

ENTRANCE EXAMINATION FOR ADMISSION, MAY 2011.

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. Which of the following plants does not have a single marine species?  
(A) Fungi (B) Bryophytes  
(C) Algae (D) Monocots
2. Reticulocytes refer to  
(A) White blood cells (B) Blood platelets  
(C) Immature erythrocytes (D) Lymphocytes
3. In *Homo sapiens*, fertilization occurs in  
(A) Uterus (B) Vagina  
(C) Oviduct (D) Cervix
4. During which phase of mitosis all cell growth occurs?  
(A) Metaphase (B) Prophase  
(C) Interphase (D) Telophase
5. Which of the following families include large number of vegetable-yielding plants?  
(A) Rutaceae (B) Labiatae  
(C) Apocynaceae (D) Solanaceae
6. Opium is obtained from  
(A) Roots (B) Dried leaves  
(C) Unripe capsules (D) Dried seeds
7. Which of the following is a living fossil?  
(A) Sea cucumber (B) Feather star  
(C) Brittle star (D) Sea urchin
8. Which of the following is not essential for survival of an individual?  
(A) Endocrine system (B) Sensory system  
(C) Reproductive system (D) Lymphatic system
9. Heat, alcohol, phenol and formalin damage living cells because they  
(A) Cause injury to cell membranes and cell walls of microbes  
(B) Denature proteins  
(C) Oxidize enzymes and coenzymes of microbes  
(D) All the above

10. A chemical substance derived from a living source that has the ability to kill or inhibit growth is called
- (A) Vaccine (B) Toxin  
(C) Toxoid (D) Antibiotic
11. Which of the following is **not** a tuber crop?
- (A) Sweet potato (B) Sugar beet  
(C) Tapioca (D) Groundnut
12. The electrical resistance across a cell membrane is very high because of
- (A) Proteins (B) Carbohydrates  
(C) Lipids (D) Water
13. The alkaloid present in tobacco is
- (A) Morphine (B) Nicotine  
(C) Caffeine (D) Theophylline
14. Which of the following plants causes contact dermatitis and asthma?
- (A) Pyrethrum (B) Cestrum  
(C) Wrightia (D) Parthenium
15. Hormone responsible for milk ejection from mammary gland is
- (A) Prolactin (B) Oxytocin  
(C) LH (D) Vasopressin
16. In higher plants ammonia assimilation is mediated by
- (A) Glutamine synthetase (B) Glutamate synthetase  
(C) GS-GOGAT system (D) Ammonifying bacteria
17. Nitrate assimilation in higher plants to the level of ammonia is mediated by
- (A) Nitrate reductase (B) Nitrite reductase  
(C) Nitrate and nitrite reductase (D) All of the above
18. Choose the asymbiotic nitrogen fixing bacteria
- (A) Azotobacter (B) Clostridium  
(C) Rhodospirillum (D) All the above

19. Darwin-Dana theory is related to  
 (A) Coral reef formation  
 (B) Classification of Coelenterate animals  
 (C) Relationship between sponges and Coelenterates  
 (D) All of the above
20. Mariculture is a form of  
 (A) Aquaculture  
 (B) Apiculture  
 (C) Sericulture  
 (D) Horticulture
21. Totipotent cells are present in  
 (A) Hydra  
 (B) Paramecium  
 (C) Proctodeum of honey bees  
 (D) All the above
22. Which of the following parasite is **not** having intermediate host?  
 (A) Ascaris sp.  
 (B) Ancylostoma sp.  
 (C) Enterobius sp.  
 (D) All of the above
23. Leprosy is due to  
 (A) Fungi  
 (B) Bacteria  
 (C) Virus  
 (D) Algae
24. Which of the following is sex linked inheritance?  
 (A) Pernicious anemia  
 (B) Cretinism  
 (C) Night blindness  
 (D) Colour blindness
25. The largest cell in human body is  
 (A) Liver cell  
 (B) Muscle cell  
 (C) Kidney cell  
 (D) Nerve cell
26. Golden rice is very rich in  
 (A) Vitamin B1 & copper  
 (B) Vitamin B<sub>12</sub> & iron  
 (C) Carotinoids & iron  
 (D) Vitamin B complex & vitamin C
27. Because penicillin prevents peptidoglycan synthesis, it is more effective on \_\_\_\_\_ cells.  
 (A) Gram positive bacteria  
 (B) Gram negative bacteria  
 (C) Mycobacterium  
 (D) Fungi

