

2  
20

ENTRANCE EXAMINATION FOR ADMISSION, MAY 2010.

M.Sc. (MICROBIOLOGY)

COURSE CODE : 308

Register Number :



Signature of the Invigilator  
(with date)

COURSE CODE : 308

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 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. If a bacterial cell divides once in every minute it takes one hour to fill the cup, how much time it will take to fill half of the cup?  
 (A) 30 min                      (B) 15 min                      (C) 59 min                      (D) 45 min
2. In the life cycle of malarial parasite, the discovery of Sir Ronald Ross pertains to  
 (A) Merogony  
 (B) Gamogony  
 (C) Sporogony  
 (D) Both gamogony and sporogony
3. Agar is used as a base for preparing culture medium to grow bacteria and fungi, because  
 (A) It Liquefies a temperature below boiling point of water  
 (B) It gels on cooling  
 (C) It does not chemically interact with nutrients of culture medium  
 (D) All of the above
4. The life span of human erythrocytes is about  
 (A) 150 days                      (B) 120 days                      (C) 180 days                      (D) 90 days
5. How many mitotic divisions shall occur to produce 64 cells from 2 cells?  
 (A) 4                      (B) 62                      (C) 32                      (D) 63
6. If a homozygous red-flowered mirabilis plant is crossed with a homozygous white-flowered plant the first filial generation would yield  
 (A) all red flowered plants  
 (B) all white flowered plants  
 (C) all pink flowered plants  
 (D) red and white flowered plants in the ratio of 1 : 1
7. Bacterial leaf blight is a serious disease of  
 (A) Wheat                      (B) Maize                      (C) Barley                      (D) Paddy
8. A heterotroph gets its carbon from  
 (A) CO<sub>2</sub>    (B) Methane  
 (C) Soil    (D) Organic compounds

9. A grain of wheat is its  
(A) Embryo (B) Seed  
(C) Fruit (D) Seed and fruit
10. A specialized cell in root epidermis which gives rise to a root hair is known as  
(A) Idioblast (B) Tricoblast (C) Epiblema (D) Trophoblast
11. The colour filters used in colorimeters are to  
(A) filter the transmitted light  
(B) filter the incident light intensity  
(C) select the wavelength range of incident light  
(D) use the complementary colours for measuring the light
12. The standard deviation is  
(A) a test of significance  
(B) same as the centile  
(C) a measure of the scatter of observations about their mean  
(D) calculated from the mean and number of observations alone
13. In a prokaryotic cell the respiratory enzymes are located in  
(A) Plasma membrane (B) Mitochondria  
(C) Cytoplasm (D) Lysosomes
14. The genotype of an individual showing a particular dominant trait can be determined by  
(A) Cross breeding (B) Back crossing  
(C) Inbreeding (D) Outbreeding
15. Plasma continuously leaks out of capillaries; still the blood plasma level remains constant due to  
(A) Regular intake of fluids  
(B) Plasma returns to capillaries  
(C) Lymph vessels return the plasma to blood stream  
(D) Reabsorptive capacity of kidneys

16. Transcription is directly involved in which of the following steps in the flow of genetic information?
- (A) DNA to RNA (B) RNA to DNA  
(C) DNA to DNA (D) RNA to protein
17. Cancer is a disease associated with
- (A) RNA (B) Mitochondria  
(C) DNA (D) Ribosomes
18. BRCA oncogenes are responsible for producing cancer in the following organ
- (A) Liver (B) Lungs (C) Breast (D) Bones
19. Minamata disease was caused by
- (A) water pollution (B) methyl mercury poisoning  
(C) lead sulphate (D) carbon monoxide
20. Normal cell of the living human body can divide up to
- (A) 10-20 times (B) 100-150 times  
(C) 20-50 times (D) No limit
21. Immediate type of allergic reaction is mediated by the following antibody
- (A) IgA (B) IgD (C) IgE (D) IgM
22. Stomata, the small openings in the epidermis of the aerial plants are present abundantly on
- (A) Stem (B) Leaves (C) Roots (D) Fruits
23. Which of the following contributes as major pollinator?
- (A) Bats (B) Birds (C) Insects (D) Reptiles
24. Whenever the pathogenic microflora establishes in the body, the normal microflora?
- (A) Decreases  
(B) Remains unaffected  
(C) Increases  
(D) No correlation between the microflora

