

14P/292/30

(To be filled up by the candidate by blue/black ball-point pen)

Roll No.

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Roll No. (Write the digits in words)

Serial No. of OMR Answer Sheet

Day and Date (Signature of Invigilator)

INSTRUCTIONS TO CANDIDATES

(Use only blue/black ball-point pen in the space above and on both sides of the Answer Sheet)

1. Within 10 minutes of the issue of the Question Booklet, check the Question Booklet to ensure that it contains all the pages in correct sequence and that no page/question is missing. In case of faulty Question Booklet bring it to the notice of the Superintendent/Invigilators immediately to obtain a fresh Question Booklet.
2. Do not bring any loose paper, written or blank, inside the Examination Hall *except the Admit Card without its envelope*.
3. A separate Answer Sheet is given. It should not be folded or mutilated. A second Answer Sheet shall not be provided. Only the Answer Sheet will be evaluated.
4. Write your Roll Number and Serial Number of the Answer Sheet by pen in the space provided above.
5. On the front page of the Answer Sheet, write by pen your Roll Number in the space provided at the top and by darkening the circles at the bottom. Also, wherever applicable, write the Question Booklet Number and the Set Number in appropriate places.
6. No overwriting is allowed in the entries of Roll No., Question Booklet no. and Set no. (if any) on OMR sheet and Roll No. and OMR sheet no. on the Question Booklet.
7. Any change in the aforesaid entries is to be verified by the invigilator, otherwise it will be taken as unfair means.
8. Each question in this Booklet is followed by four alternative answers. For each question, you are to record the correct option on the Answer Sheet by darkening the appropriate circle in the corresponding row of the Answer Sheet, by pen as mentioned in the guidelines given on the first page of the Answer Sheet.
9. For each question, darken only one circle on the Answer Sheet. If you darken more than one circle or darken a circle partially, the answer will be treated as incorrect.
10. Note that the answer once filled in ink cannot be changed. If you do not wish to attempt a question, leave all the circles in the corresponding row blank (such question will be awarded zero marks).
11. For rough work, use the inner back page of the title cover and the blank page at the end of this Booklet.
12. Deposit only OMR Answer Sheet at the end of the Test.
13. You are not permitted to leave the Examination Hall until the end of the Test.
14. If a candidate attempts to use any form of unfair means, he/she shall be liable for punishment as the University may determine and impose on him/her.

Total No. of Printed Pages : 32

[उपर्युक्त निर्देश हिन्दी में भी दिए गए हैं।]

14P/292/30

ROUGH WORK
रफ़ कार्य

14P/292/30

No. of Questions : 150

Time : $2\frac{1}{2}$ Hours

Full Marks : 450

Note : (1) Attempt as many questions as you can. Each question carries **3 (Three)** marks. **One mark will be deducted for each incorrect answer. Zero** mark will be awarded for each unattempted question.

(2) If more than one alternative answers seem to be approximate to the correct answer, choose the closest one.

01. Biochemical oxygen demand (BOD) of the medium depends on

- (1) Amount of micronutrients present in the medium
- (2) Amount of microbial load present in the medium
- (3) Amount of organic matter present in the medium
- (4) Amount of oxygen dissolved in the medium

02. In transgenic B.t. cotton, the product of incorporated bacterial gene is

- | | |
|--------------------|---------------------|
| (1) Theta exotoxin | (2) Beta exotoxin |
| (3) Delta exotoxin | (4) Delta endotoxin |

03. Which of the following statement about fungi is **false**

- (1) They are all heterotrophs
- (2) They contain membrane bound nucleus
- (3) They require organic molecules for energy source
- (4) They fix atmospheric nitrogen

