



ST. ANTHONY'S COLLEGE, SHILLONG

ENTRANCE TEST FOR ADMISSION INTO POST GRADUATE PROGRAMME 2006

BIOTECHNOLOGY Part A

DATE : 24 May 2006
TIME : 10.00 am
DURATION : 90 minutes

INSTRUCTIONS

- ♦ There are 150 questions in this test divided into two parts. Part A consists of 100 multiple choice questions and are to be answered in the answer sheet provided by placing a cross mark in the box corresponding to the correct answer. Part B consists of 50 questions involving filling in blanks and matching columns. These are to be answered in the question paper itself.
- ♦ In part A every correct answer will be awarded 1 mark and for every wrong answer, .25 marks will be deducted. There will be no negative marking in part B.
- ♦ The candidate is to answer as many questions as possible in the time that is allotted for this test.
- ♦ Make sure that you have entered the hall ticket number properly in the place provided in the answer sheet and in the question paper for part B.
- ♦ Please preserve your hall tickets. 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 boards by 1.00 pm today. The shortlisted candidates will be required to attend an interview which will take place later today, and possibly tomorrow. 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 27th May, 2006.

1. What kind of structure does replicating eukaryotic DNA have?
 - a) Solenoid form
 - b) Extended nucleosome form
 - c) Looped solenoid form
 - d) Naked DNA form
2. When a mutation event leads to the replacement of one codon for another coding for the same amino acid, the resulting mutation is called
 - a) frameshift
 - b) transition
 - c) transversion
 - d) silent
3. All of the following are characteristics of Class Aves of Phylum Chordata except
 - a) Feathers on skin
 - b) External ear
 - c) Paired pentadactyl limbs
 - d) Oviparous
4. An adaptive enzyme is
 - a) a non-functional enzyme
 - b) a truncated enzyme
 - c) an enzyme with no specificity
 - d) an inducible enzyme
5. In plants, monocot leaves grow by
 - a) Apical meristem
 - b) Lateral meristem
 - c) Intercalary meristem
 - d) Dermatogen
6. Which of the following proteins is not found in the connective tissues?
 - a) Collagen
 - b) Elastin
 - c) Actin
 - d) Ossein
7. A plant structure with three radial vascular bundles would be
 - a) Monocot stem
 - b) Dicot stem
 - c) Monocot root
 - d) Dicot root
8. The most numerous cells in the human body are
 - a) Neurons
 - b) Erythrocytes
 - c) Myocytes
 - d) Lymphocytes
9. Lignified cell wall is a characteristic feature of
 - a) Xylem cells
 - b) Phloem cells
 - c) Epidermal cells
 - d) Cambial cells
10. Penicillin controls the growth of bacteria by
 - a) inhibiting cell wall synthesis
 - b) damaging cell wall structure
 - c) preventing DNA synthesis
 - d) preventing protein synthesis
11. Hollow, non helical, filamentous appendages that serve as port for the entry of genetic material during bacterial mating are called
 - a) Flagella
 - b) Pili
 - c) Cilia
 - d) microfilaments

Rough Work

12. The peptidoglycan component of cell walls in eubacteria is also called:
 - a) murein
 - b) pseudomurein
 - c) glycoprotein
 - d) murandron
13. In proteins, the α -helix is a feature of
 - a) Primary structure
 - b) Secondary structure
 - c) tertiary structure
 - d) Quarternary structure
14. The following are all measures of central tendency except
 - a) Median
 - b) Standard Deviation
 - c) Average
 - d) Mode
15. The major events of mitotic prophase include the following except
 - a) chromosome coiling
 - b) DNA replication
 - c) breakdown of nuclear envelope
 - d) nucleolar disaggregation
16. Phospholipid synthesis occurs in
 - a) ribosomes
 - b) rough ER
 - c) smooth
 - d) golgi bodies
17. The genetic disorder of women having XO arrangement is called
 - a) Turner's Syndrome
 - b) Down's Syndrome
 - c) Klinefelter Syndrome
 - d) Free Martin's Disease
18. The ratio of the volume of CO₂ produced by an organism during respiration to the volume of O₂ consumed is
 - a) pKa value
 - b) RQ value
 - c) residual volume
 - d) resolving power
19. The rhizosphere is:
 - a) the region around *Rhizobium sp.*
 - b) the most sterile region in the soil
 - c) the region where the roots contact soil
 - d) the most fertile region in soil
20. The *nif* genes in certain types of bacteria allow these bacteria to
 - a) fix soil nitrates
 - b) fix soil nitrites
 - c) fix soil ammonium
 - d) fix atmospheric nitrogen
21. An autoclave sterilizes materials by using
 - a) dry heat
 - b) high pressure alone
 - c) moist heat
 - d) moist heat under high pressure
22. A bacteriophages capable of integrating into host genome and thereby getting itself transmitted through cell divisions without causing cell host cell lysis is called
 - a) temperate phage
 - b) lytic phage
 - c) λ phage
 - d) none of these

