ENTRANCE EXAMINATION FOR ADMISSION, MAY 2012.
M.Sc. (BIOCHEMISTRY & MOLECULAR BIOLOGY)

COURSE CODE : 368

Register Number : 

Signature of the Invigilator
(with date)

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COURSE CODE : 368

Time : 2 Hours
Max : 400 Marks

Instructions to Candidates :

1. Write your Register Number within the box provided on the top of this page and fill in the page 1 of the answer sheet using pen.

2. Do not write your name anywhere in this booklet or answer sheet. Violation of this entails disqualification.

3. Read each of the question carefully and shade the relevant answer (A) or (B) or (C) or (D) in the relevant box of the ANSWER SHEET using HB pencil.

4. Avoid blind guessing. A wrong answer will fetch you –1 mark and the correct answer will fetch 4 marks.

5. Do not write anything in the question paper. Use the white sheets attached at the end for rough works.

6. Do not open the question paper until the start signal is given.

7. Do not attempt to answer after stop signal is given. Any such attempt will disqualify your candidature.

8. On stop signal, keep the question paper and the answer sheet on your table and wait for the invigilator to collect them.

9. Use of Calculators, Tables, etc. are prohibited.
1. Following digestive juices are alkaline except:
   (A) saliva (B) gastric juice
   (C) pancreatic juice (D) succus entericus

2. Dead space means:
   (A) no space
   (B) temporary cessation of breathing
   (C) space where gaseous exchange takes place
   (D) space where gaseous exchange does not occur

3. Compound of haemoglobin and CO₂ is known as:
   (A) carbaminohaemoglobin (B) carboxyhaemoglobin
   (C) oxyhaemoglobin (D) ketohaemoglobin

4. Contractile protein which occurs in greatest amount in the skeletal muscle is:
   (A) actin (B) myosin
   (C) troponin (D) tropomysin

5. Counter current exchanger in kidney is constituted by the following except:
   (A) proximal tubule (B) ascending Henle’s loop
   (C) descending Henle’s loop (D) collecting duct

6. Which muscle is myogenic in contraction?
   (A) Cardiac muscle (B) Skeletal muscle
   (C) Intestinal smooth muscle (D) Both (A) and (C)

7. Nerve fiber becomes excited due to influx of:
   (A) potassium ion (B) sodium ion
   (C) calcium ion (D) chloride ion

8. Nature of synaptic transmission is mostly:
   (A) thermal (B) chemical
   (C) mechanical (D) electrochemical

9. An example of neurohormone is:
   (A) vasopressin (B) corticotrophin
   (C) somatotropin (D) somatomedin

10. Which statement about oxytocin is incorrect?
    (A) Promotes child birth (B) Promotes milk biosynthesis
     (C) Promotes milk ejection (D) Promotes semen aspiration
11. Which structure in ovary secretes progesterone?
   (A) Corpus luteum  (B) Corpus albicans
   (C) Graffian follicle (D) Primary follicle

12. Which of the following is not a second messenger?
   (A) Cyclic AMP  (B) Ca^{++}
   (C) Na^{+}       (D) Cyclic GMP

13. Direct and dominating factor of plant growth is:
   (A) soil     (B) wind
   (C) light    (D) temperature

14. Shedding of plant leaves, flowers and fruits is known as:
   (A) abscission (B) senescence
   (C) vernalisation (D) none of the above

15. The efficiency of any ecosystem is best depicted by pyramid of:
   (A) number     (B) energy
   (C) biomass    (D) volume

16. 'Biomes' describe:
   (A) desert vegetation  (B) ecological group of plants
   (C) ecological group of animals (D) relation between plant, animal and environment

17. Ozone layer occurs in:
   (A) troposphere  (B) stratosphere
   (C) heterosphere (D) thermosphere

18. After exponential increase a population becomes stagnant. The growth curve is:
   (A) J-shaped (B) S-shaped
   (C) fluctuating (D) circular

19. Earth summit of Rio de Janerio (1992) resulted in:
   (A) compilation of red list  (B) establishment of biosphere reserve
   (C) convention on biodiversity (D) formation of IUCN
20. First National Park in India is:
   (A) Kanha National Park
   (C) Kaziranga National Park
   (B) Jim Corbett National Park
   (D) Satpura National Park

21. Gene bank is a method for:
   (A) *ex situ* conservation
   (C) both of these
   (B) *in situ* conservation
   (D) none of these

22. BOD stands for:
   (A) biotic oxygen demand
   (C) biochemical oxygen decrease
   (B) biological oxygen demand
   (D) none of the above

