

ENTRANCE EXAMINATION FOR ADMISSION, MAY 2012.

Ph.D. (MICROBIOLOGY)

COURSE CODE : 128

Register Number :

Signature of the Invigilator
(with date)

COURSE CODE : 128

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) or (E) 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.

I. MICROBIOLOGY

1. The phenomenon of Phagocytosis which led to cellular concept of immunity was discovered by:
(A) Metchnikoff (B) Portier & Richet
(C) Ruska (D) Wright
2. Following are the contributions of Louis Pasteur EXCEPT:
(A) Establishment of growth requirements of microbes.
(B) Introduction of staining techniques.
(C) Process of attenuation
(D) Techniques of sterilization.
3. The unit of resolution with unaided eye is:
(A) 10 μ (B) 100 μ (C) 200 μ (D) 300 μ
4. In which of the following, the reflected light is used instead of transmitted light?
(A) Dark ground microscope (B) Electron microscope
(C) Light microscope (D) Phase contrast microscope
5. One micron is equivalent to:
(A) 0.01 mm (B) 0.001 mm (C) 0.0001 mm (D) 0.00001 mm
6. The thickness of bacterial cell membrane ranges between:
(A) 2-5 nm (B) 5-10 nm (C) 10-15 nm (D) 15-20 nm
7. The bacteria are uniformly stained in the following phase of bacterial growth curve:
(A) Lag phase (B) Log phase
(C) Decline phase (D) Stationary phase
8. The lethal effect of moist heat is due to the following methods EXCEPT:
(A) Coagulation of enzymes
(B) Coagulation of proteins
(C) Denaturation of proteins
(D) Oxidative damage of essential constituents

9. The 'D' value measure the rate of kill at a given temperature and is expressed as the time required in minutes to reduce the number of viable organisms by:
 (A) 30% (B) 50% (C) 80% (D) 90%
10. Which of the following is used as a biological indicator to monitor steam sterilizer?
 (A) *Bacillus subtilis* (B) *Bacillus stearothermophilus*
 (C) *Clostridium tetani* (D) *Pseudomonas aeruginosa*
11. Heart lung machine is sterilized by:
 (A) Betapropiolactone (B) Ethylene oxide
 (C) Formaldehyde (D) Glutaraldehyde
12. Physiological saline means:
 (A) 0.75% NaCl in water (B) 0.8% NaCl in water
 (C) 0.85% NaCl in water (D) 0.9% NaCl in water
13. The range of pH of methyl red indicator is :
 (A) 2.8-4.6 (B) 3.6-5.2 (C) 4.4-6.2 (D) 4.5-8.3
14. The new glasswares :
 (A) can be need as such
 (B) can be used washing with water
 (C) should be placed in alkaline solution and then sterilization
 (D) should be placed in acidic solution and then sterilization
15. In virology lab, for spilled blood, the effective concentration of hypochlorites is:
 (A) 10,000 ppm of available chlorine (B) 1000 ppm of available chlorine
 (C) 100 ppm of available chlorine (D) 10 ppm of available chlorine
16. The use of Beta Lactamase producing control strains is recommended when testing the sensitivity of coliforms and staphylococcus aureus isolates to amoxyclave.
 (A) *E. coli* NCTC 10418 + *Staphylococcus aureus* NCTC 6571
 (B) *E. coli* NCTC 11560 + *Staphylococcus aureus* NCTC 11561
 (C) *E. coli* NCTC 10418 + *Staphylococcus aureus* NCTC 11561
 (D) *E. coli* NCTC 11560 + *Staphylococcus aureus* NCTC6571

17. The maximum amount of blood can be collected from the heart of the rabbit is upto
(A) 25 ml (B) 50 ml (C) 75 ml (D) 150 ml
18. Aminoglycosides interfere with;
(A) Cell wall synthesis (B) Cyto membrane function
(C) Nucleic acid synthesis (D) Protein synthesis
19. For providing microaerophilic atmosphere, the preferred mixtures is:
(A) 90% Nitrogen + 10% Carbon dioxide
(B) 90% Hydrogen+10% Carbon dioxide
(C) 80% Oxygen+10%Carbondioxide+10% Nitrogen
(D) 100% Hydrogen
20. The concentration of agar used for solidifying culture media is usually :
(A) 0.5 – 1.0% (B) 1.0 – 2.0% (C) 3.0 – 4.0% (D) 4.0 – 5.0%