25. Antidotes are used for the treatment of  
 (A) Malaria (B) Poisoning  
 (C) Diabetes (D) Cardiac diseases
26. Anaemia may be caused due to the deficiency of  
 (A) Phosphorus (B) Calcium (C) Iron (D) Vitamin A
27. Highest amount of melanin pigment is found in  
 (A) hairs (B) skin (C) nails (D) brain
28. Climatic changes are occurring due to  
 (A) Volcanic eruptions (B) Global warming  
 (C) Changes in ecosystems (D) Pollution
29. Which one of the following is not a green house gas?  
 (A)  $\text{CO}_2$  (B)  $\text{CH}_4$  (C) CFC (D)  $\text{O}_2$
30. The technique developed in the field of biological science is  
 (A) TLC (B) Electrophoresis  
 (C) Western blots (D) PCR
31. CAM plants are distinguished by  
 (A) Stomatal opening during day time  
 (B) Stomatal opening during night  
 (C) Stomatal closure during day and night  
 (D) Stomatal opening during day and night
32. Reduction of supporting and protective tissues and presence of rudimentary vascular tissue characterize  
 (A) hydrophytes (B) xerophytes  
 (C) physiological xerophytes (D) mesophytes
33. Pyruvic acid acts as  
 (A) Hydrogen acceptor in aerobic respiration  
 (B) Intermediate substrate in aerobic respiration  
 (C) Electron acceptor  
 (D) Hydrogen acceptor in fermentation and intermediate substrate in aerobic respiration

34. 2-4D is a
- (A) Plant growth regulator (B) Synthetic plant growth regulator  
(C) Plant growth substance (D) Auxin
35. PAN causes
- (A) Air pollution (B) Soil pollution  
(C) Photochemical smog (D) None of the above
36. Teratogen is a chemical substance which causes
- (A) Cancer  
(B) Development of malformation in an embryo or fetus  
(C) Hereditary change  
(D) All the above
37. Which one is exhaustible but renewable natural source?
- (A) Fossil (B) Petroleum product  
(C) Forest (D) Coal
38. One of the following is sedimentary and gaseous cycle
- (A) Carbon cycle (B) Sulphur cycle  
(C) Oxygen cycle (D) Hydrogen cycle
39. In the leaves sucrose Synthesis occurs in
- (A) chloroplasts  
(B) mesophyll cells  
(C) cytosol of photosynthetic cells  
(D) palisade cells
40. Photosynthesis involving separation of time of initial capturing of  $\text{CO}_2$  and the its eventual use in Calvin cycle is encountered in
- (A) Succulent plants (B) Xerophytes  
(C) Physiological xerophytes (D) Sciophytes

25. Antidotes are used for the treatment of  
(A) Malaria (B) Poisoning  
(C) Diabetes (D) Cardiac diseases
26. Anaemia may be caused due to the deficiency of  
(A) Phosphorus (B) Calcium (C) Iron (D) Vitamin A
27. Highest amount of melanin pigment is found in  
(A) hairs (B) skin (C) nails (D) brain
28. Climatic changes are occurring due to  
(A) Volcanic eruptions (B) Global warming  
(C) Changes in ecosystems (D) Pollution
29. Which one of the following is not a green house gas?  
(A)  $\text{CO}_2$  (B)  $\text{CH}_4$  (C) CFC (D)  $\text{O}_2$
30. The technique developed in the field of biological science is  
(A) TLC (B) Electrophoresis  
(C) Western blots (D) PCR
31. CAM plants are distinguished by  
(A) Stomatal opening during day time  
(B) Stomatal opening during night  
(C) Stomatal closure during day and night  
(D) Stomatal opening during day and night
32. Reduction of supporting and protective tissues and presence of rudimentary vascular tissue characterize  
(A) hydrophytes (B) xerophytes  
(C) physiological xerophytes (D) mesophytes
33. Pyruvic acid acts as  
(A) Hydrogen acceptor in aerobic respiration  
(B) Intermediate substrate in aerobic respiration  
(C) Electron acceptor  
(D) Hydrogen acceptor in fermentation and intermediate substrate in aerobic respiration

