

Admit Card No.



## **ST. ANTHONY'S COLLEGE, SHILLONG**

### **ENTRANCE TEST FOR ADMISSION TO M.Sc (BIOTECHNOLOGY) 2007**

### **Part A**

**DATE** : **24 May 2007**  
**TIME** : **10:00 am**  
**DURATION** : **2 hours**

#### **INSTRUCTIONS**

- ☞ This test has two parts. Part A comprises of 150 questions and is to be answered on the answer sheet provided. Part B comprises of 50 questions, which are to be answered on the question paper itself.
- ☞ The candidate is to answer as many questions as possible in the time that is allotted for this test
- ☞ For questions in Part A, each correct answer carries one mark. For each wrong answer 0.5 mark will be deducted. For questions in Part B, each correct answer carries two marks and for each wrong answer 1.0 mark will be deducted.
- ☞ Make sure that you have entered the number in the admit card in the place provided in the answer sheet.
- ☞ Please preserve your admit cards. They will be required at the time of admission.
- ☞ The names of those shortlisted for admission on the basis of the Entrance test will be published on the College notice board and College Website by 1.00 pm on 26th May, 2007. The shortlisted candidates will be required to attend an interview which will take place on 30th May, 2007. The list of those selected for admission based on the Entrance Test and the Interview will be published on the College notice boards and the College website on 4th June, 2007.

## Part A

Directions : Choose the best answer in each of the following and mark the same with a cross (X) in the appropriate box on the answer sheet.

- The amount of DNA present in a cell
  - increases sharply during the period before onset of cell division.
  - is at a constant level during the life of a cell.
  - continues to increase during meiosis.
  - increases immediately after mitosis is completed.
- Which of the following chromosomal aberrations involve no change in the overall amount of genetic material?
  - Duplication
  - Amplification
  - Inversion
  - Deletion
- Which of the following is an enzyme used to form a phosphodiester bond in a nick between a 3' end of one DNA chain and a 5' end of another?
  - DNA ligase
  - DNA polymerase
  - SI nuclease
  - Phosphodiesterase
- If a man of blood group AB marries a woman of blood group A whose father was of blood group O, what different blood groups can the children of this man and woman belong to?
  - AA, AB and AO
  - AA, AB, AO and BO
  - AA, AB and BO
  - AB, AO and BO
- Exposure of a photographic film to DNA labeled with a radioactive isotope is called
  - autoradiography
  - photography
  - radiation
  - scanning
- The classical 1957 experiment of Meselson & Stahl was concerned with
  - mode of DNA replication
  - polymerase chain reaction
  - synthesis of hybrid proteins
  - transduction via lambda phage
- The metabolic reactions constituting glycolysis is also known as
  - Embden-Meyerhoff-Parnas pathway
  - Calvin cycle
  - Kreb's cycle
  - Etner-Duodoroff pathway
- Which enzyme of the glycolytic pathway catalyzes the reaction that marks the transition from the 6C sugar phase to the 3C sugar phase
  - hexokinase
  - phosphofructokinase
  - phosphohexoseisomerase
  - aldolase
- The citric acid cycle accounts for the major portion of carbohydrate, fatty acid and amino acid oxidation and generates numerous biosynthetic precursors and is therefore
  - anabolic
  - catabolic
  - anaplerotic
  - amphibolic
- Cytochrome oxidase of the mitochondrial respiratory chain catalyzes reduction of  $O_2$  to yield
  - $H_2O$
  - $CO_2$
  - $C_6H_{12}O_6$
  - $H_2O_2$
- Uncoupling of oxidative phosphorylation in mitochondria generates
  - entropy
  - free energy
  - heat
  - ATP
- Pentose phosphates required for synthesis of nucleotides is supplied by
  - glycolytic pathway
  - hexose monophosphate shunt
  - gluconeogenesis
  - glycogenesis
- The longest portion of the bacterial flagellum is called the
  - Filament
  - Fimbriae
  - Basal body
  - Hook
- In protozoa the following is involved in recombination
  - macronucleus
  - micronucleus
  - vacoules
  - cytostome
- Lichen is an example of
  - mutualism
  - commensalism
  - amensalism
  - protoco-operation
- Syphilis is caused by
  - Treponema pallidum*
  - Clostridium tetani*
  - Campylobacter jejuni*
  - none of these

