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(To be filled in the OMR Sheet)

प्रश्नपुस्तिका क्रमांक
Question Booklet No.

O.M.R. Serial No. | | | | | | | | |

प्रश्नपुस्तिका सीरीज
Question Booklet Series
B

M.Sc (Microbiology) First Semester, Examination, February/March-2022
MIC-1001
General Microbiology

Time : 1:30 Hours **Maximum Marks-100**

जब तक कहा न जाय, इस प्रश्नपुस्तिका को न खोलें

निर्देश : –

1. परीक्षार्थी अपने अनुक्रमांक, विषय एवं प्रश्नपुस्तिका की सीरीज का विवरण यथास्थान सही– सही भरें, अन्यथा मूल्यांकन में किसी भी प्रकार की विसंगति की दशा में उसकी जिम्मेदारी स्वयं परीक्षार्थी की होगी।
2. **इस प्रश्नपुस्तिका में 100 प्रश्न हैं, जिनमे से केवल 75 प्रश्नों के उत्तर परीक्षार्थियों द्वारा दिये जाने है। प्रत्येक प्रश्न के चार वैकल्पिक उत्तर प्रश्न के नीचे दिये गये हैं। इन चारों में से केवल एक ही उत्तर सही है। जिस उत्तर को आप सही या सबसे उचित समझते हैं, अपने उत्तर पत्रक (O.M.R. ANSWER SHEET)में उसके अक्षर वाले वृत्त को काले या नीले बाल प्वांइट पेन से पूरा भर दें। यदि किसी परीक्षार्थी द्वारा निर्धारित प्रश्नों से अधिक प्रश्नों के उत्तर दिये जाते हैं तो उसके द्वारा हल किये गये प्रथमतः यथा निर्दिष्ट प्रश्नोत्तरों का ही मूल्यांकन किया जायेगा।**
3. प्रत्येक प्रश्न के अंक समान हैं। आप के जितने उत्तर सही होंगे, उन्हीं के अनुसार अंक प्रदान किये जायेंगे।
4. सभी उत्तर केवल ओ०एम०आर० उत्तर पत्रक **(O.M.R. ANSWER SHEET)** पर ही दिये जाने हैं। उत्तर पत्रक में निर्धारित स्थान के अलावा अन्यत्र कहीं पर दिया गया उत्तर मान्य नहीं होगा।
5. ओ०एम०आर० उत्तर पत्रक **(O.M.R. ANSWER SHEET)** पर कुछ भी लिखने से पूर्व उसमें दिये गये सभी अनुदेशों को सावधानीपूर्वक पढ़ लिया जाय।
6. परीक्षा समाप्ति के उपरान्त परीक्षार्थी कक्ष निरीक्षक को अपनी प्रश्नपुस्तिका बुकलेट एवं ओ०एम०आर० शीट पृथक–पृथक उपलब्ध कराने के बाद ही परीक्षा कक्ष से प्रस्थान करें।
7. निगेटिव मार्किंग नहीं है।

महत्वपूर्ण : – **प्रश्नपुस्तिका खोलने पर प्रथमतः जॉच कर देख लें कि प्रश्नपुस्तिका के सभी पृष्ठ भलीभॉति छपे हुए हैं। यदि प्रश्नपुस्तिका में कोई कमी हो, तो कक्ष निरीक्षक को दिखाकर उसी सीरीज की दूसरी प्रश्नपुस्तिका प्राप्त कर लें।**

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Rough Work / रफ कार्य

1. Gram positive bacteria are more susceptible to:

   (A) Ampicillin

   (B) Streptomycin

   (C) Tetracycline

   (D) Erythromycin

2. If the mean generation time of an organisms in 30 minutes, what will be cell number in 2 hours if initial count is 50 cells:

