

SCIENTIFIC ASSISTANT - MICROBIOLOGY

1. **Foaming problem in a fermentation industry can be avoided by :**

- 1) Formulating media in such a way to facilitate less foam production
2) Use of mechanical breakers
3) Use of antifoaming agents
4) All the above

2. **Assertion (A) : For industrial sterilization, steam is preferred to other agents. Reason (R) : Steam can penetrate into awkward sites, as in valves, for efficient sterilization.**

- 1) Both (A) and (R) are true and (R) is the correct explanation of (A)
2) Both (A) and (R) are true but (R) is not the correct explanation of (A)
3) (A) is true but (R) is false
4) (A) is false but (R) is true

3. **In industrial ethanol production, *Saccharomyces* species is responsible for alcoholic fermentation, of which :**

- 1) *S.cerevisiae* is a fermenter yeast, while *S.carlsbergensis* is a non-fermenter yeast
2) *S.cerevisiae* is a non-fermenter yeast, while *S.carlsbergensis* is a fermenter yeast
3) *S.cerevisiae* is a top fermenter yeast, while *S.carlsbergensis* is a bottom fermenter yeast
4) *S.cerevisiae* is a bottom fermenter yeast, while *S.carlsbergensis* is a top fermenter yeast

4. **Direct bacterial leaching differs from indirect bacterial leaching by : (i) Direct leaching involves direct contact whereas indirect leaching involves no contact (ii) Indirect leaching method involves production of leaching agents by microbes to oxidise minerals (iii) Direct method involves limited steps whereas indirect method involves several enzyme catalyzed steps (iv) Both method involves same process except physical contact**

- 1) (i) alone is correct
2) (i) and (ii) are correct
3) (i), (ii) and (iii) are correct
4) All are correct

5. **Substance that causes rise in body temperature :**

- 1) Antigen
2) Antibody
3) Pyrogen
4) None of the above

6. **Which one of the following is the controlling organization for food borne infections?**

- 1) GTP
2) GAP
3) FDA
4) HACCP

7. **Vinegar is made from the conversion of :**

- 1) Acetic acid
2) Glycerol
3) Carboxy acetate
4) Acetyl chloride

8. **Consider the following statements : Assertion (A) : The alcohol yield depends on the amount of protein present in the substrates. Reason (R) : Ethanol can be generated from residues having high sugar content. Now select the answer according to the coding system given below :**

- 1) (A) is true, but (R) is false
2) Both (A) and (R) are false
3) Both (A) and (R) are true but (R) is not the correct explanation of (A)
4) (A) is false, but (R) is true

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9. A substance obtained from the mushrooms *Amanita pantherina* and *A. muscaria*

is :

- 1) Ibotenic acid
 2) Hypoxin
 3) Immunoglobulin
 4) All the above

10. The pigment in green algae which trap light and split water into 2 protons, 2 electrons and one $\frac{1}{2} O_2$ is :

- 1) Chlorophyll
 2) Xanthophyll
 3) Carotenoid
 4) Phycocyanin

11. Removal of bacteria in milk by centrifugation is called :

- 1) Bacteriofication
 2) Bacterial fuge
 3) Bactofication
 4) All the above

12. Match List-I with List-II

List - I	List - II
a. Electrolysis	1. Splitting of water by heat
b. Thermolysis	2. Electrical splitting
c. Thermo-chemical lysis	3. Splitting of water by light
d. Photolysis	4. Splitting of water by both heat and chemical catalysis

	a	b	c	d
A.	4	3	1	2
B.	2	1	4	3
C.	2	4	3	1
D.	4	3	2	1

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13. Which of the following is a free living N_2 fixer?

- 1) *Azospirillum*
 2) *Azotobacter*
 3) *Azolla*
 4) *Rhizobium*

14. LJ medium is used for the culture of :

- 1) Actinomycetes
 2) *Staphylococcus aureus*
 3) Tubercle bacilli
 4) Anaerobic organisms

15. Which of the following system kills yeast and mold in milk?

- 1) Ultrapasteurization
 2) Low temperature long time
 3) High temperature short time
 4) Very high temperature

16. The quantities which can be measured in whole integral values and never fractional value is termed as : (i) Discrete variable (ii) Discontinuous variable (iii) Meristic variable (iv) Continuous variable

- 1) (i) alone is correct
 2) (i) and (ii) are correct
 3) (i), (ii) and (iii) are correct
 4) All are correct

17. Difference in refractive index and cell density is converted into variation in light intensity in :

- 1) Bright field microscopy
 2) Dark field microscopy
 3) Phase contrast microscopy
 4) Electron microscopy

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18. An examination of the interactions of microbial communities within sewage or estimating soil respiration by measuring amount of CO₂ released is an example for :
- 1) Autecological study
 - 2) Synecological study
 - 3) Biomarker analysis study
 - 4) None of the above
19. Which pre-requisite should be considered for Monoclonal antibody formation?
- 1) Myeloma cells genetically defective for the enzyme Hypoxanthine-guanine phosphoribosyl transferase
 - 2) Myeloma cells that did not produce antibody molecules
 - 3) Myeloma cells unable to grow in aminopterin containing HAT medium
 - 4) All the above
20. Thermococci are :
- 1) Strict anaerobes
 - 2) Reduce sulphur to sulfide
 - 3) Motile
 - 4) All the above
21. Francesco Redi is famous for his experiments with :
- 1) Swan neck flask
 - 2) Vaccination
 - 3) Maggots and meat
 - 4) Microscope lenses
22. Group translocation :
- 1) Transported compound is chemically altered
 - 2) Substrates transported include purines, pyrimidines and fatty acids
 - 3) Phosphotransferase system is an example of group translocation involving the transport of sugars into cell.
 - 4) All of the above
23. A live attenuated vaccine for Tuberculosis :
- 1) DPT
 - 2) BCG
 - 3) Tuberculin
 - 4) PPD
24. Initial attempts of pesticide degradation by plasmid-mediated GEM were reported by :
- 1) Chakrabarty et al (1981)
 - 2) Sims et al (1990)
 - 3) Nagate et al (1993)
 - 4) Srivastava et al (1995)
25. Which one of the following is correctly matched?
- 1) Cellulose - cloths
 - 2) Starch - thread
 - 3) Lignin - food
 - 4) Fructose - fibre
26. IgG antibodies against self proteins :
- 1) are only found in patients with tumours
 - 2) are only produced in the spleen
 - 3) can cross the placenta
 - 4) are more common in man
27. The nucleotide dimer caused by UV light is :
- 1) Cytosine dimers
 - 2) Thymine dimers
 - 3) Adenine dimers
 - 4) Guanine dimers
28. The first transmission electron microscope was made by :
- 1) Lederberg
 - 2) Tatum
 - 3) Fleming
 - 4) Ruska