23. Eutrophication is:
   (A) lack of algae in the lake
   (C) abundant nekton in the pond
   (B) excessive oxygen in the pond
   (D) abundant fertilizers in the lake

24. Minamata disease occurs due to toxic effects of:
   (A) fluoride
   (C) mercury
   (B) copper
   (D) cadmium

25. Filariasis is caused by:
   (A) *Plasmodium vivax*
   (C) *Wuchereria bancrofti*
   (B) *Leishmania donovani*
   (D) *Ascaris lumbricoides*

26. Silver carp is a kind of:
   (A) minor carp
   (C) indigenous carp
   (B) exotic carp
   (D) cartilaginous carp

27. HIV genome consists of:
   (A) single stranded RNA
   (C) double stranded RNA
   (B) single stranded DNA
   (D) double stranded DNA

28. Antibodies are synthesized and released by:
   (A) killer cells
   (C) plasma cells
   (B) helper cells
   (D) phagocytic cells

29. Body secretions mostly contain:
   (A) IgM
   (C) IgD
   (B) IgA
   (D) IgG
30. Most common example of single cell protein (SCP) is:
(A) Euglena  (B) Spirulina  
(C) Volvox  (D) None of the above

31. Fusion of protoplasts from two different varieties of plants produces:
(A) somatic hybrids  (B) genetic hybrids 
(C) distant hybrids  (D) vigour hybrids

32. A bacteria commonly used as probiotics is:
(A) Acetic acid bacteria  (B) Formic acid bacteria  
(C) Lactic acid bacteria  (D) Tartaric acid bacteria

33. Which of the following is a restriction enzyme?
(A) Trypsin  (B) EcoRI  
(C) Pepsin  (D) Chymotrypsin

34. Which of the following method is not a method for gene transfer?
(A) Heat shock to host cell  (B) Osmotic shock to host cell  
(C) Biolistics  (D) Microinjection

35. Polymerase chain reaction needs a thermostable DNA polymerase isolated from a bacterium known as:
(A) Thermus thermus  (B) Thermus aquaticus  
(C) Thermus marina  (D) Thermus namibiensis

36. *Bt* cotton contains a foreign gene isolated from:
(A) Bacillus thuringiensis  (B) Bacillus perfringens 
(C) Bacillus cereus  (D) Bacillus subtilis

37. Which method is a method for molecular diagnosis?
(A) PCR  (B) ELISA  
(C) Both of these  (D) None of these

38. The use of a bioresource by multinational companies without proper authorization to people having traditional knowledge about the utility of the bioresource is known as:
(A) bioterrorism  (B) biopiracy  
(C) biodesign  (D) biodiversity

39. The first disease cured by gene therapy in 1990 is:
(A) adenosine deaminase deficiency  (B) guanosine demainase deficiency  
(C) cytosine deaminase deficiency  (D) thymine deaminase deficiency
40. RNAi is a method for:
   (A) activating a gene   (B) silencing a gene
   (C) promoting a gene   (D) enhancing a gene

41. Disease caused by a defect in one amino acid is called as
   (A) Cystic fibrosis   (B) Cystinuria
   (C) Galactosemia     (D) Liver fibrosis

42. Spider webs are made of the strong and pliable protein called
   (A) Fibrin     (B) Keratin
   (C) Chitin     (D) Flagellin

43. Monoxygenases important for the detoxification of many drugs are
   (A) Cytochromes P450   (B) Isocitrate dehydrogenase
   (C) Pyruvate decarboxylase   (D) Flexokinase

44. The proton-sugar transporter in bacteria is
   (A) Uniport   (B) Symport
   (C) Antiport  (D) Diport

45. Megaloblastic anemia is the deficiency of
   (A) Cobalamin   (B) Thiamin
   (C) Riboflavin  (D) Polic acid

46. The major plant hormone auxin causes
   (A) Shoot growth and shoot initiation
   (B) Splitting of the internode
   (C) Cell expansion
   (D) Internodal elongation

47. Cyclins are proteins involved in regulation of
   (A) cell cycle   (B) circadian rhythm
   (C) membrane transport   (D) synthesis of cyclic Amp

48. Sickle cell anemia is
   (A) X-linked recessive   (B) Autosomal dominant
   (C) Autosomal recessive   (D) None of the above
49. Plant material can be surface sterilized by
   (A) Auxin  (B) Cytokinin
   (C) Both auxin and cytokinin  (D) Bromine water

50. Colchicine is one of the most effective
   (A) Spindle fiber promoter  (B) DNA synthesis inhibitor
   (C) Spindle fiber inhibitor  (D) Cell suspension media