   (A) 800

   (B) 1000

   (C) 1200

   (D) 2400

3. The stage of growth phase of bacteria where maximum growth occurs is known as:

   (A) Stationary phage

   (B) Lag phase

   (C) Log phase

   (D) None of the above

4. Measurement of number of viable bacterial cells in culture media can be done by:

   (A) Spectrophotometry

   (B) Plating method

   (C) Turbidometry

   (D) Nephelometry

5. Which of the following methods can be used to quantitatively measure number of cells in a sample?

   (A) Microscopically

   (B) Pour plate and spread place method

   (C) Spectrophotometry

   (D) All of the above

6. Which of the following is a mandate of microbial culture collection center?

(A) Maintenance of cultures

(B) Creating a biodiversity repository

(C) Dissemination of cultures

(D) All of the above

7. Which of the following are not performed in lyophilization?

(A) Agar slant is covered with mineral oil

(B) Cell suspension is frozen at -60 degree to -78degree C

(C) Vials are connected to high-vacuum line

(D) Bacterial sample is dehydrated

8. Nichrome loop wire is used in which of the following techniques?

(A) Pour-plate

(B) Streak-plate

(C) Spread-plate

(D) Roll-tube technique

9. Which of the following are not a contribution by Louis Pasteur?

(A) Germ theory of disease

(B) Pasteurization

(C) Pure culture techniques

(D) Vaccination

10. Which of the following are methods for growing aerobic organisms?

(A) Use of reducing agents in media

(B) Use of candle jar system

(C) Use of orbital shaker or sparger system

(D) Use of paraffin oil

11. Which of the following statements is true regarding the domain archaea?

(A) Cell membrane has ether-linked lipids and pseudopeptidoglycan

(B) Cell membrane has ester-linked lipids and peptidoglycan

(C) Lack presence of introns in genomic content

(D) Metabolism methods are photosynthesis and cellular respiration

12. The most common mode of nutrition in bacteria is:

(A) Chemo heterotrophs

(B) Photoautotrophs

(C) Chemoautotrophs

(D) Lithotrophs

13. Type strain is used for referring to:

(A) Genus

(B) Species

(C) Family

(D) Domain

14. Percentage similarity of one strain to another is calculated by:

(A) DNA hybridization

(B) Protein modelling

(C) Numerical taxonomy

(D) Intuitive method

15. According to Bergey's Manual of Systematics Bacteriology, bacteria without cell wall were classified as:

(A) Firmicutes

(B) Tenericutes

(C) Gracilicutes

(D) Mendosicutes

16. Nitrogen fixing bacteria were identified by:

(A) Winogradsky

(B) Lister

(C) Spallanzani

(D) Pasteur

17. Which of the following is not a contribution of Robert Koch?

(A) Finding a cure for many diseases, including anthrax and tuberculosis

(B) Discovering the cause of tuberculosis

(C) Providing a framework for the study of diseases

(D) Microbiology techniques for growing and studying bacteria

18. Ernst Haeckel is known for his

(A) Biogenesis theory

(B) Koch's postulate

(C) Evolutionary theory

(D) Genetics study

19. Characteristic feature of ascomycetes are:

(A) Coenocytic mycelium and formation of basidia

(B) Septate mycelium and formation of sac

(C) Both of the above

(D) None of the above

20. Swan neck experiment by Louis Pasteur helped disprove the:

(A) Theory of Abiogenesis

(B) Theory of Biogenesis

(C) Theory of Independent assortment

(D) Theory of recapitulation

21. Which type of staining is useful for observation of capsule formation in bacteria?

(A) Simple staining

(B) Differential staining

(C) Negative staining

(D) Cell wall staining

22. Example of vital stain is:

(A) Eosin

(B) Methylene blue

(C) Neutral Red

(D) All of the above