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29. **Standard PCR amplification is not efficient if sequences are much longer than -**
~~1) 3 kb~~ 2) 10 kb
3) 20 kb 4) 100 kb
30. **Lichens are :**
1) Bacteria 2) Fungi
3) Algae ~~4) None of the above~~
31. **Linezolid belongs to the class of antibiotics called :**
~~1) Oxazolidinones~~ 2) Streptogramins
3) Glycylcyclines 4) Lincomycins
32. **Acetogenic bacteria :**
~~1) Condensation of two CO₂ molecules to form acetic acid~~ 2) Breakdown of acetic acid
3) Condensation of 2 molecules of acetic acid 4) None of the above
33. **The stationary phase of chromatography is a :**
1) Solid 2) Gel
3) Solid-liquid mixture ~~4) All the above~~
34. **Basic unit of Lignin is :**
1) N-acetyl glucosamine ~~2) Phenyl propene~~
3) Glucose 4) Fatty acid
35. **Outer membrane of gram negative bacteria is :**
~~1) Braun's lipoprotein~~ 2) Teichoic acid
3) Coagulase 4) None of the above
36. **ELISA assay :**
~~1) results in cell lysis~~ 2) uses a radiolabelled second antibody
~~3) involves addition of substrate which is converted to a coloured end-product~~ 4) requires sensitized red blood cells
37. **Lac operon is an example for :**
~~1) Inducible operon~~ 2) Suppressed operon
3) Attenuator operon 4) Transition operon
38. **Pectin is mainly degraded by :**
~~1) *Fusarium* sp.~~ 2) *Aspergillus* sp.
3) *Penicillium* sp. 4) *Myrothesium* sp.
39. **Which of the following is a predominant microorganism in milk?**
1) Fungi ~~2) Bacteria~~
3) Actinomycetes 4) Virus
40. **The resulting molecule of gene manipulation are called : 1. Cloned DNA 2. Recombinant DNA 3. Chimeras 4. Composite molecules Choose your answers from below :**
1) 1 and 3 are correct 2) 2 and 4 are correct
3) 1 and 2 are correct ~~4) All are correct~~

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41. Positional average does not include :

- ~~1) Mean~~ 2) Median
- 3) Mode 4) Quartiles

42. Choose the correct interaction relationship :

- 1) *Paramecium* and *Chlorella* can never host each other
- 2) *Paramecium* and *Chlorella* can host each other in either way
- ~~3) *Paramecium* hosts *Chlorella* within its cytoplasm~~
- 4) *Chlorella* hosts *Paramecium* within its cytoplasm

43. The presence of viable bacteria in the blood :

- 1) Septicemia
- ~~2) Bacteremia~~
- 3) Hemorrhage
- 4) Multicemia

44. In soil : (i) Organic matter contributes to the soil cations and anions exchange capacity and affects the retention, release and availability of plant nutrients (ii) humus enhances enzymic activity involved in plant metabolism (iii) uptake of trace elements by plants is increased since humus is known to chelate with trace elements like iron (iv) mobilization of N, P and K from the soil into the root is decreased in the presence of humic substances

- 1) (i) alone is correct
- 2) (i) and (ii) are correct
- ~~3) (i), (ii) and (iii) are correct~~
- 4) All are correct

45. Objects which fluoresce have the ability to :

- 1) Absorb light of long wave length
- 2) Absorb visible light
- ~~3) Absorb light of short wave length and give off light of longer wave length~~
- 4) Absorb light of long wave length and give off light of shorter wave length

46. Pencillin was discovered by :

- 1) Ernest Chain
- 2) Howard Florey
- 3) S. Waksman
- ~~4) Alexander Fleming~~

47. Fatty acids are catabolized by :

- ~~1) β - oxidation~~
- 2) EMP Pathway
- 3) ED Pathway
- 4) Krebs cycle

48. Deinococci appear as :

- ~~1) Pairs and tetrads~~
- 2) Bunch of grapes
- 3) Cocci on chain
- 4) None of the above

49. Action of Tetanospasmin

- 1) Damages membranes of erythrocytes and tissue cells
- 2) Is an oxygen labile hemolysin
- ~~3) Causes contraction of muscles~~
- 4) Is a hyaluronidase that aid invasiveness

50. Removal of water content from bacteria is known as :

- 1) Oxidation
- 2) Rehydration
- ~~3) Plasmolysis~~
- 4) None of the above

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51. Monoclonal antibodies produced by hybridoma technology :

- 1) are usually of human origin
- 2) are each the result of immortalization of single monocyte
- 3) usually have specificity predetermined by prior immunization
- 4) are prepared by fusion of T lymphocytes and myeloma cells