41. Several nutrient media have been employed in tissue culture experiments. A basal medium refers to a medium which contains
- (A) inorganic salts of major and minor elements, vitamins and sucrose
  - (B) sucrose and growth hormones
  - (C) sucrose only
  - (D) inorganic salts, vitamins sucrose and growth substances
42. Internal dormancy of seeds may be due to
- (A) incomplete development of embryo
  - (B) presence of inhibitors in the seeds
  - (C) impervious nature of testa to water
  - (D) all the above
43. Energy is characterized by
- (A) multidirectional flow
  - (B) derived flow ecosystem
  - (C) produced at different trophic levels
  - (D) utilized at different tropical levels
44. Electrostatic precipitators used widely in power plants are extremely effective in removing
- (A) Pollutants
  - (B) Gaseous pollutants
  - (C) Submicron particulates
  - (D) Particulate matter
45. The junction between the two helical portions of tRNA is stabilized by many non-standard base-base interactions between residues in the
- (A) anticodon and CCA ends
  - (B) helical stems of the D and Anticodon stems
  - (C) loops of the Anticodon and Acceptor stem
  - (D) loops of the TYC and D arms
46. According to the fluid mosaic model of cell membranes, which type of molecule spans the membrane from its inner to outer surface?
- (A) cholesterol
  - (B) phospholipids
  - (C) protein
  - (D) triacylglycerol



47. When it functions as a "second messenger", cAMP
- (A) acts outside the cell to influence cellular processes
  - (B) acts "second in importance" to AMP
  - (C) activates all cytosolic protein kinases
  - (D) activates the cAMP-dependent protein kinase
48. The ATP synthase of bacteria is an F1-like particle attached to the
- (A) ends of proto-mitochondria
  - (B) inner surface of the cell (or plasma) membrane
  - (C) outer surface of the cell (or plasma) membrane
  - (D) surface of protonic vesicles
49. The lone pair electrons on oxygen in a  $H_2O$  molecule
- (A) are not important for the properties of water
  - (B) carry a partial negative charge
  - (C) carry a partial positive charge
  - (D) make water an apolar solvent
50. Peptide bonds are
- (A) stable thermodynamically and kinetically
  - (B) stable thermodynamically, but unstable kinetically
  - (C) unstable thermodynamically and kinetically
  - (D) unstable thermodynamically, but stable kinetically
51. Which pertains to viruses?
- (A) Are prokaryotic
  - (B) Have 70S ribosomes
  - (C) All contain DNA and RNA
  - (D) None of the above
52. Which pertains to antibiotics?
- (A) Chemicals produced by one microorganism that inhibits other microorganisms
  - (B) Can only interfere with cell wall synthesis of the pathogen
  - (C) Completely synthesized in the laboratory
  - (D) Always has toxic side-effects for the patient

53. Which of the following is NOT true?
- (A) Dark field microscope show bright organisms on a dark background
  - (B) Bright field scopes show dark organisms on a bright background
  - (C) Transmission electron microscope uses electrons that are focused by a magnet to penetrate through the organism, captured by receivers and used to form an image on a monitor
  - (D) Structures that differ in density or movement are best seen in action with the use of a phase contrast microscope
54. In phase contrast microscopy the special optical system makes it possible to distinguish cells which differ slightly in their
- (A) Size
  - (B) Diameter
  - (C) Refractive index
  - (D) Length
55. The fungal mycelium penetrates the plant cells by means of projections called
- (A) Arbuscules
  - (B) Absorbing organ
  - (C) Haustoria
  - (D) None
56. There are 64 codon in genetic code for \_\_\_\_\_ Amino acids
- (A) 21
  - (B) 24
  - (C) 20
  - (D) 19
57. \_\_\_\_\_ is an Initiation codon.
- (A) CCC
  - (B) GUC
  - (C) AUG
  - (D) CUG
58. The end of a single Chromosome is called as
- (A) Capsomer
  - (B) Telomer
  - (C) Proteomer
  - (D) Centromere
59. The dictionary of coded language of genetic information is called
- (A) Cryptogram
  - (B) Crytogram
  - (C) Wikkepedia
  - (D) Histogram
60. Antibodies are
- (A) Alpha-1-globulin
  - (B) Alpha-2-globulin
  - (C) Beta globulin
  - (D) None of above
61. Magnification of high power of a compound microscope is
- (A) 100
  - (B) 400
  - (C) 500
  - (D) 1000