- 04.** In 'Aaquaguard' used for purification of water, the microbes are killed under ultraviolet radiations due to:
- (1) Dimerization of nitrogen bases in the DNA of microbes
 - (2) Breakage of peptide bonds in the microbial proteins
 - (3) Generation of free radicals in the water
 - (4) Destruction of organic matter in water.
- 05.** Mushroom is a:
- | | |
|------------|------------|
| (1) Lichen | (2) Plant |
| (3) Alga | (4) Fungus |
- 06.** 'GMO' is the term used to refer:
- (1) Gene map of organism
 - (2) Gene manipulation and optimization
 - (3) Genetically modified organism
 - (4) Genetic marker of organism
- 07.** Natural microflora is used in the preparation of:
- | | |
|--|------------|
| (1) <input checked="" type="checkbox"/> Curd | (2) Tempeh |
| (3) <input checked="" type="checkbox"/> Idli ✓ | (4) Beer |
- 08.** An example of primary producer organism is:
- | | |
|------------------------|------------------------|
| (1) <i>Amoeba</i> | (2) <i>Plasmodium</i> |
| (3) <i>Escherichia</i> | (4) <i>Spirulina</i> . |
- 09.** In a continuous culture of bacterium, the organism is maintained in:
- | | |
|----------------------|----------------------|
| (1) Lag phase | (2) <u>Log phase</u> |
| (3) Stationary phase | (4) Decline phase |

10. The total carbon content of the medium in which aerobic bacterium is growing continuously
- (1) Increases
 - (2) Decreases
 - (3) Remains constant
 - (4) First increases and then decreases
11. Among waters from different sources, maximum BOD is shown by
- | | |
|----------------------|--------------------|
| (1) Municipal sewage | (2) Drinking water |
| (3) Distilled water | (4) River water |
12. Which of the following will increase the dissolved oxygen content of the fermentation medium by purging air through sparger
- (1) Increased air flow rate
 - (2) Reduced size of the air bubbles
 - (3) Increased revolutions of the impellor
 - (4) All the above
13. The relationship between growth rate and generation time of a bacterium is
- | | |
|---------------|------------------|
| (1) Inverse | (2) Direct |
| (3) Unrelated | (4) Proportional |
14. When *Escherichia coli* is inoculated in the medium containing both glucose and lactose, which of the following utilization pattern will be observed?
- (1) Glucose will be utilized first and lactose thereafter
 - (2) Lactose will be utilized first and glucose thereafter
 - (3) Both will be simultaneously utilized
 - (4) The one having higher concentration will be utilized first.

15. Which among the following media will actually favor the growth of certain organisms while suppressing the growth of others?
- (1) Differential medium (2) Synthetic medium
(3) Natural medium (4) Selective medium
16. Which of the following bacteria shows green metallic sheen on an eosin-methylene blue agar plate?
- (1) Gram negative enteric (2) Gram positive enteric
(3) Gram positive (4) Gram negative
17. In which of the following medium does an observable change takes place when biochemical reaction occurs?
- (1) Differential medium ✓^K (2) Complex medium
(3) Synthetic medium (4) Selective medium ?
18. The organism used for bioassay of antibiotic is:
- (1) Sensitive to that antibiotic
(2) Resistant to that antibiotic
(3) A mutant that degrades antibiotic
(4) The one that synthesizes that antibiotic
19. Mycoparasitic fungus used for control of fungal pest is:
- (1) *Rhizoglyphus solani*
(2) *Troichoderma viride*
(3) *Aspergillus niger*
(4) *Aspergillus flavus*.
20. Sodium thioglycolate is incorporated into nutrient medium for the growth of which one of the following groups?
- (1) Aerobic bacteria (2) Anaerobic bacteria
(3) Halophilic bacteria (4) Thermophilic bacteria

21. Resistance to antibiotics in the bacteria is carried in the:

- | | |
|-------------|-----------------|
| (1) Introns | (2) Exon |
| (3) Plasmid | (4) Heteromere. |

22. The characteristic that **does not** affect the death rate of microbial population under adverse condition is:

- (1) Initial population of microbes
- (2) Exposure time to adverse condition
- (3) Susceptibility of organism to adverse condition
- (4) Severity of adverse condition.

23. In a refrigerator, the spoilage of food is prevented because:

- (1) The associated microbes are killed
- (2) The microbial activity is arrested
- (3) Food is stored at lower temperature
- (4) No light is available in the closed refrigerator.

