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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
C

M.Sc (Biochemistry) First Semester, Examination, February/March-2022
BCH-1004
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. What are the scientific challenges for the development of HIV vaccine?

   (A) Genetic diversity

   (B) Formation of neutralizing antibodies

   (C) Lack of a proper animal model for pre-clinical testing

   (D) All of these

2. Which of the following statements are true regarding polio vaccines?

   (A) Salk and Sabin are polio vaccines

   (B) Sabin is an inactivated polio vaccine

   (C) Salk is live attenuated polio vaccine

   (D) All of these

3. The process of weakening a pathogen is called:

   (A) Vaccination

   (B) Attenuation

   (C) Immunization

   (D) Virulence reduction

4. Which of the following is not the function of reverse transcriptase?

   (A) Exonuclease

   (B) RNA dependent RNA polymerase

   (C) RNA dependent DNA polymerase

   (D) RNase H

5. The successful anti-cancer HPV vaccine consists of:

   (A) Live virus attenuated by specific mutagenesis

   (B) Whole virus chemically inactivated vaccine

   (C) Self-assemble of virus L1 protein into VLP

   (D) Sub unit chemically inactivated vaccine

6. Rous sarcoma virus is:

(A) Deoxyribonucleic Acid (DNA) Tumor virus

(B) Ribonucleic Acid (RNA) Tumor virus

(C) Enveloped viruses

(D) Naked viruses

7. Migration of cancerous cells from the site of origin to other part of the body forming secondary tumors is called _____.

(A) Diapedesis

(B) Metastasis

(C) Proliferation

(D) Apoptosis

8. Proto-oncogenes can be transformed to oncogenes by all of the following mechanisms except:

(A) Elimination of their start signals for translation

(B) During a viral infection cycle

(C) Chromosomal rearrangements

(D) Chemically induced mutagenesis

9. Which organ does hepatitis affect?

(A) Liver

(B) Lungs

(C) Intestine

(D) Heart

10. Which disease is not caused by persistent virus infections:

(A) Acquired immune deficiency syndrome

(B) Hepatitis

(C) Ebola

(D) AIDS-related complexes

11. Select the principal means by which antigenic shift occurs in influenza A virus:

(A) Low fidelity of DNA dependent DNA polymerase

(B) Low fidelity of RNA dependent RNA polymerase

(C) Reassortment of fragments of the RNA genome

(D) Recombination between RNA genomes

12. True about HIV is:

(A) RNA virus

(B) Diploid genome

(C) Gag is gene coding for structural protein

(D) All are true

13. What is the function of the T-antigen of SV40 viral vectors?

(A) Genome replication

(B) Translation

(C) Transcription

(D) Conjugation

14. A quasi species virus such as influenza and HIV has which of the following characteristics?

(A) A fragmented or segmented genome

(B) Co-existence of innumerable genetic variants

(C) Possesses RNA and DNA

(D) A very large genome

15. Positive stranded RNA viruses have which of the following characteristics?

(A) Negative strand act as template for repeated transcription of progeny positive strands

(B) Their genome RNA can be translated directly as mRNA

(C) Positive strand RNA viruses are the single largest group of RNA viruses with 30 families

(D) All of these

16. Which of the following is used as a vector in genetic engineering?

(A) Bacteriophage

(B) Plasmid

(C) Plasmodium

(D) Both (A) and (B)

17. Why are bacteriophages important for scientific research?

(A) Alternatives to antibiotics for many antibiotic resistant bacterial strains

(B) Phage therapy and phage display

(C) Targeted gene and drug delivery

(D) All of these

18. Which of the following statements are true about a virion?

(A) Lytic phage

(B) Lysogenic phage

(C) The viral capsid

(D) An infectious and fully formed viral particle

19. Which type of E.coli strain was used by Lederberg and Tatam to prove the conjugation?

(A) Auxotroph

(B) Prototroph

(C) Photoautotroph

(D) Chemotroph

20. The spike-like projections on the viral capsid are known as:

(A) Viriod

(B) Proteomes

(C) Peplomers

(D) Capsomeres

21. Fusion of protoplasts cannot be induced by:

(A) Polyethylene glycol

(B) Ca++

(C) Electrofusion

(D) Gum Arabic

22. The difference between transfection and transduction is:

(A) In transfection, the transgene is inserted in a plasmid, while in transduction, the transgene is inserted in a viral genome.