II. IMMUNOLOGY

21. Which of the following statements best describes the properties of haptens?
(A) Immunogenic & reactive with antibody
(B) Immunogenic but not reactive with antibody
(C) Not immunogenic but reactive with antibody
(D) Chemically complex, macromolecular structures
22. Precipitation reaction is very sensitive for the detection of:
(A) Antibodies (B) Antigens
(C) Antigen- Antibody complex (D) Complement
23. Serological reaction in which soluble antigen adsorbed on a carrier particle is called:
(A) Haemagglutination (B) Passive Precipitation
(C) Passive agglutination (D) Reverse passive agglutination

24. Most widely accepted theory of antibody production is :
- (A) Clonal selection theory (B) Direct template theory
(C) Indirect template theory (D) Side chain theory
25. Drug-induced haemolytic anaemia is due to:
- (A) Type I hypersensitivity (B) Type II hypersensitivity
(C) Type III hypersensitivity (D) Type IV hypersensitivity
26. T_H cells recognize antigen in association with:
- (A) DP/DR locus (B) MHC - I
(C) MHC - II (D) MHC - III

III. SYSTEMATIC BACTERIOLOGY

27. Neonatal meningitis that is acquired in the birth canal is often caused by:
- (A) Staphylococcus aureus (B) Streptococcus agalactiae
(C) Staphylococcus epidermidis (D) Streptococcus pyogenes
28. Meningococcal meningitis in children less than five years most often is caused by strains belonging to:
- (A) Serogroup A (B) Serogroup B
(C) Serogroup C (D) Serogroup W-135
29. The following statements are true in case of Corynebacterium diphtheriae EXCEPT:
- (A) Dick's test
(B) Elek's gel precipitation test
(C) Non toxigenic strain can be converted into toxigenic
(D) Schick's test
30. A positive Schick's test implies that the person is:
- (A) Immune & hypersensitive
(B) Immune & non hypersensitive
(C) Non Immune & hypersensitive
(D) Susceptible & non hypersensitive

31. Which of the following foods is most often associated with enteric type of food poisoning caused by *Bacillus cereus*?
- (A) Egg (B) Milk (C) Meat (D) Rice
32. A 23 year old Olympic high diver received an abrasion of the right fore arm by striking the side of the swimming pool. A granulomatous lesion developed at the site of the injury and eventually ulcerated. The most likely etiological agent of the lesion is:
- (A) *Mycobacterium intracellulae* (B) *Mycobacterium kansasii*
(C) *Mycobacterium marinum* (D) *Mycobacterium ulcerans*
33. The following statements are true regarding *Mycobacterium tuberculosis* EXCEPT:
- (A) Form rough, tough and buff colonies on L-J medium
(B) Niacin test positive
(C) Nitrate reduction test positive
(D) Aryl sulphatase test positive
34. Tuberculoid leprosy is seen in patients with :
- (A) Good cell mediated immunity (B) Good humoral immunity
(C) Poor cell mediated immunity (D) Poor humoral immunity
35. Which of the following bacterial colonies fluoresce brick red in UV light?
- (A) *Bacteroides fragilis* (B) *Bacteroides gingivalis*
(C) *Bacteroides levii* (D) *Bacteroides melaninogenicus*
36. Sereny's test is used for detection of:
- (A) EPEC (B) EIEC (C) EPEC (D) ETEC
37. An elderly hospitalized patient has developed lobar pneumonia. Which of the following organisms can be suspected ?
- (A) *Enterobacter aerogenes* (B) *Escherichia coli*
(C) *Klebsiella pneumoniae* (D) *Proteus mirabilis*
38. Which of the following species of *Shigella* is predominant in India?
- (A) *Shigella boydii* (B) *Shigella dysenteriae*
(C) *Shigella flexneri* (D) *Shigella sonnei*