51. *Atropa belladama* produces atropine which acts as a
   (A) Sweetner  (B) Dye
   (C) Muscle relaxant  (D) Insecticidal

52. Ti plasmids belongs to a
   (A) Natural bacterium  (B) Virus
   (C) Yeast  (D) Lambda phage

53. Some restriction endonucleases possess identical and cleavage sites and are called
   (A) Isochizomeres  (B) Isonucleases
   (C) Isoenzymes  (D) Isoendonucleases

54. When $\Delta G$ of a reaction is negative, the reaction is
   (A) at equilibrium
   (B) endergonic and tends to go towards forward reaction
   (C) endergonic and tends to go toward completion
   (D) exergonic and tends to go toward completion

55. Tetany is caused due to dietary deficiency of
   (A) Vitamin D  (B) Vitamin A
   (C) Iodine  (D) Calcium

56. Second largest gland of the body is
   (A) Pancreas  (B) Liver
   (C) Pituitary  (D) Thyroid

57. Ovule is attached to placenta by a slender stalk called
   (A) Pedicel  (B) Petiole
   (C) Placenta  (D) Funicle

58. The pollutants released by the jet planes are
   (A) Fogs  (B) Smogs
   (C) Colloids  (D) Aerosols
59. Which one of the following is a congenital disease?
   (A) AIDS  (B) Alacaptonuria
   (C) Night-blindness  (D) Allergy

60. Analogous structures are those whose similarity comes from
   (A) their performing a similar function, rather than their arising from a common ancestor
   (B) their being derived from a common ancestral structure
   (C) the wing of a bird and the forelimb of a human
   (D) their performing a dissimilar function, rather than their arising from a common ancestor

61. Species of bacteria, belonging principally to the genera Bacillus and Clostridium, produce extremely heat-resistant structures called
   (A) Endospores  (B) Ascospores
   (C) Exosporos  (D) Pilus

62. The action of pepsin requires a medium which is
   (A) Alkaline  (B) Acidic
   (C) Neutral  (D) Watery

63. Man has ______ pairs of salivary glands.
   (A) 3  (B) 2  (C) 5  (D) 1

64. The hormone that is responsible for male secondary sexual characters is
   (A) Prolactin  (B) Vasopressin
   (C) Insulin  (D) Testosterone

65. Pulmonary artery supplies
   (A) Oxygenated blood  (B) Deoxygenated blood
   (C) Serum  (D) Plasma

66. The final product of anaerobic respiration is
   (A) Carbohydrate  (B) Glyoxylate
   (C) Succinate  (D) Ethanol

67. The total capacity of lungs for accommodation is called
   (A) Tidal volume  (B) Complementary volume
   (C) Supplementary volume  (D) Vital capacity
68. The enzyme responsible for initiating the unwinding of double-stranded DNA (eliminating super coiling) by nicking a single strand of the DNA molecule is:
   (A) Topoisomerase  (B) Gyrase
   (C) Ligase        (D) Helicase

69. The enzyme that accomplishes the unwinding of the original double stranded DNA molecule, once supercoiling has been eliminated, by breaking the hydrogen bonds that hold the two strands together is:
   (A) Helicase       (B) Topoisomerase
   (C) DNA Polymerase II (D) Primase

70. The enzyme that stitches Okazaki fragments together (along the lagging strand) is called
   (A) DNA Ligase     (B) DNA Polymerase II
   (C) Topoisomerase  (D) Holoenzyme

71. DNA Polymerase III is actually an aggregate of several different protein subunits. So it is often called a:
   (A) Holoenzyme     (B) Primeosome
   (C) Replisome      (D) Isoenzyme

72. A repeating DNA sequence at the end of chromosomes that prevents them from losing base pair sequences at their ends and from fusing together is called:
   (A) Telomere       (B) Telomerase
   (C) A replicon     (D) Centromere

73. An enzyme (used by all retroviruses) that transcribes genetic information of the virus from RNA into DNA, is:
   (A) Methylase      (B) RNA polymerase
   (C) Restriction nuclease (D) Reverse transcriptase

74. In DNA, mutations at G-C sequences occur quite frequently since 5-methyl cytosine easily deaminates to form:
   (A) Thymine        (B) Adenine
   (C) Guanine        (D) Cytosine

75. The sequence of different amino acids in the polypeptide chain of a protein is called:
   (A) Secondary structure  (B) Tertiary structure
   (C) Primary Structure    (D) Quaternary structure
76. The Quaternary structure of a protein is:
(A) Its structure resulting from interactions between amino acid side chains
(B) Its structure resulting from hydrogen bonds between the C=O and N-H groups of different amino acids
(C) Its structure resulting from the union of more than one protein molecule, called subunit proteins
(D) Its amino acid sequence