(B) Transfection involves the transfer of naked DNA into the cell while transduction involves packaging the DNA into a virus particle, which then infects the cell.

(C) Both (A) and (B)

(D) There is no difference - the terms are synonymous

23. What is not true about adaptive mutation:

(A) Depend on the relative or absolute fitness of individuals within a population.

(B) Adaptive mutations spontaneously occur during periods of prolonged stress.

(C) Primarily random mutation

(D) Specific to the environmental challenge

24. Replication of −ssRNA genomes involves:

(A) RNA-dependent RNA polymerase

(B) Methlytransferase

(C) Reverse transcriptase

(D) Both (A) and (B)

25. Which of the following process occurs between DNA molecules of very similar sequences?

(A) Homologous genetic recombination

(B) Site specific recombination

(C) Non-homologous recombination

(D) Replicative recombination

26. Phage display technique makes use of which of the following vectors?

(A) M13

(B) Lambda

(C) 2 micron circle

(D) BAC

27. The substitution that prematurely stops the synthesis of protein by generation stop codon is known as:

(A) Nonsense mutation

(B) Missense mutation

(C) Frame shift mutation

(D) Alteration

28. In bacteria, sporulation takes place in this growth phase

(A) Phase of decline

(B) Log phase

(C) Lag phase

(D) Stationary phase

29. An acute viral infection is characterized by:

(A) Sudden or rapid onset of disease

(B) Robust innate immune responses

(C) Lasts only a week or two

(D) All of these

30. Vaccines have been developed to protect against which hepatitis viruses?

(A) A

(B) B

(C) D

(D) (A) and (B)

31. Which of the following is negatively stranded RNA viruses?

(A) Rhabdoviruses

(B) Coronaviruses

(C) HIV

(D) Picornaviruses

32. In which phase of growth does the recipient cell take up the donor DNA?

(A) Lag phase

(B) Early logarithmic phage

(C) Late logarithmic phage

(D) Stationary phage

33. Important examples of +ssRNA viruses are:

(A) SARS CoV-2

(B) Polio virus

(C) SV40

(D) Both (A) and (B)

34. Peptidoglycan synthesis not involves:

(A) ATP

(B) NADH

(C) Bactoprenol

(D) Uridine diphosphate

35. Introduction of DNA into cells via liposomes is known as:

(A) Lipofection

(B) Protoplast fusion

(C) Electroporation

(D) Electrophoresis

36. Programmed cell death is termed as _____.

(A) Metastasis

(B) Apoptosis

(C) Proliferation

(D) Mitotic termination

37. What is associated with mating types in fungi?

(A) Homothallism

(B) Heterothallism

(C) None of these

(D) Both of these

38. Which of the following statements are true about the capsomeres?

(A) It is an individual unit of the capsid

(B) It is a viral protein for replication

(C) It is a unit of nucleic acid in viruses

(D) All of the above

39. When food spoils, its texture become slimy because of:

(A) Development of nitrogenous compounds

(B) Chlorophyll breakdown

(C) Development of sulfides

(D) Surface accumulation of microbial cells

40. Endospore are all of the following except _____ as compared to vegetative cells.

(A) More likely to survive treatment with disinfectants

(B) More resistant to staining

(C) More likely to die in nutritionally poor conditions

(D) More resistant to temperature changes

41. Sequence of steps involve in protoplast fusion.

(A) Decomposition of cell wall, isolation of protoplasts, chemical fusion, regeneration