52. Kirby Baner method refers to :

- 1) Disk diffusion method
- 2) Dilution method
- 3) Both of above
- 4) Neither of above

53. In HPLC, the type of elution in which the mobile phase strength is unchanged till the entire elution process is called :

- 1) Binary elution
- 2) Isocratic elution
- 3) Gradient elution
- 4) Partial elution

54. The function of the tryptophan in trp operon is :

- 1) Inducer
- 2) Repressor
- 3) Corepressor
- 4) All the above

55. Griffith is known for his work on :

- 1) Transformation
- 2) Conjugation
- 3) Transduction
- 4) Lysozyme

56. Which is not true about antibiotics?

- 1) They are used in animal feeds
- 2) They have the same function as of antibodies to neutralize antigens
- 3) Some have the ability to act as Acid-Base indicators
- 4) The excess antibiotics from the body get excreted out

57. Oxidation ponds are also known as :

- 1) Baloons
- 2) Lagoons
- 3) Lagons
- 4) Bagoons

58. Persons referred to as Carriers are :

- 1) Recovered patients
- 2) Individuals with inapparent infections
- 3) Individuals in incubation
- 4) Can be any of the above

59. To make a solid medium, agar is added at a concentration of :

- 1) 1.5 - 2%
- 2) 3.0 - 4.5%
- 3) 5.0 - 6.5%
- 4) 7.0 - 8.5%

60. Cellulose in plants is mainly associated with :

- 1) Starch
- 2) Lignin
- 3) Protein
- 4) Glucose

61. This organism has peritrichous flagella :

- 1) Pseudomonas
- 2) Proteus
- 3) Vibrio
- 4) None of the above

62. The Fc region of antibody :

- 1) Contains both heavy and light chains
- 2) Is required for antigen binding
- 3) Is not a requirement for placental transmission
- 4) Generally confers biological activity on the various molecules

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63. **Wool is a :**

- ~~1) Animal fibre~~
- 2) Plant fibre
- 3) Mineral fibre
- 4) Wooden fibre

64. **Humus is present in :**

- 1) O horizon but not in A horizon
- 2) A horizon but not in O horizon
- ~~3) Both O and A horizon~~
- 4) O, A and E horizon

65. **Antiseptic principles were first introduced by :**

- ~~1) Joseph Lister~~
- 2) Paul Ehrlich
- 3) Alexander Fleming
- 4) E. Chain

66. **Coliforms in milk produce :**

- 1) Colored pigments
- 2) Lactase
- ~~3) Gas~~
- 4) All the above

67. **This organism can withstand heavy desiccation and radiation :**

- 1) Streptococcus
- 2) Staphylococcus
- ~~3) Deinococcus~~
- 4) None of the above

68. **Considering the relationship between *Paramecium bursaria* and the yeast *Schizosaccharomyces pombe* :**

- ~~1) Former is a predator, latter is a prey species~~
- 2) Latter is a predator, former is a prey species
- 3) Both can predate on each other under favorable conditions
- 4) Cannot exhibit predative interaction

69. **The disease caused by *Pythium debaryanum* -**

- ~~1) Damping off of seedlings~~
- 2) Leaf spots
- 3) Rusts
- 4) Powdery Mildew

70. **The isotopes are elements that share the :**

- ~~1) Same atomic number and different atomic mass~~
- 2) Different atomic number and same atomic mass
- 3) Same atomic number and same atomic mass
- 4) Different atomic number and different atomic mass

71. **The splicing is a mechanism in which the modification of mRNA is by :**

- 1) Removal of exons and joining introns
- ~~2) Removal of introns and joining of exons~~
- 3) Formation of methyl group in the head end
- 4) Formation of Poly A at the tail end

72. **Which of the following is not a type of Chi square test?**

- 1) Goodness of fit
- 2) Contingency chi square
- 3) Homogeneity chi square
- ~~4) Heterogeneity chi square~~

73. **Attack of milk protein by *Micrococcus* and *Bacillus* results into :**

- ~~1) Sweet curdling~~
- 2) Yogurt
- 3) Cheese
- 4) Butter milk

74. **Blue Baby disease is also known as :**

- ~~1) Methanoglobinemia~~
- 2) Leukemia
- 3) Anemia
- 4) None of the above

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75. Consider the following statements : Assertion (A) : Mammalian nuclear transfer made by using a cultured embryonic cell line Reason (R) : Dolly was the first mammal to be generated by nuclear transfer from a differentiated adult cell Select your answers according to the coding scheme given below :

- 1) Both statements are true but (R) is the correct explanation of (A) ~~2) Both statements are true but (R) is not the correct explanation of (A)~~
3) Both statements are false 4) Statement (A) is true but (R) is false

76. PCR was invented by :

- 1) Ruska ~~2) Kary Mullis~~
3) Waksman 4) Griffith

77. What do pentose phosphate pathway, ED pathway and glycolytic pathway have in common?

- 1) Are anabolic pathways 2) Use the same set of enzymes
~~3) Oxidise glucose to pyruvic acid~~ 4) Are fermentation pathways

78. An example of fluoro chrome is :

- ~~1) Auramine~~ 2) Gentian violet
3) Carbol fuchsin 4) Methylene blue

79. Sequence in correct order of the stages in a statistical investigation :

- 1) Organization, Presentation, Collection, Analysis, Interpretation 2) Collection, Presentation, Analysis, Organization, Interpretation
~~3) Collection, Organization, Presentation, Analysis, Interpretation~~ 4) Collection, Organization, Analysis, Interpretation, Presentation

80. The enzyme used commonly in ELISA is :

- ~~1) Peroxidase and phosphatase~~ 2) Lipase and Protease
3) Amylase and Invertase 4) Reverse transcriptase