77. Successive amino acids in the polypeptide chains that make up a protein are held together by:
(A) N-glycosidic bonds
(B) Interprotamine disulfide bonds
(C) Peptide bonds
(D) Phosphodiester bonds

78. Infectious self-reproducing agents consisting only of protein, with no nucleic acids (hypothesized in 1982 by Nobel Laureate Stanley B. Prusiner) are called:
(A) exteins
(B) proteomes
(C) prions
(D) proteinoids

79. Which of the following is not an aromatic amino acid?
(A) Phenylalanine
(B) Tryptophan
(C) Tyrosine
(D) Serine

80. Which of the following amino acids is polar?
(A) Valine
(B) Leucine
(C) Isoleucine
(D) Histidine

81. Factor VIII - an accessory protein that participates in the intrinsic pathway of coagulation is called as
(A) Antihemophilic factor
(B) Hemophilic protein
(C) Christmas factor
(D) Stuart-Prower factor

82. A mass of relatively unspecialized tissue that develops at wound sites in plants, forming a protective covering is
(A) Callus
(B) Callose
(C) Calculi
(D) Caldolysin

83. Cell fusion the formation of a single hybrid cell containing the nuclei and cytoplasms from different cells is induced by
(A) Killed Sendai virus
(B) Gum acacia
(C) Agar
(D) Agarose
84. A database of protein and nucleic-acid sequences is
   (A) Genapool  (B) Gen Bank
   (C) Gene cluster  (D) RNA family

85. The nonspecific uptake of extracellular fluid via small endocytic vesicles that pinch off from the plasma membrane is
   (A) Reverse flow  (B) Pinocytosis
   (C) Homeostasis  (D) Reverse osmosis

86. Each IgG antibody molecule consists of four polypeptide chains
   (A) Four polypeptide chains two non-identical light chains and two non-identical heavy chains
   (B) Two polypeptide chains
   (C) Four polypeptide chains two light chains and two identical heavy chains
   (D) Three polypeptide chains

87. One of the major glycoproteins in the plasma membrane of erythrocytes is
   (A) Glycophorin A  (B) Erythropoietin
   (C) Glycosphingoproteins  (D) Cerebrosides

88. Sugars that contain a free aldehyde or ketone group in the open-chain configuration are called
   (A) Reducing sugars  (B) Non reducing sugars
   (C) Ketotrioses  (D) Stereoisomers

89. D-glucose and D-galactose are epimers, differing only in their configuration at
   (A) C-4  (B) C-3
   (C) C-2  (D) C-1

90. Glycogen is a branched-chain polysaccharide containing glucose residues linked by
   (A) α1-4 bonds with α1-6 branch points
   (B) α1-6 bonds with α1-4 branch points
   (C) α1-2 bonds with α1-6 branch points
   (D) α1-4 bonds with α1-4 branchpoints

91. Epinephrine and glucagon stimulate
   (A) Glycogen degradation in liver  (B) Glycogen formation in liver
   (C) Protein degradation in liver  (D) Prostaglandins
92. Chlorophyll is a porphyrin in which
(A) Nitrogen atoms are coordinated to a magnesium ion
(B) Nitrogen atoms are coordinated to a copper ion
(C) Oxygen atoms are coordinated to a magnesium ion
(D) Carbon atoms are coordinated to a copper ion

93. Calvin cycle takes place only in
(A) Stroma (B) Inner membrane
(C) Outer membrane (D) Matrix

94. Nematode is a
(A) Round worm (B) Tape worm (D) Fluke
(D) Hooklet

95. A chronic granulomatous disease of the peripheral nerves and superficial tissues, particularly the nasal mucosa is
(A) Leporsy (B) Tuberculosis
(C) Granuloma (D) Brill's disease

96. The Calvin cycle begins by the attachment of CO₂ to which of the following?
(A) RuBP (B) Glucose
(C) Glyceraldehyde-3-phosphate (D) Acetyl CoA

97. Host-encoded proteins that provide the first line of defense against viral infections are
(A) Interferons (B) Transposons
(C) T cell encoded proteins (D) Tubulins

98. Many animal retroviruses have acquired transforming genes called
(A) Oncogenes (B) Pseudogenes
(C) Methylated genes (D) Nonmethylated genes

99. Antigenic determinants are known as
(A) Paratope (B) Carriers (C) Epitopes
(D) Markers

100. Toxic shock syndrome is caused by
(A) Endotoxins of Staphylococcus aureus
(B) Retroviruses
(C) Exotoxins of Staphylococcus aureus
(D) Lentiviruses

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