tuberculosis*
(B) *Salmonella typhimurium*
(C) *Bacillus anthracis*
(D) *Klebsiella pneumonia*
70. Blast cells are
- (A) precursors of mature cells (B) cells that blast
(C) transformed cells (D) enucleated cells
71. The main constituents of plasma proteins are
- (A) Heparin (B) Fibrinogen
(C) Globulin (D) Albumins
72. Klenow fragment has
- (A) 5'→3' Exonuclease activity
(B) RNase H activity
(C) 3'→5' Exonuclease activity
(D) Template independent polymerase activity

73. Pulse field gel electrophoresis can separate
- (A) negatively charged proteins
 - (B) positively charged proteins
 - (C) chromosomes
 - (D) plasmids
74. A competitive inhibitor
- (A) increases the K_m of an enzyme
 - (B) decreases the K_m of an enzyme
 - (C) increases both the V_{max} and the K_m of an enzyme
 - (D) decreases the K_m but increases the V_{max} of an enzyme
75. Inheritance of mitochondrial DNA is
- (A) maternal
 - (B) paternal
 - (C) from both parents
 - (D) None of the above
76. Wobble pairing occurs between
- (A) first base in the codon and third base in the anti-codon
 - (B) second base in codon and anti-codon
 - (C) first base in the anti-codon and the third base in the codon
 - (D) None of the above
77. Shine-Dalgarno sequence is
- (A) amino acid sequence
 - (B) present in eukaryotic mRNA
 - (C) absent in prokaryotes
 - (D) recognition sequence for 16s rRNA absent in prokaryotes
78. Glycolytic Pathway occurs in
- (A) Mitochondrial matrix
 - (B) Intermembrane space
 - (C) Nucleus
 - (D) Cytosol

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79. Hormone responsible for production of RBC is
- (A) Adrenalin (B) Rbcin
(C) Erythropoitein (D) GSH
80. The largest immunoglobulin with a molecular weight of 900KD is
- (A) IgM (B) IgG
(C) IgA (D) IgE
81. Ramachandran Plot describes which of the following?
- (A) Protein Primary Structure
(B) Protein Secondary Structure
(C) Protein Tertiary Structure
(D) Protein Quaternary Structure
82. Which phytohormone is used for artificial ripening of fruit?
- (A) Auxin (B) NAA
(C) Zeatin (D) Ethylene
83. *Bt* cotton is resistant to
- (A) Insects (B) Bacteria
(C) Virus (D) Rodents
84. A gyanandromorph is a
- (A) Male (B) Female
(C) Both male and female (D) None of the above
85. In which stage of Prophase I of Meiosis I the crossing over occurs?
- (A) Zygotene (B) Pachytene
(C) Diplotene (D) Leptotene

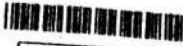


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86. *E. coli* alternates between tumbling and swimming behavior by reversing the rotation of one of the following appendages
- (A) Cilia (B) Flagella
(C) Pili (D) Pseudopodia
87. Which of the following is an 'extinct' species?
- (A) Gharial (B) Polar bear
(C) Dodo (D) Snow leopard
88. Which of the following is an example of submerged rooted hydrophytes?
- (A) *Azolla* (B) *Hydrilla*
(C) *Typha* (D) *Salvinia*
89. The best test of the relatedness of two species is in the similarity of their
- (A) anatomy (B) DNA and proteins
(C) development (D) courtship behaviour
90. A symbiotic association of photosynthetic algae and fungi is called as
- (A) Lichens (B) Mycorrhiza
(C) Thallophyta (D) Hairy root
91. *Chlamydomonas* is an example of
- (A) Red algae (B) Green algae
(C) Brown algae (D) Blue green algae
92. African sleeping sickness is caused by
- (A) *Giardia lamblia* (B) *Trichomonas vaginalis*
(C) *Trypanosoma brucei* (D) *Leishmania donovani*

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93. Which of the following is not directly related to gene regulation?
(A) Acetylation of histones (B) Methylation of DNA
(C) Alternative splicing (D) Activation of caspases
94. The SOS repair mechanism is activated by
(A) 5-Bromouracil (B) 2-Aminopurine
(C) Hydroxylamine (D) Thymine dimer
95. Whooping cough is caused by
(A) *Clostridium botulinum* (B) *Bacillus anthracis*
(C) *Bordetella pertussis* (D) *Clostridium tetane*
96. DNA of bacteria is not cleaved by its own restriction enzymes because the recognition DNA sequences are
(A) methylated
(B) deleted
(C) bound by inhibitory protein
(D) not accessible to restriction enzyme
97. In prokaryotes, during lagging strand synthesis, the primers are removed by
(A) 3' to 5' exonuclease (B) DNA ligase
(C) DNA polymerase I (D) DNA polymerase III
98. Basic dye crystal violet stains
(A) only Gram positive bacteria
(B) only Gram negative bacteria
(C) both Gram positive and negative bacteria
(D) mycoplasma
99. *Chlamydomonas nivalis* is an example of
(A) Psychrophile (B) Thermophile
(C) Psychrotroph (D) Hyperthermophile