81. Degradation of cellulosic fibre is fastest in :

- 1) Anaerobic condition ~~2) Aerobic condition~~
3) Semi aerobic condition 4) Semi anaerobic condition

82. According to Allee's principle, within a single population : (i) Both positive and negative interactions may occur (ii) Positive interaction predominates at low population densities and negative interaction predominates at high population densities (iii) Any one interaction only can occur, either positive or negative (iv) Negative interaction predominates at low population densities and positive interaction predominates at high population densities

- 1) (i) alone is correct ~~2) (i) and (ii) are correct~~
3) (i), (ii) and (iii) are correct 4) All are correct

83. Pythium sps attacks which part of plant ?

- 1) Roots 2) Seeds
3) Plant parts like beans, potatoes ~~4) All the above~~

84. Deinococci can withstand high radiation because :

- 1) Their cytoplasm prevents the radiation ~~2) They have an unique genome structure~~
3) Their cell wall is resistant to radiation 4) None of the above

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85. **Human IgM :**

- 1) Crosses the placenta
- 2) Consists of 3 subunits linked together by a J chain
- 3) Protects mucosal surfaces
- 4) Is largely restricted to the circulation

86. **Main function of fimbriae is :**

- 1) Motility
- 2) Attachment
- 3) Outer cover for bacteria
- 4) None of the above

87. **In aerobic respiration among prokaryotes, the total number of ATP molecules generated from one molecule of glucose is :**

- 1) 36
- 2) 38
- 3) 32
- 4) 34

88. Give the correct match using the codes given below:

List - I	List - II
1. Conditional mutation	(i). Gene inactivation
2. Absolute mutation	(ii). Effects of original mutation suppressed by 2 nd mutation
3. Neutral mutation	(iii). Relieved by chemical induction
4. Reverse mutation	(iv). Resulting codon is a synonym for original codon

	1	2	3	4
A.	iv	iii	i	ii
B.	ii	iv	i	iii
C.	ii	iii	i	iv
D.	iii	iv	i	ii

89. **Choose the correct statements. (i) Milk contains *Lactobacillus* (ii) Milk contains *Streptococcus* (iii) Milk contains *Mycobacterium* (iv) Milk contains *Proteus* Of these statements :**

- 1) (i) alone is correct
- 2) (i) and (ii) are correct
- 3) (ii) and (iv) are correct
- 4) All are correct

90. **Spirochetes are visualised best by using :**

- 1) Bright field microscope
- 2) Dark field microscope
- 3) Phase contrast microscope
- 4) Electron microscope

91. **The blue green algae *Oscillatoria limnetica* during day time under aerobic conditions use H₂O as an electron donor and release oxygen as other algae and under anaerobic conditions use H₂S as an electron and deposit sulfur like photosynthetic bacteria. This is an example for :**

- 1) Structural adaptation
- 2) Physiological adaptation
- 3) Both the above
- 4) None of the above

92. **Types of insecticidal toxins produced by *Bacillus thuringiensis* strains includes : (i) α type (ii) β type (iii) γ type (iv) δ type**

- 1) (i) alone is correct
- 2) (i) and (ii) are correct
- 3) (i), (ii) and (iii) are correct
- 4) All are correct

93. **Example of Biofertilizer is :**

- 1) Rhizospora
- 2) Rhizobium
- 3) Rhizosolenia
- 4) Acinetobacter

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94. For any given set of observations, possibilities are :

- 1) Arithmetic Mean \geq Geometric mean 2) Geometric Mean \geq Harmonic mean
3) Arithmetic mean \geq Harmonic mean 4) All the above are correct

95. Which of the following can be used as a vector for cloning?

- 1) Plasmid 2) Phage
3) Animal viruses 4) All the above

96. Which of the following pair is correct? (i) Sandwich ELISA - Detection of antigen (ii) Indirect ELISA - Detection of antigen or antibody (iii) Competitive ELISA - Quantification of antigen or antibody

- 1) (i) alone is correct 2) (i) and (ii) are correct
3) (ii) and (iii) are correct 4) All the above are correct

97. Plant fibres contain :

- 1) Approximately 60% of cellulose 2) Approximately 60% of lignin
3) Approximately 60% of protein 4) Approximately 60% of sugars

98. Photosynthesis done by cyanobacterium is known as :

- 1) Anoxygenic photosynthesis 2) Oxygenic photo synthesis
3) Hydrogenic photosynthesis 4) None of the above

99. A diffused and unorganized material that is easily washed off, found outside the cell wall is called -

- 1) Spore 2) Capsule
3) Slime layer 4) None of the above

100. Consider the following events during interaction between diverse microbial populations: (i) Neutralism - Production of spores, cysts and similar fruiting bodies (ii) Commensalism - Production of growth factors (iii) Predation - Engulfment of prey (iv) Ammensalism - Production of antibiotics

- 1) (i) alone is correct 2) (i) and (ii) are correct
3) (i), (ii) and (iii) are correct 4) All are correct

101. Gerhard Domask discovered :

- 1) Sulfonamides 2) Quinine
3) Penicillin 4) Antivirals

102. Photooxidative effect :

- 1) Toxicity of O_2 for living organisms 2) acts in presence of photosensitizers enhanced if cells exposed to light in presence of air
3) Light converts photosensitizer to highly reactive form 4) All of the above

103. Immunoglobulin light chains :

- 1) are joined to heavy chains by peptide bonds 2) are not found in every major immunoglobulin class
3) All have the same amino acid composition 4) Are present in the Fabfragment of IgG

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104. Match with correct causative agent of Downy Mildew and select from choices given below :