23. How many kingdoms are established as per Whittaker Classification system?

(A) 5

(B) 6

(C) 3

(D) 8

24. Woese classification is based on which of the following relationship?

(A) Phenic

(B) Phylogenetic

(C) Chemic

(D) All of the above

25. Which of the following factors affect microbial growth?

(A) Temperature

(B) pH

(C) Water activity

(D) All of the above

26. Which of the following is an example of strict anaerobic bacteria?

(A) Proteus vulgaris

(B) Clostridium tetani

(C) Staphylococcus aureus

(D) Salmonella typhi

27. Which of the following is used as quality control measure for sterilization by heat?

(A) Wilcox rank test

(B) Brown's tube

(C) Phenol coefficient test

(D) None of the above

28. Which of the following can be sterilized using hot air oven?

(A) Nutrient Media

(B) Glass

(C) Plastic ware

(D) Laboratory coat

29. Which of the following is an important surface active disinfectant?

(A) Amphoteric compound

(B) Cationic compounds

(C) Non-ionic compound

(D) Anionic Compound

30. Bactericidal concentration of phenol is:

(A) 1%

(B) 0.5%

(C) 0.1%

(D) 0.01%

31. All the below are sporicidal in nature except:

(A) Glutaraldehyde

(B) Formaldehyde

(C) Ethyl alcohol

(D) Ethylene oxide

32. The total biomass of an organisms will be determined by the nutrient present in lowest concentration relative to its nutritional requirement is refered to as:

(A) Liebig Law of Minimum

(B) Law of Uncertainty

(C) Law of requirements

(D) Quorum's Law

33. Microbial growth by Standard Place Count is usually quantified as:

(A) Cfu/ml

(B) Pfu/ml

(C) Cells per ml

(D) Optical density

34. Average size of cell in exponential phase is:

(A) Greater than lag phase

(B) Smaller than lag phase

(C) No difference in size

(D) None of the above

35. PPLO stands for:

(A) Plasmid Position Like Organisms

(B) Pneumonia Pharyngitis Lung Organisms

(C) Pleuro Pneumoniae Like Organisms

(D) Pleuro Pseudomonas Like Organisms

36. Cocci which occur as grape shaped clusters are referred to as:

(A) Streptococci

(B) Cryptococci

(C) Pneumococci

(D) Staphylococci

37. What is the mode of antimicrobial action of alcohols?

(A) Protein denaturation

(B) Oxidizing agents

(C) Generation of heat

(D) Generation of ionizing radiation

38. Gram positive bacteria lack which of the following:

(A) Outer membrane

(B) Murein

(C) Teichoic acids

(D) Cell membrane

39. Which of the following can grow in alkaline pH?

(A) Lactobacillus

(B) Shigella

(C) Vibrio

(D) Staphylococcus

40. Concentration of agar added for creating solid media is:

(A) 0.5g%

(B) 1.5g%

(C) 10g%

(D) 5g%

41. Chocolate media is an example of:

(A) Selective and differential media for Staphylococci

(B) Enrichment media

(C) Selective and Differential media for Enterobacteriaceae

(D) Defined Media

42. Media containing crystal violet and sodium deoxycholate will allow growth of:

(A) Gram negative intestinal bacteria

(B) Gram positive intestinal bacteria

(C) Fungi

(D) None of the above

43. Which of the following disinfectants have anti-viral properties?

(A) Hydrogen peroxide

(B) Hypochlorite

(C) Iso propyl alcohol

(D) All of the above

44. Viral capsid is made of repeated protein units known as:

(A) Procapsid

(B) Capsomere

(C) Centromere

(D) None of these

45. The term Microbiology was first coined by:

(A) Anton von Leuwenhoek

(B) Robert Koch

(C) Louis Pasteur

(D) John Tyndall

46. Arrange the processes in the order they occur during a bacterial batch culture:

(i) Lag phase, (ii) Death phase, (iii) stationary phase, (iv) exponential growth phase:

(A) (i), (ii), (iii), (iv)

(B) (i), (iv), (ii), (iii)

(C) (iii), (i), (iv), (ii)