17. The glass or quartz container used in spectrophotometry is called a  
 a) cullete  
 b) cuvette  
 c) cutette  
 d) none of these
18. SDS-PAGE separates proteins based only on their  
 a) density  
 b) charge  
 c) mass  
 d) function
19. pH plays a role in determining the charge of proteins and amino acids due to a factor called  
 a) iso-pH point  
 b) isoelectric point  
 c) iso-ionic point  
 d) none of these
20. Which of the following lacks a nucleus?  
 a) Flame cell  
 b) Spermatozoan  
 c) Red blood corpuscle in man  
 d) White blood cell
21. Histone proteins are  
 a) acidic in nature  
 b) basic in nature  
 c) both acidic and basic in nature  
 d) hydrophobic
22. The sedimentation coefficient of a molecule is related to its  
 a) size alone  
 b) size and density  
 c) size, shape and density  
 d) none of these
23. The electron transport chain is in the  
 a) nucleus  
 b) outer mitochondrial membrane  
 c) inner mitochondrial membrane  
 d) lysosomes.
24. Genes are found in  
 a) the repetitive regions of a genome  
 b) the non-repetitive regions of a genome .  
 c) the regulatory regions of a genome  
 d) the entire region of a genome.
25. Which of the following describes the C-value paradox?  
 a) genome complexity is dependent on genome size.  
 b) genome complexity does not always correlate with genome size.  
 c) large genomes are always complex.  
 d) small genomes are most complex.
26. Which of the following is used for screening of genetic diseases?  
 a) RAPD  
 b) SINEs  
 c) LINEs  
 d) RFLP.
27. What is the size of the mammalian genome?  
 a)  $1 \times 10^9$  bps  
 b)  $2 \times 10^9$  bps  
 c)  $3 \times 10^9$  bps  
 d)  $3 \times 10^6$  bps
28. Which of the following is an approach used for genome sequencing?  
 a) The shotgun method  
 b) Fluorescent *in situ* hybridization  
 c) Chromosome jumping  
 d) Genomic library screening
29. RNA instability in alkaline solutions is due to  
 a) Adenine  
 b) Ribose  
 c) Uracil  
 d) Guanine
30. At the interphase stage of the cell cycle, some regions of the chromatin appear tightly coiled and are stained very densely by the Feulgen stain. These regions are called  
 a) Euchromatin  
 b) Heterochromatin  
 c) Chromatin  
 d) Chromomeres
31. Cells of the immune system that secrete antibodies are known as  
 a) B cells  
 b) B lymphocytes  
 c) Epithelial cells  
 d) Plasma cells
32. Blood tissue devoid of RBC is called  
 a) Plasma  
 b) Serum  
 c) Lymph  
 d) Ascites
33. A substance which binds to antibodies or T cell receptors but which cannot induce an immune response is called  
 a) Immunogen  
 b) Pathogen  
 c) Antigen  
 d) Foreign material
34. The class of antibody which is involved in hypersensitivity is  
 a) Ig E  
 b) IgD  
 c) IgA  
 d) IgM