List - I	List - II
1. In onion	(i). <i>Peronosclerospora maydis</i>
2. In lettuce	(ii). <i>Pseudoperonospora cubensis</i>
3. In cucurbits	(iii). <i>Bremia Lactucae</i>
4. In maize	(iv). <i>Peronospora destructor</i>

	1	2	3	4
A.	ii	iii	iv	i
B.	iv	iii	ii	i
C.	iii	iv	i	ii
D.	ii	i	iv	iii

105. Total Hardness (as CaCO₃) in ISI specification for drinking water :

- 1) 10 g/l
~~2) 300 mg/l~~
 3) 100 mg/l
 4) 30 mg/l

106. Which of the following is example(s) for nitrification inhibitors? (i) Isobutylidene diurea (ii) Crotonilidene diurea (iii) 2-amino-4-chloro-6-methyl pyrimidine (iv) 2-chloro-6-trichloromethyl pyrimidine

- 1) (i) alone is correct
~~2) (i) and (ii) are correct~~
 3) (i), (ii) and (iii) are correct
 4) All are correct

107. The competent stage of the bacterial cell occurs during the growth stage of :

- 1) Lag phase
~~2) Log phase~~
 3) Stationary phase
 4) Decline phase

108. Icosahedron refers to the viral :

- 1) Envelope
~~2) Capsid~~
 3) Genome
 4) None of the above

109. A widely used method for gene sequencing :

- ~~1) Sanger's chain termination~~
 2) Carbon and Clarke
 3) Wu and Taylor
 4) Maxam and Gilbert

110. The separation of components in density gradient centrifugation is based on :

- ~~1) Buoyancy of the particles~~
 2) Sedimentation rate of the particles
 3) Size of the particles
 4) Viscosity of the fluid

111. Humus is a _____.

- 1) Fully cellulosic component
 2) Fully Lignin compounds
 3) Hemicellulosic compounds
~~4) Ligno-protein compounds~~

112. Which of the following is an Osmophilic Bacterium?

- 1) *Lactobacillus*
 2) *Staphylococcus*
 3) *Leuconostoc*
~~4) All the above~~

113. The factors affecting anti-microbial activity are :

- 1) pH of medium
 2) Size of inoculation
 3) Length of incubation
~~4) All of the above~~

114. Which of the following processes do not generate ATP?

- 1) Photophosphorylation
~~2) Calvin-Benson cycle~~
 3) Oxidative phosphorylation
 4) Substrate-level phosphorylation

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115. Assertion (A) : Standard deviation is extremely useful in judging the representation mass of the mean Reason (R) : A small standard deviation means high degree of uniformity of the observations as well as homogeneity of a distribution. On the other hand, a large standard deviation means just opposite.

- 1) Both (A) and (R) are true and (R) is the correct explanation of (A) 2) Both (A) and (R) are true but (R) is not the correct explanation of (A)
 3) (A) is true but (R) is false 4) (A) is false but (R) is true

116. Select the correct match.

List - I	List - II
1. Partial bunt	(i). <i>Urocystis capulae</i>
2. Common bunt	(ii). <i>Tilletia indica</i>
3. Dwarf bunt	(iii). <i>T. controversa</i>
4. Onion smut	(iv). <i>T. tritici</i>

	1	2	3	4
A.	ii	iv	iii	i
B.	iii	ii	iv	i
C.	iv	i	iii	ii
D.	iv	iii	ii	i

117. These masses of molds have no cell walls.

- 1) Plasmodial slime molds 2) Cellular slime molds
 3) Pseudo plasmodial molds 4) None of the above

118. Plasmids can offer the bacteria :

- 1) Drug resistance 2) New metabolic abilities
 3) Pathogenicity 4) All of the above

119. The naturally occurring mutation is called :

- 1) Generalized mutation 2) Specialized mutation
 3) Spontaneous mutation 4) Point mutation

120. Lenses for correcting aberration was developed by :

- 1) Ernst Abbe 2) Robert Koch
 3) L. Joblot 4) E. Delong

121. The fixation of complement by an antigen-antibody reaction can lead to :

- 1) Formation of a factor chemotactic for mononuclear cells 2) Enhanced phagocytosis
 3) Activation of T cells 4) Increased synthesis of antibody

122. The photographic film that is used to detect the radioactivity is coated with :

- 1) Silver Halide 2) Silver Nitrates
 3) Ammonium halide 4) Anhydrous urea

123. Chemical analysis of nucleoid reveals that it contains

- 1) DNA only 2) DNA and RNA only
 3) DNA, RNA and protein 4) None of the above

124. The mutation in which the purine is replaced by purine is called -

- 1) Transition 2) Transversion
 3) Deletion 4) Duplication

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125. The abundant algae growing in lake are :

- 1) Anabena
- 2) Microcystis
- 3) Nostoc
- 4) Gracillaria

126. What is the cause of fatality in Tetanus?

- 1) The rapid spread of organism in patient body
- 2) The extensive inflammation due to the disease
- 3) Attack of CNS and peripheral nerves by neurotoxin
- 4) By all the above

127. Planktons are algae that are found :

- 1) Living in the interphase of top and bottom
- 2) Living in the bottom
- 3) Suspended in the habitat
- 4) None of the above

128. Who first introduced pasteurization technique?

- 1) Franz von Soxhlet
- 2) Louis Pasteur
- 3) Sir Alexander Fleming
- 4) John Partridge

129. Choose the correct statement.

- 1) Area of the frequency curve is equal to half that of a histogram
- 2) Area of the frequency curve is equal to double that of a histogram
- 3) Area of the frequency curve is equal to that of a histogram
- 4) Area of the frequency curve is not related to the area of a histogram

130. Regarding Humulin, which is not true?

- 1) Danger of hyperinsulinemia
- 2) Fast dissociation to form biologically active molecule
- 3) Therapeutic insulin as a hexamer
- 4) Recombinant insulin that replaced allergic animal insulin

131. Assertion (A) : Lichens are considered as bio-indicators of air pollution Reason (R) : The SO₂ in atmosphere inhibits phycobiont by bleaching chlorophyll, leading to overgrowth of mycobiont and elimination of mutualistic relationship.