(D) (i), (iv), (iii), (ii)

47. Which of the following is an example of symbiotic relationship between fungi and algae?

(A) Lichen

(B) Mycorrhiza

(C) Rhizobia

(D) All of the above

48. Which of the following distinguishes algae from plants?

(A) Absence of photosynthetic pigments

(B) Absence of vascular tissue

(C) Absence of reserve food materials

(D) All of the above

49. Chemotaxonomy is the classification and identification of micro-organisms based on similarities and differences in their:

(A) Chemical composition

(B) Genetic composition

(C) Both of the above

(D) None of the above

50. The average size of micro-organisms is micrometer which is:

(A) 10^{-6}m

(B) 10^{-9}m

(C) 10^{-2}m

(D) 10^{-3}m

51. What did Anton von Leuwenhoek call the organisms that he first observed through his rudimentary microscope?

(A) Animals

(B) Animalcules

(C) Animalia

(D) Anistamanicules

52. Who is considered as pioneer of antiseptic surgery?

(A) Robert Koch

(B) Louis Pasteur

(C) Charles Darwin

(D) Joseph Lister

53. Chemical agents that are responsible for the killing of fungi are known as:

(A) Fungistatics

(B) Fungicides

(C) Algicides

(D) Bactericides

54. Which of the following techniques is not useful as a long term culture preservation technique?

(A) Agar slants

(B) Cryopreservation

(C) Lyophilization

(D) Glyrcerol Stocks

55. The total magnification of specimen upon observing through 100x objective lens and 15x ocular lens will be:

(A) 115X

(B) 1500 X

(C) 1015X

(D) 100X

56. Which of the following microscopes is not useful for generating contrast for observing live cell samples without staining?

(A) Upright bright field microscope

(B) Fluorescent microscope

(C) Phase contrast Microscope

(D) Inverted Microscope

57. Autoclaving is used for sterilization of objects using moist heat for 20 minutes at:

(A) 121 Degree Celsius at 15 psi

(B) 100 Degree Celsius at 15 psi

(C) 121 Degree Celsius at 20 psi

(D) 100 Degree Celsius at 15 psi

58. Sterlization of oils can be performed using:

(A) Autoclave

(B) Tyndallization

(C) Pasteurization

(D) Hot Air Oven

59. Heat labile substances can be sterilized using

(A) Autoclave

(B) Inspissator

(C) Incinerator

(D) Filtration

60. Which of the following is a gaseous sterilant?

(A) Ethylene Oxide

(B) Glutaraldehyde

(C) Carbolic acid

(D) Cresol

61. Which of the following does not act as inhibitors of cell wall synthesis?

(A) Beta lactam

(B) Cephalosporins

(C) Fluoroquinolones

(D) Glycopeptides

62. Which of the following is an example of Gram positive rod?

(A) Escherichia coli

(B) Pseudomonas aeruginosa

(C) Clostridium botulinum

(D) Vibrio cholera

63. Chemolithotrophs are organisms that can:

(A) Use inorganic compounds as sources of energy and carbon

(B) Use organic compounds as sources of energy and carbon

(C) Both of the above

(D) None of the above

64. Organisms that prefer to grow in the temperature ranges below 15 Degree Celsius are known as:

(A) Psychrotrophs

(B) Psychrophiles

(C) Mesophiles

(D) Thermophiles

65. Fungi prefer to grow in media that is:

(A) Rich in sugar and acidic in nature

(B) Rich in nitrogen and alkaline in nature

(C) Rich in phosphorous and magnesium

(D) Basin nature

66. The term bacteria was given by:

(A) Ehrenberg

(B) Pasteur

(C) Robert Koch

(D) Kornberg

67. Autoclave was invented by:

(A) Winogradsky

(B) Beijerinck

(C) Chamberland

(D) Pasteur

68. Which of the following is NOT a domain in Woese and Fox's phylogenetic tree?

(A) Plantae

(B) Bacteria

(C) Archaea

(D) Eukarya

69. Which of the following is the standard resource for identifying bacteria?

(A) Systema Naturae

(B) Bergey's Manual of Determinative Bacteriology

(C) Haeckel's General Morphology of Organisms

(D) None of the above

70. In which bacterial growth phase would you observe the most endospores in a Bacillus cell culture?

(A) Death phase

(B) Lag phase

(C) Log phase

(D) Log, lag, and death phases would all have roughly the same number of endospores