35. The set of closely linked genes whose products are vital in T-cell mediated immune response are called
- T cell receptor
  - B cell receptor
  - Globin genes
  - Major Histocompatibility Complex
36. The Philadelphia chromosome is a result of translocation between
- Chromosome 9 and Chromosome 17
  - Chromosome 9 and Chromosome 10
  - Chromosome 9 and Chromosome 12
  - Chromosome 9 and Chromosome 22
37. When DNA isolated from a eukaryotic organism is centrifuged in a cesium chloride density gradient, two bands of DNA are formed- a major band and a minor band, above the major band. The minor band is called
- Satellite DNA
  - Plasmid DNA
  - Mitochondrial DNA
  - Chloroplast DNA
38. 2-aminopurine (2-AP) is a base analog of
- Thymine
  - Cytosine
  - Adenine
  - Guanine
39. Which of the following statements is correct?
- One X chromosome is inactivated early in the development of female mammals.
  - Both X chromosomes remain active in female mammals.
  - The X chromosome is inactivated early in the development of male mammals.
  - Only the X chromosome is active in male mammals.
40. In bacteria, the ability to transfer DNA by conjugation is dependent on
- The presence of plasmid DNA
  - The presence of fertility factor, F
  - The presence of RecA protein
  - The presence of infectious particles
41. Which of the following statements is correct?
- protein folding takes place in the smooth endoplasmic reticulum.
  - protein folding takes place in the rough endoplasmic reticulum.
  - protein synthesis takes place in the smooth endoplasmic reticulum.
  - detoxification takes place in the rough endoplasmic reticulum.
42. Autophagy is a function of
- ribosomes
  - centrosomes
  - mitochondria
  - lysosomes
43. HeLa cells are used in a variety of research. What are HeLa cells?
- These are cancer cells cultured in cancer research laboratories.
  - They are derivatives of a cancerous cervical tumor.
  - They are cancer cells removed from a woman, Henrietta Lacks.
  - All the above are correct.
44. What is the molarity of a solution containing 0.5 gm of NaOH dissolved in 500 ml solution ?
- 0.010M
  - 0.015 M
  - 0.020 M
  - 0.025M
45. If  $\Delta E$  is change in internal energy, Q is heat absorbed and W is work done, then according to the first law of thermodynamics,
- $\Delta E = Q - W$
  - $\Delta E = Q + W$
  - $\Delta E = ?Q + ?W$
  - $\Delta E = ?Q + W$
46. A zero order reaction is one
- whose rate is affected by concentration
  - in which concentration of the reactants does not change with time
  - in which reactants do not react
  - in which one of the reactants is in large excess
47. Isomers which can be interconverted through rotation around a single bond are
- Conformers
  - Diastereomers
  - Enantiomers
  - Positional isomers
48. The C-H bond is longest in
- $C_2H_2Br_2$
  - $C_2H_2$
  - $C_2H_4$
  - $C_2H_6$
49. Which of the following antibiotics inhibits protein synthesis in bacteria by blocking the A-site in the ribosome, inhibiting the binding of amino-acyl tRNAs
- Cycloheximide
  - Streptomycin
  - Penicillin
  - Tetracyclin
50. The process by which double stranded DNA is known to convert to the single stranded form by the application of heat is called
- Separation
  - boiling
  - melting
  - bubble formation