39. Identify the appropriate clinical specimen for culture & sensitivity during the first week of Enteric fever:
 (A) Blood (B) Bile (C) Faeces (D) Urine
40. On Wilson & Blair medium, the colour of colonies of *Salmonella paratyphi* 'A' will be:
 (A) Black (B) Green (C) Purple (D) Pink
41. Identification of *Salmonella typhi* in culture is confirmed by slide agglutination with:
 (A) Factor 2 antiserum (B) Factor 4 antiserum
 (C) Factor 5 antiserum (D) Factor 9 antiserum
42. The most reliable investigation for the diagnosis of Syphilis is:
 (A) DGM (B) FTA-ABS (C) RPR (D) VDRL

IV. PARASITOLOGY

43. *Diphyllobothrium latum* causes
 (A) Haemorrhage (B) Iron deficiency anemia
 (C) Megaloblastic anemia (D) Thalasemia
44. Infective agent in *Schistosoma haematobium* infection is
 (A) Cercaria (B) Metacercaria
 (C) Miracidium (D) Sporocyst
45. Redia stage is seen in the life cycle of
 (A) *Diphyllobothrium latum*
 (B) *Fasciola hepatica*
 (C) *Strongyloides stercoralis*
 (D) *Trichinella spiralis*
46. Non bile stained eggs are seen in the following parasite EXCEPT
 (A) *Ascaris lumbricoides* (B) *Ancylostoma duodenale*
 (C) *Enterobius vermicularis* (D) *Hymenolepis nana*
47. The infected RBC's are enlarged in case of infection caused by
 (A) *Plasmodium ovale* (B) *Plasmodium falciparum*
 (C) *Plasmodium malariae* (D) *Plasmodium vivax*

V. VIROLOGY

48. The following are the live vaccines EXCEPT
(A) Measles (B) Rabies
(C) Varicella (D) Yellow fever
49. The time interval from the stage of penetration till the appearance of mature daughter virions inside the host cell is called
(A) Eclipse phase (B) Extrinsic incubation period
(C) Incubation period (D) Latent period
50. Which of the following is not a clinical manifestation of Epstein barr virus infection?
(A) Burkitt's lymphoma (B) Infectious mononucleosis
(C) Intrauterine infection (D) Nasopharyngeal carcinoma
51. Presence of HBe Ag in a patient is indicative of
(A) High infectivity (B) Recovery
(C) Resistance (D) Simple carrier state
52. Most effective, cheapest and easily available disinfectant against HIV is
(A) Dettol (B) Glutaraldehyde
(C) Sodium hypochlorite (D) Spirit
53. The most common cause of viral diarrhea in young children is caused by
(A) Enterovirus (B) Echovirus
(C) Norwalk virus (D) Rotavirus
54. The transmission of arboviral diseases is by the following vectors EXCEPT
(A) Mosquito (B) Reduvid bug
(C) Sandfly (D) Tick

VI. MYCOLOGY

55. Sclerotic bodies are seen in
(A) Chromoblastomycosis (B) Mycetoma
(C) Rhinosporidiosis (D) Sporotrichosis
56. The pH of Sabouraud's dextrose agar is
(A) 5.4 (B) 6.4 (C) 7.4 (D) 8.0

57. A minor thorn pick progresses from a local pustule to an ulcer. The most likely agent is
- | | |
|-----------------------------------|------------------------------------|
| (A) <i>Candida albicans</i> | (B) <i>Cryptococcus neoformans</i> |
| (C) <i>Histoplasma capsulatum</i> | (D) <i>Sporothrix schenckii</i> |
58. The causative agent of desert rheumatism is
- | | |
|-------------------------------------|---------------------------------|
| (A) <i>Blastomyces dermatitidis</i> | (B) <i>Coccidioides immitis</i> |
| (C) <i>Histoplasma capsulatum</i> | (D) <i>Sporothrix schenckii</i> |
59. Favus is caused by
- | | |
|---------------------------------|----------------------------|
| (A) <i>Tinea mentagrophytes</i> | (B) <i>Tinea rubrum</i> |
| (C) <i>Tinea schoenleinii</i> | (D) <i>Tinea tonsurans</i> |
60. Fungal agents acquired by inhalation include EXCEPT
- | | |
|------------------------------------|---------------------------------|
| (A) <i>Cryptococcus neoformans</i> | (B) <i>Coccidioides immitis</i> |
| (C) <i>Histoplasma capsulatum</i> | (D) <i>Candida</i> |