71. Bacteria that grows in acidic hot spring can be characterized as:

(A) Alkalophile, mesophile

(B) Acidophile, thermophile

(C) Acidophile, mesotrophs

(D) Alkaliphile, thermotroph

72. The decimal reduction time refers to the amount of time it takes to which of the following?

(A) Reduce a microbial population by 10%

(B) Reduce a microbial population by 0.1%

(C) Reduce a microbial population by 90%

(D) Completely eliminate a microbial population

73. The time required to kill all of the microbes within a sample at a given temperature is called as?

(A) D-value

(B) Thermal death point

(C) Thermal death time

(D) Decimal reduction time

74. Bleach is an example of which group of chemicals used for disinfection?

(A) Heavy metals

(B) Halogens

(C) Quaternary ammonium compounds

(D) Phenolics

75. Which type of test is used to determine whether disinfectant solutions actively used in a clinical setting are being used correctly?

(A) Disk-diffusion assay

(B) Phenol coefficient test

(C) In-use test

(D) Use-dilution test

76. Which of the following is acellular intracellular obligate pathogen?

(A) Mycoplasma

(B) Slime mold

(C) Viruses

(D) Yeasts

77. Infectious RNA without outer proteinaceous covering is known as:

(A) Virion

(B) Viroid

(C) Virus

(D) Virucide

78. Y to M shift can be observed in:

(A) Bacillus subtilis

(B) Candida albicans

(C) Tobacco Mosaic Virus

(D) Entamoeba histolytica

79. Vegetative stage characterized by multinucleate diploid ameboid mass called a plasmodium is observed in:

(A) Acellular slime molds

(B) Cellular slime molds

(C) Yeast

(D) Algae

80. Molecular taxonomy uses which of the following as conserved regions for bacterial taxonomy:

(A) 16s rDNA

(B) 18S rDNA

(C) Both of the above

(D) None of the above

81. Agar is derived from which of the following organisms:

(A) Rhodophycophyta

(B) Chlorophycophyta

(C) Chrysophycophyta

(D) Pyrrophycophyta

82. Which of the following does a prokaryotic cell lack?

(A) Ribosomes

(B) Metabolic processes

(C) Nucleic acid

(D) Mitochondria

83. Name the bacteria that can use methane as sole source of energy:

(A) Methanogens

(B) Methanophiles

(C) Methanotrophs

(D) Capnophiles

84. Organisms capable of obtaining C requirement by fixing atmospheric carbon are referred to as:

(A) Heterotrophs

(B) Autotrophs

(C) Chemotrophs

(D) All of the above

85. Characteristics of continuous culture system include:

(A) Closed system

(B) Open system

(C) Semi closed system

(D) None of the above

86. Classification of Algae is based on?

(A) Types of reserve storage granules

(B) Types of photosynthetic pigments

(C) Cell wall material

(D) All of the above

87. Fungal cell wall is composed of:

(A) Chitin

(B) Cellulose

(C) Starch

(D) Laminin

88. Which of the following techniques are not used for generating synchronous culture?

(A) Helmscutter

(B) Nutrition deficiency

(C) Temperature Shock

(D) Nephelometry

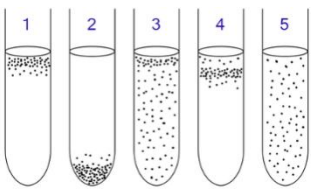
89. Which of the following techniques can be used for obtaining pure culture sample?