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100. Tetracyclin binds with
- (A) Bacterial DNA gyrase (B) 16S rRNA
(C) Bacterial cell membrane (D) A site of ribosome
101. Which of the following viral family has RNA as the genetic material?
- (A) Parvoviridae (B) Adenoviridae
(C) Poxviridae (D) Orthomyxoviridae
102. Host cell receptor for influenza virus is
- (A) Heparan sulphate (B) CD4
(C) Acetylcholine receptor (D) Sialic acid
103. The structure of HIV-1 is
- (A) icosahedral (B) helical
(C) complex (D) round
104. Which of the following is a double stranded DNA virus?
- (A) Hepatitis A (B) Hepatitis B
(C) Hepatitis C (D) Hepatitis D
105. Which of the following diseases is caused by prion?
- (A) Syphilis (B) Measles
(C) Anthrax (D) Creutzfeldt-Jacob
106. In the exponential phase of growth of a bacterial culture, 100cfu/ml cells increased to 3200 cfu/cells in 2 hours. What is the generation time for this bacterium?
- (A) 12 minutes (B) 24 minutes
(C) 15 minutes (D) 30 minutes

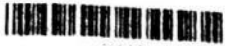
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107. A prophage is
- (A) an auxotrophic mutant
 - (B) a gene
 - (C) a phage DNA incorporated into the host genome
 - (D) the DNA of lytic phage
108. An organism that requires complex nutrient molecules, such as glucose, as a source of energy and carbon is called a
- (A) auxotroph
 - (B) heterotroph
 - (C) phototroph
 - (D) chemotroph
109. The drug used for the treatment of HIV is
- (A) Tetracycline
 - (B) Vancomycine
 - (C) AZT
 - (D) Ampicycline
110. Unit of distance between genes on the chromosomes is
- (A) Picometer
 - (B) Centimorgan
 - (C) Morgan
 - (D) Centidalton
111. The ratio of volume of RBCs to plasma is expressed as
- (A) Hematocrit
 - (B) Hematin
 - (C) ESR
 - (D) Heme percentage
112. The segment of DNA which participates in crossing over is known as
- (A) Recon
 - (B) Muton
 - (C) Cistron
 - (D) Replicon
113. Which of the following is an example of an oncogenic virus?
- (A) Herpes zoster
 - (B) HIV-2
 - (C) Epstein-Barr virus
 - (D) Vesicular stomatitis virus



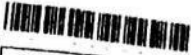
114. Antibodies are
- (A) Proteins (B) Glycoproteins
(C) Lipoproteins (D) Carbohydrates
115. The hypervariable region of an antibody lies in the
- (A) N-terminal region of light chain
(B) N-terminal region of light and heavy chain
(C) C-terminal region of light chain
(D) C-terminal region of heavy and light chain
116. In cervical cancer a vaccine against one of the following is useful
- (A) Epstein-Barr virus (B) Human papilloma virus
(C) Adeno virus (D) HTLV-1
117. Disaggregation of cells can be achieved by all of the following except
- (A) physical disruption
(B) enzymatic digestion
(C) treatment with chelating agents
(D) hypotonicity
118. Accumulation of lactate in cell culture medium leads to
- (A) increase in pH of the medium
(B) reduction in pH of the medium
(C) no change in pH
(D) cell proliferation
119. The first vaccine developed from animal cell culture is
- (A) Polio vaccine (B) Influenza vaccine
(C) Rabies vaccine (D) Small pox vaccine