24. Resistance to beta-lactam antibiotics in bacteria is due to the capacity to synthesize an enzyme

- | | |
|------------------------|------------------------|
| (1) Penicillinase | (2) Penicillin acylase |
| (3) Penicillin amidase | (4) Penicilloic acid. |

25. At the center of composting pit, the surviving microbial population predominantly consists of

- | | |
|-------------------|----------------|
| (1) Psychrophiles | (2) Mesophiles |
| (3) Thermophiles | (4) Halophiles |

26. During the production of semisynthetic penicillin, an enzyme required for breakdown of 6-amino-penicillanic acid moiety benzyl penicillin is:

- | | |
|--------------------------------|---------------------------|
| (1) Penicillinase ✓ | (2) Penicillin acylase ✓✓ |
| (3) Aromatase | (4) Penicillin kinase. |

27. The process that reduces the number of potential pathogens on an inanimate object until they no longer represent a disease hazard is called:

- (1) Sterilization
- (2) Disinfection
- (3) Antisepsis
- (4) Decimal reduction

28. Which of the following best describes how cells in a population die when exposed to an antimicrobial agent?

- (1) It depends on the species
- (2) It depends on the antimicrobial agent.
- (3) The cells all die at once
- (4) The cells in a population die exponentially.

29. Which of the following physical treatments causes damage to bacterial cells by production of free radicals?

- (1) Ultraviolet light
- (2) Gamma ray irradiation ✓
- (3) Microwave irradiation
- (4) Heat

30. Which of the following would be the fastest way to kill endospores?

- (1) Autoclave at 121 degrees Celcius
- (2) Tincture of soap
- (3) Hot air oven at 180 degrees Celcius
- (4) Chlorox solution

31. The time it takes to kill 90% of a population of bacteria under specific conditions is defined as

- (1) Generation time
- (2) Thermal death time
- (3) Decimal reduction time
- (4) Half life time

32. Which one of the following is a fungal sexual spore?
- (1) Basidiospore (2) Blastospore
(3) Chlamyospore (4) Conidiospore
33. The exotoxin produced by *Clostridium botulinum* is due to:
- (1) Lytic infection (2) Virulent infection
(3) Lysogenic conversion (4) Transduction
34. Infections acquired in a hospital are called as
- (1) Critical infection
(2) Fastidious infections
(3) Nosocomial infections ?
(4) Opportunistic infections ✓
35. Which of the following diseases are caused by bacteria?
- (1) Pneumonia, Tetanus and Diabetes ✗
(2) Pneumonia, Tetanus and Scurvy ✗
(3) Typhoid, Measles and Cholera ✗
(4) Typhoid, Pneumonia and Tuberculosis ✓
36. Down stream processing is best defined as:
- (1) Procedure adopted to the recovery of product from broth
(2) Conversion of laboratory procedure to an industrial process
(3) Removal of broth from fermentation vessel
(4) Flow of medium from higher to lower level.
37. Biochemical oxygen demand of the medium is directly proportional to
- (1) The number of microorganisms present in it. ?
(2) Amount of oxygen dissolved in the medium ?
(3) Amount of organic matter present in the medium ✓
(4) Amount of micronutrients present in the medium

38. In transgenic B.t. cotton, the product of incorporated bacterial gene is
- | | |
|--------------------|---------------------|
| (1) Theta-exotoxin | (2) Beta-exotoxin |
| (3) Delta-exotoxin | (4) Delta-endotoxin |
39. Mycoparasitic fungus used for the control of fungal pests on crop plants is
- | | |
|-------------------------------|-------------------------------|
| (1) <i>Rhizoctonia solani</i> | (2) <i>Trichoderma viride</i> |
| (3) <i>Aspergillus flavus</i> | (4) <i>Rhizopus niger</i> |
40. For quantitative estimation of total soil bacteria, which of the following is an appropriate method?
- (1) Serial dilution and plating
 - (2) Direct plating
 - (3) Enrichment culture plating
 - (4) Direct counting of bacteria under microscope
41. Which of the following antibiotic has a beta-lactam ring?
- | | |
|-------------------|----------------|
| (1) Cephalosporin | (2) Polymyxin |
| (3) Streptomycin | (4) Bacitracin |
42. When purged in water, which of the following will have largest surface area per unit volume of the air?
- (1) Bubbles having diameter of 1 millimeter ✓ *key*
 - (2) Bubbles having diameter of 2 millimeter
 - (3) Bubbles having diameter of 3 millimeter
 - (4) Bubbles having diameter of 4 millimeter
43. Which of the following technique gives a viable count?
- (1) Most probable number ✓
 - (2) Direct microscopic count
 - (3) Turbidometry
 - (4) Dry weight determination