(A) Streaking

(B) Flaming

(C) Staining

(D) Fixing

90. 

In the above figure, tube no 4 represents:

(A) Obligate aerobes

(B) Microaerophiles

(C) Facultative aerobes

(D) Facultative anaerobes

91. Which of the following is true regarding growth types of organisms in tube 3 and tube 5 in above given figure?

(A) In Tube 3, Facultative anaerobes can grow with or without oxygen because they can metabolise energy aerobically or anaerobically

(B) In tube 3, Aerotolerant organisms do not require oxygen as they metabolise energy anaerobically

(C) In Tube 5, Facultative anaerobes can grow with or without oxygen because they can metabolise energy aerobically or anaerobically

(D) In tube 5, Aerotolerant organisms require oxygen as they metabolise energy anaerobically

92. Example of a differential and enrichment media is:

(A) Blood agar

(B) Nutrient Agar

(C) Dextrose Agar

(D) Trypticase Soy Agar

93. Mass sterilization of disposable plasticware can be sterilize using:

(A) Gamma radiation

(B) X ray

(C) UV rays

(D) None of the above

94. In the growth equation: n = 3.3 (log10 N – log10 No), n stands for:

(A) Total population

(B) Initial population

(C) Number of generations

(D) Growth constant

95. Growth of bacterial population follows:

(A) Arithmetic progression

(B) Geometric progression

(C) Both of the above

(D) None of the above

96. The generation time for E.coli under optimal conditions is _____.

(A) 20 minutes

(B) 35 minutes

(C) 2 minutes

(D) 13 minutes

97. What is the correct order of staining reagents in Gram-Staining?

(A) Crystal violet, alcohol, iodine solution, safranin

(B) Crystal violet, iodine solution, alcohol, safranin

(C) Crystal violet, safranin, alcohol, iodine solution

(D) Iodine solution, crystal violet, alcohol, safranin

98. Which bacteria appears purple-violet colour after staining?

(A) Gram-positive

(B) Gram-negative

(C) Both Gram-positive and Gram-negative

(D) Neither Gram-positive nor Gram-negative

99. In Gram-staining, iodine is used as a _____.

(A) Fixative

(B) Mordant

(C) Solublizer

(D) Stain

100. Which of the following are true for Gram-negative bacteria?

(A) Upon alcohol treatment, the permeability of the cell wall increases

(B) Crystal violet-iodine (CV-I) complex is extracted

(C) Pore size decreases and the CV-I complex cannot be extracted

(D) Alcohol treatment increases the permeability of the cell wall and the CV-I complex can be extracted

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DO NOT OPEN THE QUESTION BOOKLET UNTIL ASKED TO DO SO

1. Examinee should enter his / her roll number, subject and Question Booklet Series correctly in the O.M.R. sheet, the examinee will be responsible for the error he / she has made.
2. **This Question Booklet contains 100 questions, out of which only 75 Question are to be Answered by the examinee. Every question has 4 options and only one of them is correct. The answer which seems correct to you, darken that option number in your Answer Booklet (O.M.R ANSWER SHEET) completely with black or blue ball point pen. If any examinee will mark more than one answer of a particular question, then the first most option will be considered valid.**
3. Every question has same marks. Every question you attempt correctly, marks will be given according to that.
4. Every answer should be marked only on Answer Booklet **(O.M.R ANSWER SHEET).**Answer marked anywhere else other than the determined place will not be considered valid.
5. Please read all the instructions carefully before attempting anything on Answer Booklet**(O.M.R ANSWER SHEET).**
6. After completion of examination please hand over the Answer Booklet **(O.M.R ANSWER SHEET)** to the Examiner before leaving the examination room.
7. There is no negative marking.

Note: On opening the question booklet, first check that all the pages of the question booklet are printed properly in case there is an issue please ask the examiner to change the booklet of same series and get another one.