28. Differences between eukaryotic and prokaryotic cells include all of the following except
- (A) eukaryotic cells have mitochondria
  - (B) prokaryotic cells have more complex cell walls
  - (C) eukaryotic cells have cilia and flagella with complex structure
  - (D) prokaryotic cells have no genetic material
29. The fact that viruses are obligate intracellular parasites means that they require a \_\_\_\_\_ for reproduction.
- (A) culture dish
  - (B) host cell
  - (C) phenol red broth
  - (D) secondary virus
30. The bacterial envelope includes all of the following structures except
- (A) capsule
  - (B) cell wall
  - (C) cell membrane
  - (D) endospore
31. The cell wall of gram-positive bacteria may contribute to the development of septic shock. Identify the component which is most associated with the induction of septic shock
- (A) Capsular protein
  - (B) Endotoxin
  - (C) Peptidoglycan
  - (D) Teichoic acid
32. Holozoic nutrition is characterized by
- (A) Phagocytosis of solid nutrients and subsequent formation of phagocytic vacuoles
  - (B) Pinocytosis of solid nutrients and subsequent formation of phagocytic vacuoles
  - (C) Phagocytosis of soluble nutrients and subsequent formation of phagocytic vacuoles
  - (D) Encystment of solid nutrients and subsequent formation of secretory vacuoles
33. Genetic variation in viruses contributes to their ability to evade the immune response.
- Select the principal means by which antigenic shift occurs in influenza A virus.
- (A) Low fidelity of RNA dependent RNA polymerase
  - (B) Low fidelity of reverse transcriptase
  - (C) Reassortment of fragments of the RNA genome
  - (D) Recombination between RNA genomes

34. Which of the following is **not** a function of cysts for Protozoa?
- (A) Protect against adverse environments.
  - (B) Sites for nuclear reorganization and cell division.
  - (C) Serve as a means of transfer between hosts in parasitic species.
  - (D) All of the above may be a function of cysts for Protozoa.
35. The aminoglycosides are very active group of antibacterial agents, particularly against Gram-negative bacilli. Identify their mode of action from the list.
- (A) Disruption of cytoplasmic membrane function
  - (B) Inhibition of bacterial cell wall synthesis
  - (C) Inhibition of bacterial DNA gyrase
  - (D) Inhibition of protein synthesis
36. All of the following structures of bacteria contain (or are made of) protein except
- (A) plasmids
  - (B) ribosomes
  - (C) pili
  - (D) cell membrane
37. Organisms that ferment glucose may produce any of the following end products except
- (A) lactic acid
  - (B) propionic acid
  - (C) alcohol
  - (D) oxygen
38. Most human pathogens prefer temperatures near that of the human body. They are called
- (A) psychrophiles
  - (B) thermophiles
  - (C) mesophiles
  - (D) halophiles
39. Many antiviral drugs act by inhibition of a viral DNA polymerase enzyme. Select the virus for which this class of drugs would be effective.
- (A) Cytomegalovirus
  - (B) Influenza
  - (C) Measles
  - (D) Mumps
40. A pair of genes controlling a pair of contrasting characters is called
- (A) Allele
  - (B) Homozygous
  - (C) Heterozygous
  - (D) Recessive

41. Heparin  
 (A) Is a hormone (B) Prevents coagulation of blood  
 (C) Help in clotting of blood (D) Present in digestive juice
42. Blood groups are named based on antigens present in  
 (A) Blood plasma (B) W.B.C  
 (C) R.B.C. (D) Platelets
43. Plague is caused by  
 (A) Virus (B) Bacteria  
 (C) Fungi (D) Insect bite
44. A cell increases in volume when placed in a solution which is  
 (A) Isotonic (B) Hypertonic  
 (C) Hypotonic (D) None of the above
45. The terminal end of a chromosome is called  
 (A) Centromere (B) Metamere  
 (C) Telomere (D) None of the above
46. Development of embryo without fertilization is termed as  
 (A) Parthenogenesis (B) Parthinocarpy  
 (C) Polyembryony (D) Adventive embryony
47. If the ribosomes of a cell are destroyed then  
 (A) Cellular respiration is affected  
 (B) Photosynthetic process is affected  
 (C) Fat storage does not take place  
 (D) Protein synthesis will not take place
48. Which one of the following is **not** a viral disease?  
 (A) Rabies (B) Measles  
 (C) Small pox (D) Typhoid
49. In man the cell division **does not** take place in  
 (A) Gonads (B) Epithelial tissue  
 (C) Connective tissue (D) Muscular & nervous tissue