44. Sodium thioglycollate is incorporated into nutrient medium for the growth of which of the following group?
- (1) Aerobic bacteria (2) Anaerobic bacteria ✓
 (3) Halophilic bacteria (4) Thermophilic bacteria
45. Lactobacilli contribute to food production by
- (1) Altering flavour
 (2) Enhancing nutrient value
 (3) Reducing contamination and retarding spoilage
 (4) All the above
46. There are three basic tests to detect coliform bacteria in water, presumptive, confirmed and completed tests. The following apply to these tests **except**
- (1) They are performed sequentially
 (2) They detect lactose fermentation by acid and gas production
 (3) They use MPN method
 (4) They determine the dry cell weight of coliforms in the sample
47. Which of the following biological preparations contain viable attenuated organisms?
- (1) B.C.G. vaccine (2) Diphtheria antitoxin
 (3) Titanus antitoxin (4) Old tuberculin
48. A causative agent of ringworm is
- (1) *Trichophyton rubrum* ✓
 (2) *Blastomyces dermatitidis*
 (3) *Candida albicans* (4) *Sporothrix schenckii*
49. Which of the following characteristic is common to both pseudomonads and *Escherichia coli*?
- (1) They both produce endospores
 (2) They are both Gram negative rods
 (3) They are both enteric bacteria
 (4) They are both strict anaerobes

50. After a virus has attached and penetrated into the host cell, no virus can be detected until the host cell is lysed. This stage of viral replication is called as

- (1) Latent period ✓
- (2) Penetration
- (3) Budding ✓
- (4) Lysis

51. Which of the following statement about fungi is *false*?

- (1) They are heterotrophs
- (2) Their cell wall is composed of chitin
- (3) They do not contain membrane bound nucleus
- (4) They are decomposers

52. Which of the following is an asexual spore?

- (1) Basidiospore
- (2) Ascospore
- (3) Zygospore
- (4) Conidia

53. Which of the following characteristic would *not* be important for an organism used in an industrial process

- (1) Fast growth rate
- (2) Genetic stability
- (3) Amenability to genetic manipulation
- (4) Must be a prokaryote

54. The production of secondary metabolites occurs at or near the onset of which of the microbial growth phase?

- (1) Lag phase
- (2) Log phase
- (3) Stationary phase
- (4) Exponential phase

55. Which of the following is **not** a primary metabolite in microorganisms?
- (1) Vitamin B12 (2) Riboflavin
(3) Antibiotics (4) Amino acids
56. Commercially vitamin B12 is produced by
- (1) *Bacillus sp.*
(2) *Propionibacterium sp.*
(3) *Rhizopus sp.*
(4) *Agrobacterium sp.*
57. The cells of bacteria can be categorized according to their arrangement. A cubical packet of eight cocci is known as
- (1) Sarcina ✓
(2) Diplococci
(3) Streptococci (4) Staphylococci
58. An ultraviolet light source is used in
- (1) Phase-contrast microscope (2) Darkfield microscope
(3) Electron microscope (4) ✓ Fluorescent microscope ✓
59. HIV, a virus causing AIDS is classified as
- (1) *Arbovirus* (2) *Retrovirus*
(3) *Togavirus* (4) *Baculovirus*
60. The proteases used in the detergents have pH optimum in a range of
- (1) 4 to 5 ✓
(2) 6 to 8
(3) 9 to 10 ✓
(4) 3 to 4

61. The characteristic that *does not* affect the rate at which a population of an organism killed is

- (1) Population size
- (2) Time of exposure to killing agent
- (3) Susceptibility of an organism
- (4) Concentration of an antimicrobial agent

62. Antigens

- (1) Are always proteins w
- (2) Always induce the formation of antibodies ✓_R
- (3) Are not involved in allergic reaction w
- (4) Are immunoglobulins w

63. The positive test for acid fast stain is shown by the bacteria causing the disease

- (1) Tuberculosis
- (2) Typhoid
- (3) Tetanus
- (4) Colitis

64. Micorrhiza represents

- (1) Parasitic association between root and fungus
- (2) Symbiotic association between root and fungus
- (3) Symbiotic association between root and bacteria
- (4) Parasitic association between root and algae

65. Chains of cells is a characteristic property of the genus

- (1) *Staphylococcus*
- (2) *Bacillus*
- (3) *Streptococcus* ✓
- (4) *Corynebacterium*.