(B) Isolation of protoplasts, decomposition of cell wall, regeneration, electrofusion

(C) Decomposition of cell wall, isolation of protoplasts, electrofusion,regeneration

(D) Both (A) and (B)

42. What is an example of food spoilage?

(A) Mold on bread

(B) Milk become chunky and turning sour

(C) Fruit turning brown

(D) Vegetables turning brown after cooking them for a short period of time

43. What helps in the heat resistance of the endospore?

(A) Calcium-DPA complex

(B) Water

(C) Methylene

(D) Calcium

44. The amount of ATP produced by a cell from glucose when metabolizing it by fermentation means is:

(A) Greater than by aerobic metabolism

(B) Lesser than by aerobic metabolism

(C) Exactly or approximately equal to by aerobic metabolism

(D) None of these

45. Which of the following things was identified as the transforming principle?

(A) DNA

(B) RNA

(C) Proteins

(D) Carbohydrates

46. How many oxygen molecules are required in the fermentation of one molecule of glucose to ethanol and CO_2?

(A) 0

(B) 1

(C) 2

(D) 36

47. Which of the following products is made during Embden-Meyerhof glycolysis?

(A) NAD^+

(B) Pyruvate

(C) CO_2

(D) Two-carbon acetyl

48. Which of the following is a characteristic of beef extract?

(A) Product resulting from the digestion of proteinaceous materials

(B) Aqueous extract of lean beef tissue

(C) Aqueous extract of yeast cells

(D) Complex carbohydrate obtained from certain marine algae

49. An icosahedral capsid consists of_____.

(A) Hexagonal capsomeres

(B) Pentagonal capsomeres

(C) Triangular capsomeres

(D) Both (A) and (B)

50. During which of the following is ATP not made by substrate-level phosphorylation?

(A) Embden-Meyerhof pathway

(B) Calvin cycle

(C) Krebs cycle

(D) Entner-Doudoroff pathway

51. When the phage transduces only those bacterial genes adjacent to the prophage in the bacterial chromosome then it is known as?

(A) Generalized transduction

(B) Restricted transduction

(C) Specialized transduction

(D) Conjugation

52. Which of the following molecules is reduced?

(A) NAD^+

(B) FAD

(C) O_2

(D) NADPH

53. Exponential growth in bacteria would be expected during which phase of growth?
(A) Log phase
(B) Lag phase
(C) Death phase
(D) Stationary phase

54. Cellulase enzyme in isolation of protoplast is used:
(A) To degrade proteins
(B) To degrade cellulose
(C) To degrade pectin
(D) To degrade hemicellulose

55. Bacteriophages that induce bacterial cell lysis are called_____.
(A) Viroids
(B) Lysogenic phages
(C) Virulent phages
(D) Temperate phages

56. The electron acceptor in the anaerobic conditions in prokaryotes is?
(A) Fattyacids
(B) Glucose, fructose
(C) SO_4^{-2}
(D) Antioxidants

57. What statement is not true for endospore core?
(A) Core contains (10-25%) water
(B) Contains high percentage of small acid soluble protein (SASP)
(C) Core contain some DNA repair enzymes
(D) Core contains loosely arranged peptidoglycan

58. Neoplasia means:
(A) Disturbance in cellular growth
(B) Disturbance in cellular differentiation
(C) Disturbance in both cellular growth and differentiation
(D) All of the above

59. What are the characteristics of rough pneumococci strain?
(A) Noncapsulated and nonpathogenic
(B) Noncapsulated and pathogenic
(C) Capsulated and pathogenic
(D) Capsulated and non-pathogenic

60. Under which phase of growth bacteria increases their size but do not divide?
(A) Stationary phase
(B) Lag phase
(C) Log phase
(D) Death phase

61. The germination of endospore not involves:
(A) Activation of endospore
(B) Loose of resistance to heat
(C) Loose of water
(D) Rupture of spore coat