51. Which statement below is correct?
- During transcription, the template strand is read in a 3'-to-5' direction.
  - During transcription, the template strand is read in a 5'-to-3' direction.
  - During transcription, an RNA is transcribed in the 3'-to-5' direction.
  - During transcription, DNA is transcribed in the 5'-to-3' direction.
52. Which of the given choices will complete the following equation of glycolysis?  
 $\text{Glucose} + 2\text{NAD}^+ + \underline{\hspace{2cm}} + 2\text{P}_i \longrightarrow 2\text{NADH} + 2 \text{Pyruvate} + \underline{\hspace{2cm}} + 2\text{H}_2\text{O} + 4\text{H}^+$
- ADP and ATP
  - 2ADP and 2ATP
  - 3ADP and 3ATP
  - 4ADP and 4ATP
53. Auxochromes are groups present in coloured compounds which cause such compounds to absorb light
- towards the red end of the spectrum
  - towards the blue end of the spectrum
  - both of these
  - none of these
54. Removal of damaged RBCs from the blood takes place in the
- Thymus
  - Bone marrow
  - Lymph nodes
  - Spleen
55. The lymphocytes that identifies and destroys virus-infected cells is the
- CD4<sup>+</sup> T cell
  - B cell
  - Macrophage
  - NK cell
56. The characteristic feature of antibody secondary structure is called
- Paratope
  - Epitope
  - Immunoglobulin fold
  - Variable region
57. Failure to distinguish between self and non-self causes
- Cancer
  - AIDS
  - Autoimmunity
  - Multiple myeloma
58. The specificity of antibody-antigen interactions is
- predetermined
  - generated after exposure to antigen
  - does not depend on antigen
  - not measurable
59. Normal monohybrid cross yields a ratio of 3:1 in the F<sub>2</sub> generation. In some cases the ratio is found to be 2:1. This is due to
- Incomplete dominance
  - Recessive gene
  - Lethal gene
  - Mistake in crossing
60. Which of the following cannot cause mutation?
- X-ray
  - Infrared ray
  - Ultraviolet ray
  - Gamma ray
61. An inherited characteristic which does not appear in one generation, but can appear in the next is called
- recessive
  - dominant
  - homozygous
  - heterozygous
62. Transposons are
- known as jumping genes
  - responsible for the phenomenon observed by Barbara McClintock in maize
  - inserted at new sites by the activity of transposase
  - all the above
63. If AAbb is crossed to aabb, and the F<sub>1</sub> is test crossed, what percent of the test cross progeny will be aabb?
- 25 %
  - 50 %
  - 75 %
  - 100 %
64. Which of the following statements is correct?
- The genetic code is overlapping and punctuated by commas.
  - The genetic code is universal and punctuated by commas.
  - The genetic code is degenerate and commaless.
  - The genetic code is overlapping and commaless.
65. MutS is involved in
- Recombinational repair
  - Mismatch repair
  - Nucleotide excision repair
  - Direct repair
66. Prokaryotes include
- algae and fungi
  - bacteria and protozoa.
  - bacteria and cyanobacteria
  - viruses and cyanobacteria.
67. Oparin is known for his hypothesis on
- Origin of species
  - Origin of life.
  - One-germ-one disease
  - One germ-one enzyme.

68. The Na<sup>+</sup>- K<sup>+</sup> ATPase functions by pumping
- Three Na<sup>+</sup> ions out of the cell and two K<sup>+</sup> ions into the cell.
  - Two Na<sup>+</sup> ions out of the cell and three K<sup>+</sup> ions into the cell.
  - Three K<sup>+</sup> ions out of the cell and two Na<sup>+</sup> ions into the cell.
  - Two K<sup>+</sup> ions out of the cell and three Na<sup>+</sup> ions into the cell.
69. Cisternae which are concentric in arrangement with a convex face and a concave face, are found in the
- Chloroplast
  - Endoplasmic reticulum
  - Endocytic vesicles
  - Golgi complex.
70. Chloroplast DNA occurs as
- linear single-stranded molecules.
  - linear double-stranded molecules associated with histones.
  - covalently-closed circular molecules which lack histones.
  - covalently-closed circular molecules associated with histones.
71. The distance between two Z-lines in muscle constitute a
- centromere
  - telomere
  - cross-bridge
  - sarcomere
72. Two superfamilies of motor proteins associated with cilia/flagella movement are
- tropomyosin and troponin
  - kinesins and dyneins
  - kinesins and actin
  - actin and myosin.
73. Phosphatidylethanolamine is a lipid found in
- biological membranes
  - the mitochondrial matrix.
  - the nuclear matrix
  - the cytoplasm of a cell
74. Wine-making and bread baking both exploit the process of
- fermentation of pyruvate to lactate
  - fermentation of pyruvate to ethanol and CO<sub>2</sub>
  - aerobic oxidation of pyruvate
  - photosynthesis
75. During pregnancy, the chief source of progesterone is the
- ovary
  - placenta
  - uterus
  - mammary gland
76. The pyruvate dehydrogenase complex that catalyzes conversion of pyruvate to acetylCoA uses \_\_\_\_\_ number of coenzymes and prosthetic groups.
- 5
  - 4
  - 3
  - 2
77. Complete oxidation of a molecule of glucose in a cell yields
- ~ 8ATP
  - ~ 18 ATP
  - ~ 28 ATP
  - ~ 38 ATP
78. O<sub>2</sub> generated during photosynthesis originates from
- CO<sub>2</sub>
  - H<sub>2</sub>O
  - CO
  - C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>
79. Fatty acids are acylated to the amino acid
- aspartate
  - carnitine
  - ornithine
  - citrulline
- and transported across the mitochondrial membrane for β-oxidation.
80. The urea cycle is closely linked to
- Calvin cycle
  - Krebs' cycle
  - Glycolysis
  - pentose phosphate pathway
81. The disease caused by a defect in branched-chain α-keto acid dehydrogenase is
- phenylketonuria
  - alkaptonuria
  - maple syrup urine disease
  - Tay-Sachs disease
82. The salvage reaction of nucleotide metabolism is closely linked with
- SCID
  - Lesch-Nyhan syndrome
  - Philadelphia syndrome
  - colour blindness
83. Diabetes Insipidus is a disease caused by
- the lack of Insulin
  - the lack of a pancreas
  - vasopressin deficiency
  - kidney failure
84. An inborn error of metabolism is a condition caused by
- the lack of a key enzyme in a pathway
  - mutation of proteins involved in structural integrity
  - the lack of metabolism in certain tissues
  - a high basal metabolic rate