66. Antibiotic resistance is referred to
- (1) The resistance of human body to antibiotics
 - (2) Loss of sensitivity of a pathogen to antibiotics
 - (3) Deformity produced by antibiotic treatment in human body
 - (4) Acquisition of a plasmid
67. The presence of *E. coli* in a municipal water supply indicate
- (1) Tube well as a source of water
 - (2) Water is stored before supply
 - (3) Water is fit for drinking
 - (4) Faecal contamination.
68. Which of the following conversion is undesirable in wine making?
- | | |
|-------------------------------|------------------------------|
| (1) Sucrose to ethanol | (2) Ethanol to acetic acid ✓ |
| (3) Malic acid to lactic acid | (4) Fructose to pyruvic acid |
69. A vector is a
- (1) Natural reservoir of a pathogen
 - (2) Human parasite
 - (3) Disease transmitting host
 - (4) Pathogenic organism
70. The catalytic activity of enzymes is due to
- (1) Reduction in the activation energy of the reactants
 - (2) Reduction in the potential energy of the reactants
 - (3) Increase in the free energy of the reaction
 - (4) Increase in the kinetic energy of the reactants

71. When *E. coli* is inoculated to the medium containing both glucose and lactose, which of the following utilization pattern will be observed
- (1) Both will be utilized simultaneously
 - (2) The one which is present in higher concentration will be utilized first
 - (3) Lactose will be utilized first and glucose thereafter
 - (4) Glucose will be utilized first and lactose thereafter.
72. During organic evolution, the organism first appeared on the earth are
- | | |
|-------------|-----------------------------|
| (1) Algae | (2) Fungi |
| (3) Viruses | (4) Photosynthetic bacteria |
73. Immobilized enzyme is
- (1) A purified enzyme preparation
 - (2) Enzyme linked to a water insoluble solid support
 - (3) Enzyme located on plasma membrane
 - (4) Enzyme dissolved in buffer
74. In prokaryotic cells, the enzymes involved in the oxidation of metabolites are associated with
- | | |
|------------------|------------------|
| (1) Mitochondria | (2) Nucleoid |
| (3) Mesosomes ✓ | (4) Chloroplasts |
75. In nitrogen fixation
- (1) Plant fix nitrogen into nitrate
 - (2) Plant convert nitrite into nitrate
 - (3) The enzyme nitrogenase produce ammonias from nitrogen ✓
 - (4) Bacteria are present on the roots

- 76.** Antibiotics are the chemicals which
- (1) Kill the microbes
 - (2) Arrest the growth of microbes
 - (3) Are produced by the microbes and arrest the growth or kill the microbes
 - (4) Products of anabolic reactions
- 77.** Microbial insecticide is a preparation that contains
- (1) Insects harmful to microbes
 - (2) Microbes harmful to insets
 - (3) Microbes producing diseases in plants
 - (4) Plant pathogens
- 78.** Ti plasmid is present in
- | | |
|--------------------------------|--|
| (1) <i>Escherichia coli</i> | (2) <i>Bacillus subtilis</i> |
| (3) <i>Serratia marcescens</i> | (4) <i>Agrobacterium tumefaciens</i> . |
- 79.** Km value of an enzyme represents
- (1) Substrate concentration at half maximum velocity
 - (2) Velocity at half substrate concentration
 - (3) Enzyme concentration at half maximum velocity
 - (4) Substrate concentration at maximum velocity
- 80.** The end product of carbohydrate metabolism changes under aerobic and anaerobic conditions in an organism
- | | |
|--------------------------|------------------------------|
| (1) <i>Lactobacillus</i> | (2) <i>Saccharomyces</i> ✓ K |
| (3) <i>Mycobacterium</i> | (4) <i>Clostridium</i> |
- 81.** Generation time of an organism represents
- (1) Number of generations completed in one hour X
 - (2) Time period lapsed between two successive divisions ✓ K
 - (3) Time required by a cell to divide ✓
 - (4) Time required to prepare cell for division.