50. Cataract is caused by
- (A) Accumulation of dust in the eye
  - (B) Lens getting opaque
  - (C) Nerves supplying the eyes getting weak
  - (D) Conjunctiva become thickened
51. Which of the following disease is caused by air pollution?
- (A) Rheumatism
  - (B) Bronchitis
  - (C) Coronary heart disease
  - (D) Leukemia
52. Virus mediated transfer of genetic material from one bacterial cell to another bacteria is termed as
- (A) Transformation
  - (B) Conjugation
  - (C) Tansduction
  - (D) Transposition
53. A cross between two true breeding lines one with dark blue flowers and one with bright white flowers produces F1 offspring that are light blue. When the F1 progeny are selfed a 1:2:1 ratio of dark blue to light blue to white flowers is observed. What genetic phenomenon is consistent with these results?
- (A) epistasis
  - (B) incomplete dominance
  - (C) random mating
  - (D) inbreeding depression
54. Mutations which occur in body cells which do not go on to form gametes can be classified as
- (A) auxotrophic mutations
  - (B) somatic mutations
  - (C) morphological mutations
  - (D) temperature sensitive mutations
55. Polyploidy refers to
- (A) extra copies of a gene adjacent to each other on a chromosome
  - (B) an individual with complete extra sets of chromosomes
  - (C) a chromosome which has replicated but not divided
  - (D) multiple ribosomes present on a single mRNA
56. DNA ligase is
- (A) an enzyme that joins fragments in normal DNA replication
  - (B) an enzyme involved in unwinding of DNA double helix
  - (C) an enzyme of bacterial origin which cuts DNA at defined base sequences
  - (D) an enzyme that facilitates transcription of specific genes



57. The malarial parasite is transmitted by  
 (A) Sand fly (B) House fly  
 (C) Mosquito (D) None of the above
58. Auxins are  
 (A) Plant growth promoters (B) Insecticides  
 (C) Herbicides (D) None of the above
59. The protein coat of virus is called  
 (A) Capsid (B) Cell membrane  
 (C) Nucleoprotein (D) Cellulose
60. Protein in hair is  
 (A) Melanin (B) Keratin  
 (C) Glycogen (D) Collagen
61. Erythroblastosis foetalis or Hemolytic Disease of the Newborn (HDNB) occurs when  
 (A) When mother is Rh- and the foetus is Rh-  
 (B) When mother is Rh+ and the foetus is Rh-  
 (C) When mother is Rh- and the foetus is Rh +  
 (D) When mother is Rh+ and the foetus is Rh +
62. When a surgeon conducts a bypass surgery by transplanting a piece of vein from patient's leg to the same patient's heart, this is  
 (A) xenograft (B) allograft  
 (C) autograft (D) isograft
63. Infection with HIV cause  
 (A) Primary immunodeficiency disease  
 (B) Acquired hypersensitivity syndrome  
 (C) Acquired immunodeficiency syndrome  
 (D) Severe combined immune deficiency disease
64. Triple antigen vaccines given in the immunization schedule of newborns are  
 (A) MMR and BCG (B) MMR and DPT  
 (C) MMR and OPV (D) BCG and OPV

65. In which type of symbiosis do both members benefit from their interaction?
- (A) Commensalisms (B) Mutualism  
(C) Parasitism (D) Pathogenesis
66. A phycologist studies
- (A) Classification of fungi (B) Characteristics of algae  
(C) Parasites (D) Plant viruses
67. Endospores
- (A) Can remain alive for decades  
(B) Can withstand extreme temperatures  
(C) Can remain alive in boiling water  
(D) All of the above
68. Which of the following is smallest?
- (A) Decimeter (B) Millimeter  
(C) Micrometer (D) Nanometer
69. Which gas reduces the oxygen carrying capacity of Hemoglobin?
- (A)  $\text{CO}_2$  (B)  $\text{O}_3$   
(C) CO (D) NO
70. AIDS virus specifically affects
- (A) Liver cells (B) Lungs  
(C) T lymphocytes (D) Erythrocytes
71. Blood of which of the following animal does not carry  $\text{O}_2$
- (A) Frog (B) Insects  
(C) Earthworm (D) Starfish
72. Which of the following can regenerate into individual after it has been cut into pieces?
- (A) Earthworm (B) Planaria  
(C) Round worm (D) Jelly fish
73. Rickets, Scurvy and Poor Vision are caused due to deficiency of
- (A) Vitamins D, E and K (B) Vitamins D, C and A  
(C) Vitamins D, B and E (D) Vitamins D, C and E