62. When viral genome can become integrated into the bacterial genome they are known as:
(A) Temperate phage
(B) Prophage
(C) Bacteriophage
(D) Episome

63. Which of the following is not used to determine DNA relatedness in the phylogenetic system?
(A) Thermal stability of related DNA
(B) Genome size
(C) GC content
(D) Amino acid sequences

64. Which among the following compound when added to cytoplasmic membrane helps in maintaining the rigidity of cell?

(A) Lipopolysaccharide

(B) Hopanoid

(C) Phosphoglycerides

(D) Amino acids

65. Purple and green non-sulfur bacteria belongs to which of the following classes?

(A) Photolithoautotrophy

(B) Photoorganohetrotrophy

(C) Chemolithoautotrophy

(D) Chemoorganohetrotrophy

66. Which of the following is true for the most important form of DNA damage which produces pyrimidine dimers from adjacent pyrimidine bases?

(A) X ray

(B) 5 bromo uracil

(C) UV light

(D) Acridine orange

67. Which of the following is true for an $Hfr \times F^{-} cross$?

(A) Frequency of recombination high, transfer of F factor low

(B) Frequency of recombination high, transfer of F factor high

(C) Frequency of recombination low, transfer of F factor high

(D) Frequency of recombination low, transfer of F factor low

68. Poly-beta-hydroxybutyrate (PHB) present in aerobic bacteria can serve as?

(A) A reserve carbon and energy source

(B) A reserve source of phosphate

(C) Acceptor of oxygen

(D) Provides buoyancy

69. Does reducing the pH of food lower the chances of food spoilage? If so why?

(A) No

(B) Yes because with a lower pH it is able to slow down the microbes

(C) Yes, because a lower pH prevents microbes from growing

(D) Yes, increases the growth of beneficial bacteria

70. Ribosomes of prokaryotes have a sedimentation coefficient of?

(A) 90S

(B) 80S

(C) 50S

(D) 70S

71. Assembly is a vital late replication stage for a virus and is often accomplished by which of the following?

(A) Use of cellular scaffolding in the nucleus and cytoplasm

(B) Snatching cellular lipids and membranes

(C) Master plan embedded in the viral genome

(D) Random interactions between cellular and virus proteins

72. F pilus has a major role as _____.

(A) Motility of the cell

(B) Port of entry of genetic material during mating

(C) Attachment to host cell

(D) Human infection

73. What are the of overlapping persistent virus-host interaction:

(A) Slow infections

(B) Latent

(C) Chronic

(D) All of these

74. Baltimore classification is based on importance of:

(A) DNA

(B) mRNA

(C) rRNA

(D) tRNA

75. A cell might perform anaerobic respiration for which of the following reasons?

(A) It lacks glucose for degradation.

(B) It lacks the transition reaction to convert pyruvate to acetyl-Co(A)