82. Isozymes are a group of enzymes

- (1) Acting on a substrate producing the same product(s)
- (2) Having same pH optimum
- (3) Having same Km value
- (4) Having same turn over number

83. A strong positive catalase test is shown by

- | | |
|-----------------|-------------------------------|
| (1) Aerobes ✓ P | (2) Facultative anaerobes ✓ P |
| (3) Anaerobes | (4) Microaerophilic organisms |

84. Pasteurised milk is:

- | | |
|-------------------|-------------------------------|
| (1) Sterile milk | (2) Free from human pathogens |
| (3) Defatted milk | (4) Boiled milk |

85. Root nodules are found in:

- (1) Some leguminous plants
- (2) Some leguminous and some other plants ?
- (3) All plants
- (4) All leguminous plants but never in other plants. ✓

86. Biochemical oxygen demand (BOD) represents:

- (1) Amount of oxygen required by microorganisms to oxidize organic matter
- (2) Demand of oxygen by microbes
- (3) Amount of oxygen required by microorganisms to oxidize organic and inorganic matter
- (4) Total amount of oxygen dissolved in water.

87. Which of the following is the most suitable organism for use in testing the efficiency of steam sterilization?

- (1) *Clostridium perfringens*
- (2) *Bacillus stearothermophilus*
- (3) *Bacteroides fragilis*
- (4) *Bacillus subtilis*

88. In the process of cheese manufacture, the microorganisms are important for
- (1) Souring and ripening ✓^k
 - (2) The souring of milk
 - (3) The ripening of cheese
 - (4) Prevention of spoilage.
89. 'Superbug' is a bacterium:
- (1) Used for controlling bug pest
 - (2) Capable of using mineral oil as carbon source ✓
 - (3) Resistant to most of the antibiotics,
 - (4) Pathogenic to humans.
90. Restriction endonucleases are utilized in genetic engineering to:
- (1) Degrade DNA molecule
 - (2) Build nucleotide sequence
 - (3) Cut DNA at specific sites ✓^k
 - (4) Combine fragments of DNA into long chains
91. A cell divides every minute and takes one hour to fill a cup. How much time will it take to fill half a cup?
- | | |
|----------------|------------------|
| (1) 30 minutes | (2) 45 minutes |
| (3) 55 minutes | (4) 59 minutes ✓ |
92. Normally, the soreness of curd formed at room temperature by addition of equal amount of starter culture in milk is maximum in the month of:
- | | |
|--------------|--------------|
| (1) February | (2) May |
| (3) August | (4) November |

93. An *in vitro* technique, making large amount of any DNA sequence without the need for cloning is called the
- (1) DNA sequencing (2) Southern
(3) Poymerase chain reaction (4) DNA fingerprinting.
94. A chemical substance that is produced in highest amount in nature is
- (1) Chlorophyll (2) Lignin
(3) Cellulose (4) Pectin
95. Which of the following host defense is considered a specific defense?
- (1) Lysozyme in tears
(2) Low pH in stomach
(3) Secretion of mucus
(4) Production of antibodies by lymphocytes
96. A single bacterial cell is allowed to reproduce in liquid culture under favorable conditions. During which period will the total number of living cells be decreasing?
- (1) The beginning of lag phase
(2) The middle of log phase
(3) The middle of death phase
(4) The middle of stationary phase.
97. The death curve when microbes are exposed to adverse conditions during sterilization represents
- (1) A straight line (2) Parabolic curve
(3) Hyperbolic curve (4) Sigmoid curve
98. Which of the following is **not** a step of down stream processing:
- (1) Precipitation (2) Mutation
(3) Crystallization. (4) Filtration

99. An organism responsible for spoilage of canned food is:

- | | |
|-------------------------|--------------------------|
| (1) <i>Xanthomonas</i> | (2) <i>Pseudomonas</i> |
| (3) <i>Methanomonas</i> | (4) <i>Clostridium</i> . |

100. Chemically viruses are:

- | | |
|-------------------|---------------------|
| (1) Proteins | (2) Phospholipids |
| (3) Glycoproteins | (4) Nucleoproteins. |

101. A group of bacteria which grows in extreme environmental conditions is referred as

- (1) Chemolithotrophic bacteria
- (2) Archaeobacteria
- (3) Rickettsiae
- (4) Actinomycetes.