120. In a freezing medium, used for long term preservation of cells, which of the following is used as a cryoprotectant?
- (A) Dimethyl fluoride (B) Dimethyl sulfoxide
(C) Diethyl sulfoxide (D) Diethyl fluoride
121. Which of the following inhibits the formation of contractile microfilament?
- (A) Colchicin (B) Cytochalasin-B
(C) Staurosporin (D) Rapamycin
122. Which of the following is not a fluorescent stain for nucleic acids?
- (A) DAPI (B) Hoechst
(C) Silver stain (D) Ethidium bromide
123. Permease, a carrier protein present in plasma membrane is involved in
- (A) Uniport (B) Symport
(C) Antiport (D) Active transport
124. The gene transfer technique involving the use of a fatty bubble to carry a gene into a somatic cell is
- (A) Electroporation (B) Liposome transfer
(C) Microinjection (D) Particle bombardment
125. A cDNA includes
- (A) codons for a mature mRNA
(B) sequences corresponding to promoters
(C) sequences corresponding to introns
(D) sequence corresponding to a gene
126. What type of enzyme is used in recombinant DNA technology to split a specific sugar phosphate bond in each strand of a DNA double helix?
- (A) Esterase (B) Restriction enzyme
(C) Lipase (D) Ligase



127. RFLP and VNTR Probes are some of the terminologies associated with
- (A) Hybridoma technology (B) Tissue culture
(C) DNA finger printing (D) DNA sequencing
128. Which of the following is an example of an autonomously replicating mini chromosome?
- (A) Virus (B) Phage
(C) Plasmid (D) Transposon
129. Expression vectors are those that
- (A) produce protein products
(B) are used for genomic libraries
(C) are used for chromosome synthesis
(D) are used for finger printing
130. A clone is a group of organisms produced by
- (A) asexual method and genetically similar
(B) asexual method and genetically dissimilar
(C) sexual method and genetically similar
(D) sexual method and genetically dissimilar
131. Which of the following groups of enzymes is popularly called "Molecular stichers"?
- (A) Restriction Endonucleases (B) Ligases
(C) RNA polymerases (D) DNA polymerases
132. Proteins that assist in the binding of RNA polymerase to the promoter region on DNA strand are called
- (A) Transcription factors (B) SSB proteins
(C) Sigma factors (D) RNA-binding proteins

133. Which of the following is not needed for DNA transcription?
- (A) Ribosomes (B) Nucleotides
(C) DNA (D) Enzymes
134. The normal human chromosome diploid number is
- (A) 23 (B) 24
(C) 46 (D) 48
135. In meiosis, recombination occurs in
- (A) Metaphase I (B) Prophase I
(C) Metaphase II (D) Prophase II
136. In a Robertsonian translocation fusion occurs at the
- (A) Telomeres (B) Centromeres
(C) Histones (D) Ends of the long arms
137. Repeat core sequences consisting of 2, 3, or 4 base pairs are known as
- (A) Single nucleotide polymorphisms (SNPs)
(B) Microsatellites
(C) Minisatellites
(D) Satellites
138. Enzymes work by lowering the
- (A) activation energy (B) binding energy
(C) chemical energy (D) potential energy
139. Which of the following enzymes is not regulated in glycolysis?
- (A) Hexokinase
(B) Phosphofruktokianse
(C) Glyceralde-3-phosphate dehydrogenase
(D) Pyruvate kinase



140. The net yield of ATP from conversion of glucose to pyruvate in glycolysis by substrate level phosphorylation is
- (A) 2 (B) 4
(C) 1 (D) 6
141. Which one of the following TCA cycle enzymes is membrane bound?
- (A) Succinate dehydrogenase (B) Malate dehydrogenase
(C) Citrate synthase (D) Pyruvate dehydrogenase
142. Two restriction enzymes which recognise the same restriction site are called
- (A) Isoschizomers (B) Neoschizomers
(C) Isozymes (D) Homozygote
143. Which one of the following is not a desirable feature of a good vector for genetic engineering?
- (A) Low copy number (B) Selectable marker
(C) Unique restriction sites (D) Origin of replication
144. The most commonly used enzyme for selection of transformants in *E. coli* is
- (A) β -galactosidase (B) α -galactosidase
(C) cytochrome oxidase (D) β -glucosidase
145. Polymerase chain reaction would be inhibited in the absence of which of the following ions?
- (A) Na^+ (B) Mg^{2+}
(C) Mn^{2+} (D) K^+

146. During which phase of cell cycle, histones are synthesised?
- (A) M- phase (B) S- phase
(C) G1- phase (D) G2-phase
147. Sendai virus enters host cell by
- (A) Endocytosis
(B) Phagocytosis
(C) Cell fusion
(D) Receptor mediated endocytosis
148. Glycosylation of proteins occurs in
- (A) ER (B) Golgi
(C) Mitochondria (D) Nucleus
149. Initiation of hematopoiesis in adults occurs in
- (A) Liver (B) Bone marrow
(C) Kidney (D) Spleen
150. Actinomycin -D is an inhibitor of
- (A) respiration (B) photosynthesis
(C) protein synthesis (D) transcription