(C) It lacks Krebs cycle enzymes for processing acetyl-CoA to CO_2

(D) It lacks a cytochrome oxidase for passing electrons to oxygen

76. The L Ring in Gram-Negative bacterium flagella is associated with _____.

(A) Peptidogycan

(B) Outer Membrane

(C) Cytoplasmic Membrane

(D) Cell Membrane

77. The cell in which the F factor carries along with it some chromosomal genes are known as:

(A) F^+ cell

(B) F^- cell

(C) F‴ cell

(D) F′ cell

78. Bacteria with less than a complete twist or comma shaped is known as?

(A) Spirilla

(B) Helical

(C) Vibrioid

(D) Spirochetes

79. 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

80. Two organisms which are very closely related to each other have which of the following property?

(A) Similar mol% G+C values

(B) Different mol% G+C values

(C) Similar mol% G+C values and heteroduplexes are formed

(D) Different mol% G+C values and heteroduplexes are not formed

81. A common polyhedral capsid shape of viruses is a:

(A) Pentagon

(B) Cube

(C) Icosahedron

(D) Pyramid

82. What does 'Perfect stage' of a fungus indicate?

(A) Indicates that it can reproduce asexually

(B) Indicates that it is perfectly healthy

(C) Indicates that it is able to form perfect sexual spores

(D) All of the above

83. Retroviruses genome contains which of the characteristic sequence:

(A) LTRs

(B) SINE

(C) Transposons

(D) LINE

84. Which fungi division includes 'Club fungi'?

(A) Zygomycota

(B) Deuteromycota

(C) Basidiomycota

(D) Ascomycota

85. Subunit vaccine is all, Except:

(A) A whole purified virus

(B) A purified part or pieces of the antigen

(C) An expensive type of vaccine

(D) A Hepatitis-B vaccine

86. Which of the following features differs archaebacteria from eubacteria?

(A) Cell membrane structure

(B) Mode of nutrition

(C) Mode of reproduction

(D) Cell shape

87. Simian Virus 40 (SV40) is an example of _____.

(A) Caulimovirus

(B) Polyomavirus

(C) Plant virus

(D) Retrovirus

88. This about cell wall of gram-positive bacteria is true:

(A) Cell wall comprises of many layers

(B) The cell wall is thicker than the associated gram-negative bacteria

(C) Cell wall comprises of teichoic acids

(D) All of the above

89. The transfer of genes from one cell to another by a bacteriophage is known as:

(A) Recombination

(B) Conjugation

(C) Transduction

(D) Transformation

90. Which of the following is not a name for the cycle resulting in the conversion of a two-carbon acetyl to one ATP, two CO_2, one $FADH_2$, and three NADH molecules?

(A) Krebs cycle

(B) Tricarboxylic acid cycle

(C) Calvin cycle

(D) Citric acid cycle

91. Protoplast fusion technique used for:

(A) Delivery of multiple plasmids with high levels of co-transformation

(B) No binary vector required

(C) High frequency transformation

(D) All of these

92. The first scientifically approved vaccine was_____.

(A) Oral polio vaccine

(B) Smallpox vaccine

(C) MMR vaccine (measles, mumps, and rubella)

(D) Tetanus vaccine

93. Which property of p53 enables it to prevent the development of cancer?

(A) It is a transcription factor that causes protein production which stimulates the cell cycle

(B) It prevents replication of cells with damaged DNA

(C) It prevents cells from triggering apoptosis

(D) It stimulates synthesis of DNA repair enzymes that replace telomere sequence lost during cell division

94. The undesirable change in a food that makes it unsafe for human consumption is referred to as:

(A) Food decay

(B) Food loss

(C) Food spoilage

(D) All of these

95. Flagella in bacteria enable them to:

(A) Reproduce

(B) Locomote

(C) Thrive in nutrient agar

(D) Adhere to tissue surfaces

96. Which scientist proposed adding a kingdom for protists?

(A) Carolus Linnaeus

(B) Carl Woese

(C) Robert Whittaker

(D) Ernst Haeckel

97. Glucose can be broken down to pyruvate by?

(A) Entber-Doudoroff Pathway

(B) Tricarboxylic acid cycle

(C) Both (A) and (B)

(D) None of these

98. The replicative intermediate of a positive RNA virus is:

(A) The mRNA

(B) The same as the genornic RNA

(C) Identical to the progeny RNA

(D) Negative RNA

99. Growth of microbes in a solid media is identified by the formation of?

(A) Pellicle at the top of media

(B) Colonies

(C) Sediment at the bottom

(D) Turbidity

100. Lipopolysaccharide in cell walls is characteristic of?

(A) Gram-positive bacteria

(B) Gram-negative bacteria

(C) Fungi

(D) Algae

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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.
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6. After completion of examination please hand over the Answer Booklet **(O.M.R ANSWER SHEET)** to the Examiner before leaving the examination room.
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