- 1) Both (A) and (R) are true and (R) is the correct explanation of (A)
- 2) Both (A) and (R) are true but (R) is not the correct explanation of (A)
- 3) (A) is true but (R) is false
- 4) (A) is false but (R) is true

132. Towards the end of the decomposition process, C : N ratio always comes to lie at :

- 1) 1 : 10
- 2) 10 : 1
- 3) 100 : 1
- 4) 1 : 100

133. Bacterial conjugation was described by :

- 1) Lederberg and Tatum
- 2) Griffith
- 3) Paul Ehrlich
- 4) Waksman

134. All the following are B.lactamase inhibitors except :

- 1) Piperacillin
- 2) Clavulanic acid
- 3) Sulbactam
- 4) Tazobactam

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135. In anaerobic respiration,

- 1) Molecular oxygen serves as final electron acceptor of electron transport chain
- 2) Inorganic compound other than molecular oxygen serves as final electron receptor
- 3) Organic metabolic intermediate serves as final electron acceptor
- 4) Organic and inorganic compound serve as final electron acceptor

136. The rotor used for continuous centrifugation is :

- 1) Rate zonal rotor
- 2) Fixed angle rotor
- 3) Swinging bucket rotor
- 4) Elutriator rotor

137. Gas chromatography is called so because -

- 1) Gas is used as mobile phase
- 2) Gas is used as stationary phase
- 3) Liquid is used as mobile phase
- 4) Liquid is used as stationary phase.

138. Which one of the following is correctly matched?

- 1) Natural fibres can be microbially converted into nitrogenous components
- 2) Natural fibres can be microbially converted into inorganic fertilizer
- 3) Natural fibres can be microbially converted into organic matter
- 4) Natural fibres can be microbially converted into ammonium

139. Purple and green bacteria do photosynthesis by :

- 1) Anoxygenic photosynthesis
- 2) Oxygenic photosynthesis
- 3) Anaerogenic photosynthesis
- 4) None of the above

140. The gene used to produce antibody to inactivate gp120 glycoprotein :

- 1) F105
- 2) TN07
- 3) B108
- 4) C306

141. The milk is contaminating mainly due to :

- 1) Dairy utensils
- 2) Milking machines
- 3) Improper clean of udder
- 4) All the above

142. The gene that is often referred to as suicide gene is the gene for the enzyme :

- 1) Thymidine kinase
- 2) Glucokinase
- 3) Phosphokinase
- 4) Lyase

143. Sewage waste water without suspended solid is known as :

- 1) Sillage
- 2) Backage
- 3) Sullage
- 4) None of the above

144. The mutation in which the purine is replaced by pyrimidine is called :

- 1) Transition
- 2) Transversion
- 3) Deletion
- 4) Duplication

145. Degree of freedom is related to the number of classes operating in a test and is represented by a simple formula:

- 1) $df = n$
- 2) $df > n$
- 3) $df = n-1$
- 4) $df = n+1$

146. Lichens are symbiotic associations between :

- 1) Fungi and algae
- 2) Algae and bacteria
- 3) Bacteria and virus
- 4) Virus and fungi

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147. At which site the antigen combines with the antibody?

- 1) Hapten
- 2) Epitope
- 3) Idiotype
- 4) Parotope

148. These structures help the bacterial buoyancy.

- 1) Carboxysomes
- 2) Metachromatic granules
- 3) Gas vacuoles
- 4) None of the above

149. Catabolic repression :

- 1) Decreased synthesis of certain enzymes by a cell when grown on glucose or other energy source
- 2) Increased synthesis of enzymes when grown on glucose or other energy source
- 3) Breakdown of glucose
- 4) Breakdown of pyruvate

150. Which is suitable and eco-friendly method to eliminate natural fibres?

- 1) Composting
- 2) Burrowing
- 3) Burning
- 4) All the above

151. Bacteriophages were discovered by :

- 1) Schaudian & Hoffman
- 2) Watson & Gick
- 3) D'Herelle & Twort
- 4) Schwann & Schleiden

152. Barrier filters are used in :

- 1) Light microscope
- 2) Dark field microscope
- 3) Fluorescent microscope
- 4) Phase contrast microscope

153. Viroid refers to :

- 1) DNA virus
- 2) RNA genome that lacks any other structure
- 3) Infectious proteins
- 4) None of the above

154. The presence of lactoferrin in milk is :

- 1) Enhancing microbial growth
- 2) Antimicrobial constituent
- 3) Helps to convert sweet curdling
- 4) All the above

155. N₂ fixation is controlled by : (i) Nod genes (ii) Nif genes (iii) Nodulins (iv) Hup genes

- 1) (i) alone is correct
- 2) (i) and (ii) are correct
- 3) (i), (ii) and (iii) are correct
- 4) All are correct

156. Which of the following is mutagen? (i) Nitrosoguanidin (ii) Acridine Orange (iii) Nitrous acid (iv) 5- Bromo uracil

- 1) (i) alone is correct
- 2) (i) and (ii) are correct
- 3) (iii) and (iv) are correct
- 4) All are correct

157. Cytotoxic T cells generally recognize antigen in association with :

- 1) Class II MHC determinants
- 2) Class I MHC determinants
- 3) Class III MHC determinants
- 4) HLA-DR determinants