Rough Work

33. A recombination frequency of 1% is defined as
a) one Morgan
b) one locus
c) one centimorgan
d) one allele
34. Down syndrome is
a) Trisomy 18
b) Trisomy 13
c) a Nullisomy
d) Trisomy 21
35. The arrangement of leaves in a bud with respect to each other is called
a) Vernation
b) Venation
c) Phyllotaxy
d) Ptyxis
36. In animals, ovaries produce
a) Oestrogen and progesterone
b) Oestrogen only
c) Progesterone only
d) Follicle-stimulating hormone and Luteinising hormone
37. The thin, clear coat around the mammalian egg is called
a) Corona radiata
b) Zona pellucida
c) Corpus luteum
d) Egg white
38. What will be the percentage of red tall plants in a cross between Aa TT and aa tt where A stands for red dominant T for tall dominant
a) 25 %
b) 50 %
c) 75 %
d) 100 %
39. Genetically identical progeny is produced when the individual
a) Performs self fertilization
b) Produces identical gametes
c) Practices inbreeding with meiosis
d) Practices reproduction
40. The phenomenon of an allele of one gene suppressing the activity of allele of another gene is called
a) Dominance
b) Epistasis
c) Suppression
d) Inactivation
41. Recombinations and variations in eukaryotic organism are due to
a) Mitosis and meiosis
b) Fertilization and mitosis
c) Meiosis and fertilization
d) Meiosis and amitosis

Rough Work

42. The EC number of an enzyme is :
- the number of substrate molecules converted to product molecules per molecule of enzyme per second
 - the number of subunits present in an oligomeric enzyme
 - a classification number used to identify accurately and unambiguously an enzymic reaction
 - the number of amino acid residues present in the enzyme molecule
43. Mutarotation of a sugar can best be described as:
- interconversion of pyranose and furanose forms
 - a rearrangement of the groups attached to the anomeric carbon atom via open chain form
 - interconversion of D- and L- forms
 - interconversion of aldose and ketose forms
44. When pH is less than the isoelectric point, the sign of the charge on a protein:
- is negative
 - is positive
 - depends on the pKa of the groups involved
 - depends on the composition of the protein
45. Lampbrush chromosomes found in the oocytes of amphibians are seen in
- Leptotene
 - Diplotene
 - Pachytene
 - none of these
46. A chromosome with terminal centromere is called
- Telocentric
 - Acrocentric
 - Polycentric
 - Metacentric
47. When a trait is inherited through only one parent it is called
- Incomplete dominance
 - Mendelian inheritance
 - Multiple allele inheritance
 - Cytoplasmic inheritance
48. Genetic identity of human male is known by
- Nucleolus
 - Cell organelles
 - Autosomes
 - Sex chromosomes
49. How many α - carboxyl groups are there in a decapeptide?
- 0
 - 1
 - 2
 - 10
50. Which amino acid does not exist as D- and L- optical isomers?
- Glycine
 - Proline
 - Histidine
 - No amino acid

Rough Work

51. Plants do not store carbohydrates as glucose because it
- dissolves in water, thereby altering the osmotic balance
 - attracts insect herbivores
 - is an unstable molecule
 - would replace ribose in DNA synthesis
52. Which pigment is present universally in all green plants
- Chlorophyll a
 - Chlorophyll b
 - Chlorophyll c
 - Chlorophyll m
53. Gram staining, a differential staining procedure, requires
- Malachite green
 - Crystal violet
 - Carbol Fuschin
 - Methylene blue
54. Solutions of amino acids are most effective as pH buffers
- when the pH is close to the respective pKa values
 - at pH 7.0
 - at the isoelectric point
 - when each group is fully protonated
55. *Lactobacillus* is used for the production of
- Alcohol
 - Cheese
 - Bread
 - Soya sauce
56. *Paramecium* is a
- Bacteria
 - Fungi
 - Protozoa
 - None of these
57. The insects captured by insectivorous plants partially fulfil their requirement of
- Enzymes
 - Oxygen
 - Nitrogen
 - Hydrogen
58. Which of the following elements is responsible for maintaining turgor?
- Sodium
 - Potassium
 - Calcium
 - Magnesium
59. A linear aldohexose with four chiral carbon atoms has how many possible structures?
- 2
 - 4
 - 16
 - 32
60. The number of reducing equivalents produced during one round of tricarboxylic acid cycle is
- 1 NADH & 3 FADH₂
 - 2 NADH & 2 FADH₂
 - 3 NADH & 1 FADH₂
 - 4 NADH & 0 FADH₂

Rough Work

81. Honey is
a) Acidic
b) Alkaline
c) Neutral
d) Acidic when fresh, alkaline when old
82. Bovine spongiform encephalopathy is more commonly known as
a) Parkinson's disease
b) Kala-azar
c) Mad Cow disease
d) Grave's disease
83. XXY condition of sex chromosomes occurs in
a) Turner's syndrome
b) Klinefelter's syndrome
c) Down's syndrome
d) Superfemale
84. Which of the following pigments acts as a reaction center during photosynthesis
a) P700
b) Cytochrome
c) Carotene
d) Phytochrome
85. First stable product of dark reaction in C_3 plants is
a) PEP
b) RuBP
c) PGA
d) OAA
86. In monocots the male gametophyte is
a) microspore
b) Megaspore
c) Tetrad
d) Nucellus
87. The fruit developing from an inflorescence is called
a) a composite fruit
b) a multiple fruit
c) etaerio
d) an etaerio of achenes
88. The inflorescence of family *Compositae* is called
a) Capitulum
b) Spike
c) Hypanthodium
d) None of these
89. Mobilization of stored food in germinating seeds is triggered by
a) auxins
b) cytokinins
c) gibberellins
d) ethylene
90. Which element is essential for photolysis of water
a) Nitrogen
b) Chlorine
c) Carbon
d) Oxygen
91. In the mammalian brain, the two cerebral hemispheres are joined together by
a) Corpus callosum
b) Corpus spongiosum
c) Corpus quadrigeminum
d) Corpus cavernosum

Rough Work