85. Proteinuria refers to
- presence of large amounts of albumin in the blood
  - presence of large amounts of albumin in the urine
  - absence of protein from the blood
  - absence of protein from the urine
86. In hypoxia the
- amount of  $O_2$  in the tissues is low
  - amount of  $CO_2$  in the tissues is very high
  - toxic amounts of  $O_2$  in the blood
  - partial pressure of  $O_2$  is extremely high
87. Dead space in the lungs means
- amount of air in the lungs which never equilibrates with the blood
  - percentage of air that can be used only by the alveoli
  - the total amount of air remaining in the lungs after expiration
  - the amount of air in the lungs of a dead mammal
88. Hypertension occurs due to
- increased venous blood pressure
  - increased arterial blood pressure
  - increased arterial and venous blood pressure
  - none of the above
89. The brain uses only
- glucose as an energy source
  - glucose, starch and glycogen as energy sources
  - only glycogen as the energy source
  - glucose and ketone bodies as the energy sources
90. Hypoglycemia means
- diabetic condition leading to absence of blood glucose
  - decreased blood glucose level
  - decreased amount of glucose in the tissues
  - increased blood glucose level
91. Lactose intolerance is a condition where
- milk taken in by an individual is immediately vomited out
  - lactose of the milk causes allergy
  - lactose is not digested due to absence of certain enzymes
  - all of the above
92. Name the gland which acts both as an 'endocrine' as well as an 'exocrine' gland
- Pancreas
  - Pituitary
  - Thyroid
  - Adrenal
93. Osteoporosis is a bone disease and
- it results due to bone fractures
  - it is caused by a decrease in bone density
  - it is prevalent in young children
  - it is undetectable
94. Bones glow in the dark because
- they contain shining material
  - they contain red phosphorus
  - white phosphorus undergoes slow combustion in contact with air
  - white phosphorus changes to the red form.
95. Natural rubber is
- Polyester
  - Polyamide
  - Polyisoprene
  - Polysaccharide
96. Tyndall effect is shown by
- Colloidal solution
  - Osmotic solution
  - Isotonic solution
  - Hypertonic solution
97. The amount of ammonium sulphate required to prepare 2 litres of 1 molar solution is
- 264 g
  - 132 g
  - 198 g
  - 212 g
98. Bacteria that are damaged by the normal atmospheric level of oxygen (20%) are called
- strict anaerobes
  - aerotolerant anaerobes
  - facultative anaerobes
  - microaerophiles
99. The following is an edible fungi
- Agaricus campestris*
  - Amanita phalloides*
  - Claviceps purpurea*
  - Cryptococcus neoformans*
100. Which of the following genome features are used for genetic profiling?
- genes
  - VNTR sequences
  - minisatellites
  - all of the above.