158. Bacterial mesosomes are :

- 1) Invagination of plasma membrane
- 2) Structure found in the nucleus
- 3) Ribosomes
- 4) None of the above

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159. **Diplococci appears in pairs because :**

- 1) After cell division, they separate and reunite
- 2) Non dividing cells appear in pair
- 3) The daughter cells do not separate
- 4) None of the above

160. **TLC stands for :**

- 1) Thick layer chromatography
- 2) Thin layer chromatography
- 3) Thick liquid chromatography
- 4) Thin liquid chromatography

161. **Consider the following statements. Assertion (A) : Novel schemes are devised to isolate cDNAs of α , β and γ interferons Reason (R) : There is scarcity of both mRNAs and interferon proteins. Choose your answer from the coding schemes given**

- 1) Both statements are false
- 2) Both statements are true and (R) is correct explanation of (A)
- 3) Both statements are true but (R) is not a correct explanation of (A)
- 4) Statement 1 is true but statement 2 is wrong

162. **The T cell antigen receptor :**

- 1) recognizes epitopes on linear peptides associated with MHC determinants
- 2) Has Ig light chains
- 3) Is made up of a heavy chain and B2 microglobulin
- 4) Recognizes conformational epitopes on the native antigen

163. **Consider the following statements : (i) r represents sample correlation (ii) ρ represents population correlation (iii) δ represents coefficient of correlation (iv) R represents complete correlation**

- 1) (i) alone is correct
- 2) (i) and (ii) are correct
- 3) (i), (ii) and (iii) are correct
- 4) All are correct

164. **Picoplankton size ranges from :**

- 1) 0.1 to 2.0 μ m
- 2) 0.2 to 2.0 μ m
- 3) 0.5 to 5.0 μ m
- 4) 0.7 to 4.0 μ m

165. **Major biotic components of an ecosystem include : (i) Autotrophic producers (ii) Heterotrophic consumers (iii) Autotrophic consumers (iv) Heterotrophic producers**

- 1) (i) alone is correct
- 2) (i) and (ii) are correct
- 3) (i), (ii) and (iii) are correct
- 4) All are correct

166. **Rhizosphere effect refers to : (i) Direct influence of plant roots on microbes within rhizosphere (ii) Direct influence of microbes within rhizosphere on plant roots (iii) Direct influence of plant roots on rhizospheric soil (iv) Direct influence of rhizosphere soil on plant roots**

- 1) (i) alone is correct
- 2) (i) and (ii) are correct
- 3) (i), (ii) and (iii) are correct
- 4) All are correct

167. **A diagnostic test for typhoid**

- 1) WIDAL
- 2) CPR
- 3) RA
- 4) VDRL

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168. Leifson method is used to stain :

- 1) Nuclear material
- 2) Capsule
- 3) Cell wall
- 4) Flagella

169. Consider the following statements. (i) The observation collected for chi square test should be on random basis of sampling (ii) Each of the observations making up the sample for chi square test should be dependent on each other (iii) Chi square test is used not only for drawing inferences by testing hypothesis, but can also be used for estimation of parameter or any other value (iv) The total number of observations used in chi square test need not be large (can be less than 50)

- 1) (i) alone is correct
- 2) (i) and (ii) are correct
- 3) (i), (ii) and (iii) are correct
- 4) All are correct

170. *Rhizobium* is a :

- 1) Gram-negative bacilli
- 2) Gram-negative cocci
- 3) Gram-positive bacilli
- 4) Gram-positive cocci

171. Which one of the following is correctly matched?

- 1) Lactobacillus - Red pigmentation
- 2) Streptococcus - Curd formation
- 3) Penicilium - Alkaline production
- 4) Alcaligenes - Gas production

172. Mutalistic organisms show : (i) A highly synergistic interaction (ii) Highly specific interaction (iii) An obligatory relationship (iv) Loss of individuality and become a single organism

- 1) (i) alone is correct
- 2) (i) and (ii) are correct
- 3) (i), (ii) and (iii) are correct
- 4) All are correct

173. Aflatoxin is produced by -

- 1) *Asperigillus flarus*
- 2) *Asperigillus niger*
- 3) *Asperigillus fumigatus*
- 4) *Fusarium sp*

174. In a broad sense biomass conversion involves :

- 1) One step
- 2) 2 steps
- 3) 3 steps
- 4) 4 steps

175. Consider the following statements : Assertion (A) Many of the state owned cars in Brazil are redesigned to run on alcohol instead of gasoline Reason (R) : Brazil perhaps is the only country where fuel alcohol is used on a large scale. Now select your answer according to the coding scheme given below.

- 1) Both (A) and (R) are false
- 2) (A) is true but (R) is false
- 3) Both (A) and (R) are true but (R) is not the correct explanation of (A)
- 4) Both (A) and (R) are true but (R) is the correct explanation of (A)

176. Appertization is the process of :

- 1) Packing
- 2) Canning
- 3) Freezing
- 4) Cooling

177. Ethanol can be generated from residues having a high content of :

- 1) Lipids
- 2) Sugars
- 3) Proteins
- 4) Hydrocarbons

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178. Which of the following is not correctly matched?

- 1) Direct combustion - Biomass directly burnt for cooking
- 2) Liquefaction - Biomass react with CO_2 and water at high pressure and temperature in the presence of catalyst to produce oil.
- 3) Pyrolysis - Biomass is subjected for destructive distillation in an oxygen deficient atmosphere at high temperature
- 4) Gasification - Thermal degradation of biomass under anaerobic condition to produce gas

179. Sonti is -

- 1) Barley beer
- 2) Soya beer
- 3) Rice beer
- 4) Sugarcane beer

180. Consider the following statements : Assertion (A) Ethanol can be better produced from molasses and corn Reason (R) : The amount of starch is rich in substrates like molasses and corn Now select your answer according to the coding scheme given below.