74. Trisomy of 21<sup>st</sup> Chromosome leads to
- (A) Cretinism (B) Acromegaly  
(C) Truners Syndrome (D) Down's Syndrome
75. The infective stage of malarial parasite *Plasmodium vivax* in man is
- (A) Schizont (B) Sporozoite  
(C) Merozoite (D) Trophozoite
76. What does ligase do during replication of DNA?
- (A) Makes copies of mRNA from DNA (B) Removes damaged sections of DNA  
(C) Joins together mRNA (D) Joins together DNA segments
77. What was one of the first and most useful microscopic tests for classifying bacteria that is still important today?
- (A) Gram stain (B) Flagella stains  
(C) Simple stains (D) Negative stain for capsule
78. Which is NOT true of viruses?
- (A) Are obligate intracellular parasites  
(B) Can be destroyed with antibiotics  
(C) Can be observed with an electron microscope  
(D) Are acellular
79. The mechanism whereby an enveloped virus leaves a host cell is called?
- (A) Transduction (B) Budding  
(C) Teratogenesis (D) Lysogeny
80. Absence of all life forms
- (A) Clean (B) Disinfected  
(C) Sterile (D) Aseptic
81. Which of the following is commonly used to prepare incision sites for surgery and as a surgical scrub?
- (A) Ethyl alcohol (B) Hydrogen peroxide  
(C) Iodophor (D) Glutaraldehyde

82. Which does not pertain to broad-spectrum drugs?
- (A) Often used when the pathogen has not been identified
  - (B) Can also kill or inhibit the patient's normal flora
  - (C) Include oral penicillin and tetracycline
  - (D) Can only kill Gram+ bacteria
83. In SEM, the secondary electrons are converted into
- (A) Tertiary electrons
  - (B) Electric current
  - (C) Electric charges
  - (D) None
84. Which is mismatched?
- (A) Replication = formation of 2 identical DNA molecules
  - (B) Transcription = mRNA synthesized from a DNA template
  - (C) Translation = tRNA transfers amino acids to the ribosomes based on mRNA codons
  - (D) Anticodon = sequence of 3 nitrogenous bases on the gene
85. Which of the following is NOT involved in bacterial conjugation?
- (A) Bacteriophage
  - (B) F+ cells
  - (C) F- cells
  - (D) Sex pili
86. Which of the following is NOT used to classify viruses?
- (A) Presence or absence of envelope
  - (B) Shape of capsid
  - (C) Type of nucleic acid
  - (D) Biochemical reactions
87. If you were asked to sterilize a heat sensitive item which of the following would be most suitable?
- (A) Steam autoclave
  - (B) Pasteurization
  - (C) Ethylene oxide
  - (D) Ethyl alcohol

88. \_\_\_\_\_ bacteria can fix the nitrogen.
- (A) Pseudomonas (B) Staphylococcus  
(C) Rhizobium (D) Lactobacillus
89. \_\_\_\_\_ is the obligatory interaction.
- (A) Mutualism (B) Commensalism  
(C) Cooperation (D) Ammensalism
90. \_\_\_\_\_ medium is used in the presumptive test
- (A) Lauryl sulphate tryptone broth (B) Mac Conkeys broth.  
(C) Sodium azide glucose broth (D) Yeast extract mannitol broth
91. If a chromophore of a stain is negatively charged, the stain is usually classified as a(n)
- (A) Basic stain (B) Acidic stain  
(C) Acid-fast stain (D) Carbol-fuschin stain
92. From DNA to protein information pass through a
- (A) m-RNA (B) hn-RNA  
(C) t-RNA (D) r-RNA
93. Three of 64 codon are called as \_\_\_\_\_ codon because they do not specify t-RNA.
- (A) Sense (B) Nonsense  
(C) Anticodon (D) False
94. \_\_\_\_\_ is a smallest unit of chromosome which undergoes mutational changes
- (A) Recon (B) Intron  
(C) Gene (D) Muton

95. \_\_\_\_\_ refers to all the heritable changes in the genome, excluding those resulting from incorporation of genetic material from other organisms.
- (A) Recombination (B) Mutation  
(C) Transformation (D) Genetic exchange
96. \_\_\_\_\_ phenotype mutations result in the death of cells or organisms.
- (A) Sub vital (B) Lethal  
(C) Super vital (D) Induced
97. Antibody formation depends on
- (A) Age of the person (B) Amount of antigen  
(C) Well being of the person (D) All of the above
98. Active immunity is induced by
- (A) Infection (B) Placental transfer of antibodies  
(C) Injection of antibodies (D) All of the above
99. Antibodies are synthesized by
- (A) B lymphocytes (B) phagocytes  
(C) helper T lymphocytes (D) killer T lymphocytes
100. The father of immunization was
- (A) Louis Pasteur (B) Edward Jenner  
(C) Salk (D) Sabin
-