IMMUNOLOGY

Multiple completion type (Q.61 to 100)

- | |
|-----------------------------|
| (A) If 1, 2 & 3 are correct |
| (B) If 1 & 3 are correct |
| (C) If 2 & 4 are correct |
| (D) If 4 is correct |
| (E) If all 4 are correct |
61. The potential of bacteria to cause infection depends upon their ability to
1. Adhere to the host cell
 2. Colonise the host tissues
 3. Multiply on or within the host tissues
 4. Penetrate host tissue
62. Artificial passive immunity is transferred by:
- | | |
|-------------------------|---------------------|
| 1. Convalescent sera | 2. Hyperimmune sera |
| 3. Pooled gammaglobulin | 4. Typhoid vaccine |

63. A patient is admitted to the hospital of a suspected deficiency in T cell reactivity tests that would be useful for determination of this deficiency include
1. Enumeration of blood cell bearing HLA determinants.
 2. Enumeration of blood cell bearing receptors for sheep erythrocytes.
 3. Enumeration of lymphocytes bearing surface immunoglobulins
 4. Tuberculin skin testing
64. Prozone phenomenon
1. Occurs in the area of antibody excess.
 2. Occurs in the area of antigen excess.
 3. Causes misinterpretation of results.
 4. Involve the rapid differentiation of antigen & antibody.

SYSTEMIC BACTERIOLOGY

65. Clostridia that have been associated with gas gangrene and called established pathogen in humans include
- | | |
|-----------------------------|-------------------------|
| 1. Clostridium bifermentans | 2. Clostridium novyi |
| 3. Clostridium difficile | 4. Clostridium septicum |
66. The antibiotics associated with pseudomembrane colitis are
- | | |
|--------------------|----------------|
| 1. Ampicillin | 2. Clindamycin |
| 3. Chloramphenicol | 4. Ofloxacin |
67. Antibiotic therapy is useful in
- | | |
|-------------------|-----------------|
| 1. Anthrax | 2. Diphtheria |
| 3. Food poisoning | 4. Gas gangrene |
68. The grading of smear in case of *Mycobacterium tuberculosis* is useful
1. For a quantitative assessment of the number of bacilli in sputum.
 2. To estimate the infectiousness of the patient.
 3. To monitor effectiveness of the antimycobacterial activity.
 4. To determine the disconfirmation of respiratory isolation.

69. Carrier state in enteric fever can be detected by culturing the following clinical specimen
1. Bile
 2. Blood
 3. Faeces
 4. Bone marrow
70. *Shigella* produces toxins namely
1. Enterotoxin
 2. Neurotoxin
 3. Verocytotoxin
 4. Endotoxin
71. The drugs used for treatment of enteric fever are
1. Cotrimoxazole
 2. Chloramphenicol
 3. Cefotaxime
 4. Ceftriaxonellfish
72. Wound infection following exposure to sea water of infected shellfish is caused by
1. *Aeromonas*
 2. *Vibrio alginolyticus*
 3. *Vibrio vulnificus*
 4. *Vibrio cholerae*
73. Distinguishing features of classical and elTor vibrio include:
1. Hemolysis on blood agar
 2. Sensitivity to polymyxin B
 3. Sensitivity to
 4. Voges Proskauer reaction
74. Regarding the seventh pandemic of cholera the following statements are true
1. Originated in Indonesia
 2. Caused by El Tor vibrio
 3. Severity of illness is less
 4. originated in India.
75. Premunition or infection immunity is seen in the following
1. Chicken pox
 2. Malaria
 3. Rickettsial fever.
 4. Syphilis.
76. The following bacteria require arthropod vector for transmission.
1. *Coxiella burnetti*
 2. *Rickettsia akari*
 3. *Rickettsia prowazakii*
 4. *Bartonella Quintana*
77. The following act as vectors in transmission of Rickettsial diseases
1. Louse
 2. Mite
 3. Rat flea
 4. Tick