62. Nitrogen fixing algae belong to  
 (A) Cyanophyceae (B) Rhodophyceae  
 (C) Chlorophyceae (D) None of the above
63. The Fc region of Antibody  
 (A) Contains both heavy & light chain  
 (B) Is required for Ag binding  
 (C) Is not a required for placental transmittion  
 (D) Generally confers biological activity on the various molecules
64. The ratio of heavy chain to light chain is  
 (A) 2 : 1 (B) 3 : 1 (C) 1 : 2 (D) 2 : 2
65. Allergic reactions are related with  
 (A) IgE (B) JgD (C) IgG (D) IgM
66. \_\_\_\_\_ are used frequently as indices of fecal pollution in water & food  
 (A) Only *E. coli*.  
 (B) *E. coli* & *Cl. perfringens*  
 (C) *E. coli* & *Strept. faecalis*  
 (D) *Cl. perfringens* & *Strept. faecalis*.
67. For enumeration of coliform organisms \_\_\_\_\_ method is used.  
 (A) IMViC reaction (B) MPN  
 (C) Standard plate count (D) None of the above
68. The size, weight moistum Content & \_\_\_\_\_ of air born particles are of importance in consideration of methods for disinfecting air.  
 (A) Shape (B) Opacity to UV light  
 (C) Both (A) and (B) (D) Electrical charge
69. \_\_\_\_\_ test is designated to enumerate total viable Population.  
 (A) Presumptive test (B) Completed test  
 (C) Standard plate count (D) Confirmed test

70. A useful method or compound for sterilizing foods such as fresh vegetables
- (A) Ionizing radiation
  - (B) Ultraviolet light
  - (C) Steam autoclave
  - (D) Phenols
71. Unlike animals, fungi
- (A) Digest their food before ingesting it
  - (B) Ingest their nutrients before digesting them
  - (C) Photosynthesize their food before digesting it
  - (D) None of the above
72. Mycorrhizae
- (A) Aid in the transfer of minerals from the soil to a plant
  - (B) Aid in the transfer of minerals to fungi
  - (C) Are found only on aquatic fungi
  - (D) Cause a variety of plant diseases
73. Blue green algae are
- (A) Eukaryotes
  - (B) Prokaryotes
  - (C) Plants
  - (D) None of the above
74. Unicellular fungi that resemble bacteria are called
- (A) Ascocarp
  - (B) Lichen
  - (C) Mold
  - (D) Yeast
75. Hyphae that do NOT have septa are called
- (A) Coenocytic
  - (B) Dimorphism
  - (C) Mycelium
  - (D) Sporangium
76. The cell walls of fungi are made of
- (A) Eukaryotic and nonphotosynthetic
  - (B) Multicellular and prokaryotic
  - (C) Prokaryotic and photosynthetic
  - (D) Unicellular and photosynthetic
77. The cell walls of fungi are made of
- (A) Cellulose
  - (B) Chitin
  - (C) Mycelia
  - (D) Silica