101. Which of the following is the correct order of events in genome sequencing?
- construction of clones, sequencing individual clones, assembly of sequence, mapping.
  - construction of clones, mapping, sequencing of individual clones, assembly of sequence .
  - mapping, construction of clones, sequencing individual clones, assembly of sequence.
  - construction of clones, simultaneous mapping and sequencing of individual clones, assembly of sequence.
102. The total genome sequence of which of the following organisms was known first?
- Escherichia coli*
  - Haemophilus influenzae*.
  - Caenorhabditis elegans*
  - Homo sapiens*.
103. The process which is not involved in the transfer of genes between bacteria is
- Transformation
  - Transduction
  - Conjugation
  - Transfection
104. The microorganism whose DNA polymerase is frequently used in PCR is extracted from?
- Methanothermus fervidus*
  - Sulfolobus acidocaldarius*
  - Thermus aquaticus*
  - Escherichia coli*
105. With regards to the Human Genome Project, ELSI stands for?
- Educational, Legal and Social Issues.
  - Ethical, Legal and Scientific Issues.
  - Educational, Legal and Scientific Issues.
  - Ethical, Legal and Social Issues.
106. The reaction from Protein to Amino acids is catalysed by
- Hydrolase
  - Isomerase
  - Lyase
  - Transferase
107. The reaction that converts Histidine to give Histamine and CO<sub>2</sub> is catalysed by
- Isomerase
  - Lyase
  - Hydrolase
  - Transferase
108. Acid fast staining method is used to identify the following
- Clostridium* sp.
  - Bacillus* sp.
  - Staphylococcus* sp.
  - Mycobacterium* sp.
109. The enzyme used for determining blood glucose level is:
- Glucose Oxidase
  - Malate dehydrogenase
  - Lactate dehydrogenase
  - Aspartate aminotransferase
110. Which of the following enzyme that breaks down starch to form glucose
- Urease
  - α-amylase
  - Glucose isomerase
  - catalase
111. Which of the following hormones contains Iodine?
- Insulin
  - Thyroxine
  - Oxytocin
  - Adrenalin
112. The stop codons are
- UAA, UAG, UGA
  - UAG, UAA, UGC
  - UGA, UAA, UAC
  - UAA, UGA, UCC
113. Hypoxia causes vasoconstriction in which of the following vascular beds
- cerebral
  - skin
  - muscle
  - pulmonary
114. When compared with the cones of retina, the rods
- are more sensitive to low intensity light
  - adapt to darkness before the cones
  - are more concentrated in the fovea
  - are primarily involved in color vision
115. The sharp and pointed outgrowths present on the stem of rose plant are called
- Prickles
  - Thorns
  - Spines
  - Hooks
116. Plant lose water by guttation when
- rate of transpiration is high
  - soil is dry and atmosphere is dry
  - soil is wet and atmosphere is humid
  - soil is wet and atmosphere is dry
117. Transpiration in plant is low during storms due to
- presence of moisture in the wind
  - low temperature during storms
  - high velocity of winds
  - none of these
118. Ascent of sap takes place through
- tracheary elements
  - cortical cells
  - sieve elements
  - none of these
119. Plant which depend upon other plants for shelter but not for food are called
- partial parasite
  - epiparasites
  - epiphytes
  - none of the above