78. The diseases caused by *Chlamydiae trachomatis* serotypes A-K are
1. Endemic blinding trachoma
 2. Genital Chlamydiasis
 3. Inclusion conjunctivitis
 4. Acute Psittacosis
79. The primary amoebic meningoencephalitis is caused by
1. *Acanthamoeba castellanii*
 2. *Escherichia coli*
 3. *Entamoeba histolytica*
 4. *Naegleria fowleri*
80. Which diseases is transmitted by insect vectors?
1. Filariasis
 2. Hydatid cyst
 3. Malaria
 4. Paragonimiasis
81. Creeping infections is caused by:
1. *Ancylostoma caninum*
 2. *Ancylostoma braziliensis*
 3. *Strongyloides stercoralis*
 4. *Trichuris trichura*
82. The following microfilariae are found in the blood EXCEPT
1. *Dipetolonema perstans*
 2. Loa Loa
 3. *Onchocerca volvulus*
 4. *Wuchereria bancrofti*
83. The parasite which enters through skin is
1. *Ancylostoma duodenale*
 2. *Dracunculus medinensis*
 3. *Strongyloides stercoralis*
 4. *Taenia saginata*
84. The following are flagellated protozoans
1. *Balantidium*
 2. *Giardia*
 3. *Naegleria*
 4. *Trypanosoma*
85. Lab diagnosis of kala azar involves
1. Aldehyde test
 2. Blood smear examination
 3. Bone marrow examination
 4. Culture on NNN medium

86. Which morphological forms of *Plasmodium falciparum* are observable in stained smears of peripheral blood?
1. Gametocytes
 2. Merozoites
 3. Ring forms
 4. Schizonts
87. Examples of acid fast protozoan parasite include
1. *Cryptosporidium parvum*
 2. *Entamoeba histolytica*
 3. *Isospora belli*
 4. *Pneumocystis carinii*
88. Infections acquired on eating poorly cooked meat include
1. *Enterobius vermicularis*
 2. *Taenia saginata*
 3. *Trichuris trichura*
 4. *Trichinella spiralis*
89. The growth of virus in tissue culture can be detected by
1. CPE
 2. Presence of viral proteins
 3. Hemadsorption
 4. IF
90. The following are the continuous cell line
1. HeLa
 2. HEP-2
 3. McCoy
 4. Rhesus monkey kidney cell culture
91. The infections caused by Adenoviruses include
1. Acute follicular conjunctivitis
 2. Diarrhoea
 3. Epidemic keratoconjunctivitis
 4. Hepatitis
92. Congenital rubella syndrome is characterized by
1. Cardiac defects
 2. Cataract
 3. Deafness
 4. Pneumonia
93. Opportunistic infections in HIV positive patients are caused by
1. *Candida* species
 2. Cytomegalovirus
 3. *Strongyloides stercoralis*
 4. Tuberculosis

94. True statements regarding HB carrier state include
1. High titers of HBs Ag in blood
 2. DNA polymerase
 3. HBV in circulation
 4. Elevated transaminases
95. Intranuclear inclusion bodies are seen with viruses such as
1. Adenovirus
 2. Pox virus
 3. Herpes virus
 4. Rabies virus
96. Arboviruses causing haemorrhagic fever are
1. Russian Spring Summer Encephalitis
 2. Kyasanur Forest Diseases.
 3. Japanese Encephalitis
 4. Chickungunya
97. The commonest moulds that grow on damp bread
1. Aspergillus
 2. Epidermophyton
 3. Penicillium
 4. Sporothrix
98. Actinomycotic mycetomas are usually caused by
1. Actinomyces israelii
 2. Madurella girea
 3. Nocardia brasiliensis
 4. Staphylococcus aureus
99. The true statement regarding Cryptococcus neoformans
1. Gram positive large, spherical budding cell
 2. Causes severe meningitis
 3. Gram positive large, oval budding cell
 4. Dimorphic fungus
100. Aetiological agents of superficial mycoses include
1. Candida
 2. Epidermophyton
 3. Microsporum
 4. Trichophyton