78. The individual filaments that make up the body of a fungus are called  
(A) Rhizoids (B) Stems  
(C) Hyphae (D) Vascular tissue
79. An industrial important use of fungi is in  
(A) The making of cheese (B) The manufacture of soft drinks  
(C) The production of antibiotics (D) All of the above
80. Mushrooms are  
(A) Actinomycets (B) Basidiomycets  
(C) Ascomycets (D) None of the above
81. All of the following enzymes are initially made as zymogens EXCEPT  
(A) ribonuclease (B) chymotrypsin  
(C) carboxypeptidase (D) trypsin
82. Enzymes that catalyze stepwise hydrolysis of mononucleotides from one end of a polynucleotide chain are  
(A) polymerases (B) endonucleases  
(C) ligases (D) exonucleases
83. The major nitrogenous component in urine from adult on an adequate maintenance diet is  
(A) Ammonia (B) Creatinine (C) Urea (D) Uric acid
84. In a double stranded DNA molecule, If Adenine accounts to 20% of the total bases, the percentage of cytosine would be  
(A) 30 (B) 50 (C) 40 (D) 20
85. A strict vegetarian diet (no meat, fish or dairy products whatever) is most likely to be deficient in which of the following?  
(A) Protein (B) Choline  
(C) Vitamin B12 (D) Folic acid
86. The absence of which coagulation factor is responsible for classical hemophilia A?  
(A) Factor II (B) Factor V  
(C) Factor VIII (D) Factor IX

87. Diabetes Insipidus is a disease related to
- (A) Hyperactivity of adrenal medullary hormones
  - (B) Hyposecretion of Anterior pituitary hormone
  - (C) Low levels of vasopressin from posterior pituitary
  - (D) Insulin resistance
88. Cyanide poisoning interferes with
- (A) oxygen carrying capacity of Hb
  - (B) oxygen utilization by cytochromes and mitochondrial oxidative phosphorylation
  - (C) transfer of nerve impulses at myo-neural junctions
  - (D) none of the above
89. Who is considered the "*father of modern biochemistry*"?
- (A) Carl Neuberg
  - (B) Jons Jacob Berzelius
  - (C) Alfred Bernhard Nobel
  - (D) Emil (adolf) von Behring
90.  $\alpha$ -Tocopherol is stored in
- (A) Mitochondria & microsomes
  - (B) Microsomes & nuclear
  - (C) Nucleus
  - (D) None of the above
91. The foods stuffs having the protein sparing effect
- (A) Carbohydrate
  - (B) Fat
  - (C) Both of the above
  - (D) None of the above
92. Which of the following cells are most numerous?
- (A) Helper T cells
  - (B) Killer T cells
  - (C) Cytotoxic T cells
  - (D) Memory cells
93. Factors responsible for a  $H_2O$  molecule being a dipole include
- (A) The similarity in electron affinity of hydrogen &  $O_2$
  - (B) The tetrahedral structure of liquid  $H_2O$
  - (C) The magnitude of the H-O-H bond angle
  - (D) The ability of  $H_2O$  to H<sub>2</sub> bond to various chemical structure

94. Which of the following statements is not universally applicable to enzymes?
- (A) They generally work very rapidly
  - (B) They will bind one substrate only
  - (C) They are not used up during a reaction
  - (D) They are proteins
95. An organism exhibiting a novel phenotype as a result of the presence of a mutation is referred to as a \_\_\_\_\_
- (A) Allele
  - (B) Mutant
  - (C) Isoalleles
  - (D) All the above
96. Rain drops contain which of the following vitamins
- (A) Vitamin B<sub>12</sub>
  - (B) Vitamin B<sub>2</sub>
  - (C) Vitamin D
  - (D) Vitamin A
97. Buffer is a composition of \_\_\_\_\_
- (A) Weak acid and its salt
  - (B) Weak acid and weak base
  - (C) Weak acid and water
  - (D) Weak acid and strong base
98. The substance which enhances the immune response of an antigen is known as \_\_\_\_\_
- (A) Interleukin-II
  - (B) Adjuvants
  - (C) NK cells
  - (D) Humoral response
99. Wine can be produced by the fermentation of \_\_\_\_\_
- (A) Berries
  - (B) Grapes
  - (C) Honey
  - (D) All the above
100. Salts and sugar preserve the foods because they \_\_\_\_\_
- (A) Make them acidic
  - (B) Produce a hypotonic environment
  - (C) Produce a hypertonic environment
  - (D) Deplete nutrient
-