- 1) Both (A) and (R) are true and (R) is the correct explanation of (A)
- 2) Both (A) and (R) are true but (R) is not the correct explanation of (A)
- 3) Both (A) and (R) are false
- 4) (A) is true but (R) is false

181. Methanogens are :

- 1) Strict aerobes
- 2) Facultative anaerobes
- 3) Obligate anaerobes
- 4) Microaerophiles

182. Amoebic meningioencephalitis is caused by :

- 1) Naegleria
- 2) Acanthamoeba
- 3) By both (A) and (B)
- 4) By neither (A) nor (B)

183. Consider the following statements : (i) Bioconversion involves the conversion of organic materials into energy (ii) Bioconversion involves the production of biofertilizers (iii) Bioconversion involves the production of food (iv) Bioconversion involves the production of chemicals Of these statements :

- 1) (i) alone is correct
- 2) (i) and (ii) are correct
- 3) (i), (ii) and (iii) are correct
- 4) All are correct

184. pH of fruit juice is :

- 1) 3 - 5
- 2) 2 - 3
- 3) 6 - 7
- 4) 8 - 9

185. *Aspergillus niger* is used in the commercial production of enzymes, especially : (i) α -amylase (ii) Pectinase (iii) Protease (iv) Cellulose

- 1) (i) alone is correct
- 2) (i) and (ii) are correct
- 3) (i), (ii) and (iii) are correct
- 4) All are correct

186. Sequence in correct order:

- 1) Strain development, 1° screening, 2° screening, Inoculum preparation
- 2) 1° screening, 2° screening, Strain development, Inoculum preparation
- 3) Inoculum preparation, Strain development, 1° screening, 2° screening
- 4) 1° screening, 2° screening, Inoculum preparation, Strain development

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187. Neurotoxic reactions and partial hearing loss caused due to prolonged streptomycin treatment in man can be overcome by :

- 1) Only stopping the streptomycin treatment
- 2) Stopping the treatment as well as chemical reduction of streptomycin to dihydrostreptomycin
- 3) Suppressing the symptoms by an alternative drug
- 4) Allowing it as such for natural recovery

188. Commercially important fermentations include : (i) Those that produce microbial cells (or biomass) as the product (ii) Those that produce microbial enzymes (iii) Those that produce microbial metabolites (iv) Those that produce recombinant products

- 1) (i) alone is correct
- 2) (i) and (ii) are correct
- 3) (i), (ii) and (iii) are correct
- 4) All are correct

189. Industrial Vitamin B₁₂ production is a :

- 1) Strictly anaerobic fermentation process
- 2) Strictly aerobic fermentation process
- 3) Anaerobic fermentation cycle followed by aerobic fermentation cycle
- 4) Aerobic fermentation cycle followed by anaerobic fermentation cycle

190. Industrial sterilization includes : (i) Sterilization of bioreactor (ii) Sterilization of production media (iii) Sterilization feed (iv) Sterilization of air

- 1) (i) alone is correct
- 2) (i) and (ii) are correct
- 3) (i), (ii) and (iii) are correct
- 4) All are correct

191. The chemical used for surface sterilization of plant microbes when isolating phyllosphere microbes :

- 1) Calcium chloride
- 2) Sodium Hypochloride
- 3) Poly ethylene glycol
- 4) Ammonium Sulphate

192. As soon as the Rhizobacteria are released from the infection thread into host cell is enclosed by a plant-derived membrane to form a immediate structure called :

- 1) Nod structure
- 2) Bacteroid
- 3) Symbiosome
- 4) Root vesicles

193. The compound which can inhibit gram and positive bacteria in Rhizosphere sample and may be autoclaved with medium -

- 1) Rifampin
- 2) Crystal violet
- 3) Rose Bengal
- 4) Tetracycline

194. The region where Anabaena Cycadae is present in the Coralloid roots of Cycas plant :

- 1) Epidermis
- 2) Endodermis
- 3) Vascular region
- 4) Cortex

195. The plant root surface and the surround soil in which microbes are influenced by root processes is called :

- 1) Spermosphere habitats
- 2) Rhizosphere habitats
- 3) Phyllosphere habitats
- 4) Rhizoplane habitats

196.

Give the correct match using the codes given below:

List - I	List - II
a. Ectomycorrhiza	1. Rhizoctonia sp
b. Orchid mycorrhiza	2. Pezizella sp
c. Vesicular Arbuscular mycorrhiza	3. Pisolithus sp
d. Ericoid mycorrhiza	4. Glomus sp

	a	b	c	d
A.	1	3	2	4
B.	2	3	4	1
C.	3	1	4	2
D.	4	3	1	2

197. The amount of adhering soil on roots is approximately ranging from :

- 1) 0 to 800 mg/cm of roof
 2) 0 to 1000 mg/cm of roof
~~3) 0 to 1200 mg/cm of roof~~
 4) 0 to 1600 mg/cm of roof

198. The purpose of adding Rose Bengal in media used for culturing Rhizosphere microbes is :

- 1) Aids detection of slower-growing fungi
 2) Aids detection of fast-growing fungi
~~3) Aids detection of slow-growing actinomycetes~~
 4) Aids detection of fast-growing actinomycetes

199. What is the concentration of Nystatin used in culture of Phyllosphere microbes?

- 1) 10 µg/ml
 2) 25 µg/ml
~~3) 50 µg/ml~~
 4) 100 µg/ml

200. The temperature of molden agar is added to the petri dishes contain aliquots in pour plate method is :

- 1) 28°C
 2) 37°C
~~3) 40°C~~
 4) 50°C