120. In ovule, meiosis occurs in  
 a) megaspores  
 b) megaspore mother cell  
 c) endosperm  
 d) sporogonium
121. In albuminous seeds, the food is stored in  
 a) cotyledons  
 b) endosperm  
 c) testa  
 d) plumule
122. When pollen tube enters through funiculus or integument, it is called  
 a) porogamy  
 b) chalazogamy  
 c) mesogamy  
 d) isogamy
123. Weed killers generally have properties much like that of  
 a) vitamins  
 b) enzymes  
 c) hormones  
 d) insecticides
124. Mobilization of stored food in germinating seeds is initiated by  
 a) ethylene  
 b) gibberellins  
 c) cytokinins  
 d) kinetins
125. The number of genes in the human genome has been found to be  
 a) ~30,000  
 b) ~50,000  
 c) ~60,000  
 d) ~10,000
126. CO<sub>2</sub> generated in the tissues is carried in venous blood primarily as  
 a) CO<sub>2</sub> in plasma  
 b) carboxyhemoglobin in RBC's  
 c) HCO<sub>3</sub><sup>-</sup> in the plasma  
 d) H<sub>2</sub>CO<sub>3</sub> in plasma
127. Unpigmented living cells can be observed clearly under  
 a) Bright field microscope  
 b) Fluorescence microscope  
 c) Phase contrast microscope  
 d) none of these
128. Bacterial cells are rendered more permeable to uptake of plasmids by treatment with  
 a) heat  
 b) calcium chloride  
 c) alkali  
 d) ultrasound
129. Which of the following enzyme found in fungi that hydrolyses lactose  
 a) β-galactosidase  
 b) Protease  
 c) Amylase  
 d) Catalase
130. When parietal cells are stimulated, they secrete  
 a) HCl and intrinsic factor  
 b) HCl and pepsinogen  
 c) HCl and HCO<sub>3</sub><sup>-</sup>  
 d) mucus and pepsinogen
131. In DNA replication, the enzymes which unwinds DNA double helix is called  
 a) DNA isomerase  
 b) topoisomerase  
 c) gyrase  
 d) DNA polymerase
132. DNA sequences which signal the end of coding region of genes are called  
 a) promoters  
 b) elements  
 c) terminators  
 d) palindromes
133. SOS response of DNA repair results in  
 a) Error-prone repair  
 b) Direct repair  
 c) Mismatch repair  
 d) Nucleotide repair
134. Ninhydrin is used as a colour reagent in the detection of  
 a) DNA  
 b) disaccharides  
 c) monosaccharides  
 d) amino acids
135. Curie is the unit of  
 a) radiations per hour  
 b) radioactivity  
 c) radiations per minute  
 d) radiations per millisecond
136. Which of the following chemical mutagens is likely to cause base substitution after incorporation into a replicating DNA molecule?  
 a) 5-Bromouracil  
 b) 2-amino-purine  
 c) acrydine orange  
 d) hydroxylamine
137. DNA that is located between genes and is not used to specify a product but is discarded during RNA processing is known as  
 a) intron DNA  
 b) spacer DNA  
 c) exon DNA  
 d) regulatory DNA
138. Eukaryotic mRNA is modified before translation by  
 a) addition of a 5' cap  
 b) splicing of exons  
 c) addition of a 3' poly-A tail  
 d) all of these

139. When a number of coding sequences are present on a single mRNA, the mRNA is said to be
- multimeric
  - polymeric
  - polycistronic
  - polyclonal
140. How many polypeptides can be formed simultaneously by a given ribosome?
- one
  - about a dozen
  - up to 30
  - variable, depending on length of mRNA and temperature
141. Penicillin acts as an antibiotic in susceptible bacteria by interfering with
- cell-wall formation
  - protein synthesis
  - the Krebs cycle
  - the electron transport chain
142. RNA molecules differ from DNA molecules in all but which one of the following
- kinds of purines
  - kinds of pyrimidines
  - type of sugar
  - number of strands per molecule
143. The mitotic phase in which chromatids segregate to opposite poles of the cell is
- telophase
  - metaphase
  - anaphase
  - prophase
144. Which of the following occurs in meiosis but not in mitosis?
- Independent assortment
  - segregation of homologous chromosomes
  - crossing over
  - all of these
145. The phase of eukaryotic cell cycle during which DNA replicates is
- M
  - R
  - S
  - G<sub>1</sub>
146. An enzyme that phosphorylates a protein is known as a
- protein kinase
  - phosphatase
  - kinase
  - phosphorylase
147. An amino acid that has a secondary amine and disrupts  $\alpha$ -helix formation is
- threonine
  - phenylalanine
  - serine
  - proline
148. The movement of DNA at pH 8 in an electrical field during agarose gel electrophoresis is
- from the positive to the negative terminal
  - from the negative to the positive terminal
  - from an area of high concentration to an area of low concentration
  - from an area of low concentration to an area of high concentration
149. The Punjab wheat is a case of
- diploidy
  - triploidy
  - tetraploidy
  - hexaploidy
150. Carbon dioxide regulates blood flow to which one of the following organs
- heart
  - skin
  - brain
  - skeletal muscle at rest