102. In a crowded plate technique, the criteria used for the detection of a desired colony is

- | | |
|--------------------------|-------------------|
| (1) Zone of growth ✓ | (2) Colour change |
| (3) Zone of inhibition ✓ | (4) Zone of lysis |

103. The heat sensitive components of microbial medium are sterilized by:

- | | |
|----------------|-------------------------|
| (1) Moist heat | (2) Dry heat |
| (3) Radiation | (4) Membrane filtration |

104. Nutrients from the environment are converted to cell components through the process of:

- | | |
|--------------------|---------------------|
| (1) Lyophilization | (2) Ionophorization |
| (3) Catabolism | (4) Anabolism |

105. In which of the following disease(s) does/do the pathogen thrive in anaerobic condition?

- (1) Gas gangrene (2) Tetanus
(3) Botulism (4) All the above ✓/K

106. In case of humans, lysine is an essential amino acid because:

- (1) It is present in all proteins
(2) It is highly nutritive
(3) It is not formed in the body and has to be supplied through the diet
(4) It is required for protein synthesis.

107. Which of the following is **not** a vitamin:

- (1) Folic acid (2) Ascorbic acid
(3) Succinic acid (4) Nicotinic acid.

108. A flatoxin is produced by the fungus belonging to the genera

- (1) *Penicillium* (2) *Alternaria*
(3) *Aspergillus* (4) *Rhizopus*.

109. During fermentation, sugar is broken down into

- (1) Ethanol and carbon dioxide (2) Ethanol and oxygen
(3) Oxygen and carbon dioxide (4) Ethanol and water.

110. H.E.P.A. filter is used to filter

- (1) Air (2) Water
(3) Soil (4) Milk

111. Vitamins are the chemicals which are

- (1) Soluble in fat
- (2) All amines
- (3) Required for growth and not synthesized in the body
- (4) Produced by microbes

112. Sweet and salty foods often do not require refrigeration to prevent spoilage, because they have

- (1) Low pH
- (2) High osmotic pressure
- (3) Naturally occurring antibiotics
- (4) Toxic alkaline chemicals

113. The proteases used in detergents

- (1) Acid proteases
- (2) Alkaline proteases
- (3) Neutral proteases
- (4) Serine proteases

114. A dead body can be preserved in ice because low temperature

- (1) Kills the microbes
- (2) Makes the body hard and resistant to microbial attack
- (3) Arrest the activity of associated microbes
- (4) Inhibits the movement of microbes through ice.

115. In relation to optimal growth requirements of bacterium, which group would you expect to be most likely involved in human infections?

- (1) Extreme halophiles
- (2) Acidophiles
- (3) Mesophiles
- (4) Thermophiles

116. Which of the following physical treatments causes damage to bacterial cells through the production of free radicals?

- (1) Ultraviolet light
- (2) Gamma radiations
- (3) Microwave irradiation
- (4) Moist heat

117. The largest reservoir of actinomycetes is

- (1) Milk
- (2) River water
- (3) Air
- (4) Soil

118. The amylase that breaks 1-6 glycosidic linkage in a starch molecule is

- (1) Alpha amylase *works on 1-6 glycosidic linkage*
- (2) Beta amylase *→ 1,4 linkage*
- (3) Amyloglucosidase
- (4) Pullulanase *1,4 + 1,6*

119. Tetracyclin group of antibiotics act by:

- (1) Inhibiting the synthesis of peptidoglycan
- (2) Inhibiting 50 S ribosome function
- (3) Inhibiting aminoacyl t-RNA binding to ribosome
- (4) Inhibiting m-RNA translation.

120. The organisms belonging to rickettsia are

- (1) Photosynthetic
- (2) Nitrogen fixers
- (3) Obligate intracellular parasites
- (4) Bacteriophages

121. Enzymes not subjected to regulation by induction or repression are called:

- (1) Repressor enzymes
- (2) Constitutive enzymes
- (3) Promotor enzymes
- (4) Inducible enzymes

122. During esterification, OH- ions for the formation of water comes from

- (1) Acid ✓
- (2) Alcohol ✓
- (3) ketone
- (4) Glucose.

123. A 5% solution of cane sugar (Molecular weight-342) is isotonic with 1% solution of a substance X. The molecular weight of substance X is

- (1) 171.2 (2) 68.4 (3) 34.2 (4) 136.2

124. What is the relationship between resolving power of a microscope and wavelength?

- (1) Shorter the wavelength, higher the resolving power
(2) Longer the wavelength, higher the resolving power
(3) There is no relationship
(4) It depends on the convexity of the eyepiece lens.

125. The relationship between organisms in which one species is benefited and other is not affected is referred as

- (1) Mutualism (2) Commensalism
(3) Antagonism (4) Parasitism

126. The sequence of reactions during methane production in a biogas digester is

- (1) Hydrolysis-acidolysis-methanogenesis
(2) Acidolysis-Hydrolysis-methanogenesis
(3) Acidolysis- mineralization-methanogenesis
(4) None of the above

127. Although microbes are a very good source of proteins, Single Cell protein is not popular

- (1) High nucleic acid content
(2) Slow digestibility
(3) Presence of polycyclic aromatic compounds
(4) All the above

128. The reaction $4\text{H}_2 + \text{CO}_2 \rightarrow \text{CH}_4 + 2\text{H}_2\text{O}$ $\Delta A^\circ P$
- (1) Liberates energy ✓
 - (2) Requires energy ✓
 - (3) Occures spontaneously
 - (4) None of the above

129. In Operon theory of regulation of enzyme synthesis, to prevent transcription the repressor reacts with
- (1) Operator gene ✓ ok
 - (2) Promotor gene
 - (3) Regulatory gene
 - (4) Structural gene

130. An *in vitro* technique, making large amount of any DNA sequence without the need for cloning is called the

- (1) DNA sequencing
- (2) Southern blotting
- (3) Poymerase chain reaction
- (4) DNA fingerprinting

131. Unique properties of each amino acid determined by its

- (1) Amino group
- (2) R-group
- (3) Peptide bond
- (4) Hydrogen bond

132. Which is **not** the intrinsic factor for food spoilage?

- (1) Moisture content
- (2) Nutrient availability
- (3) Temperature ✓
- (4) Physical structure ✓

133. What is the order of reagents used during Gram staining?

- (1) Crystal violet, iodine, safranin, decolorizer ✗
- (2) Crystal violet, iodine, decolorizer, safranin ✓
- (3) Safranin, crystal violet, decolorizer, iodine ✗
- (4) Decolorizer, crystal violet, iodine, safranin ✗

134. The field of microbiology concerning the monitoring and spread of diseases is

- (1) Immunology
- (2) Epidemiology ✓
- (3) Anthropology
- (4) Quarentology

135. A common inhabitant of fresh water and marine water is

- | | |
|-----------------------|------------------------|
| (1) <i>Spirogyra</i> | (2) <i>Riccia</i> |
| (3) <i>Oedogonium</i> | (4) <i>Cladosphora</i> |

136. Citrus canker is caused by

- | | |
|------------------------|------------------------|
| (1) <i>Azotobacter</i> | (2) <i>Salmonella</i> |
| (3) <i>Erwinia</i> | (4) <i>Xanthomonas</i> |

137. Aseptate hyphae are observed in

- | | |
|-------------------------|-------------------------|
| (1) <i>Cladosporium</i> | (2) <i>Rhizopus</i> |
| (3) <i>Cryptococcus</i> | (4) <i>Trichophyton</i> |

138. Lichens are the initiators of

- | | |
|--------------|----------------|
| (1) Xerosere | (2) Hydrosere |
| (3) Halosere | (4) Psammosere |

139. Microbes obtain phosphorus mainly from

- (1) Inorganic phosphate ions
- (2) Phospholipids
- (3) Nucleic acids
- (4) ATP

140. Which of the following is a fungal sexual spore?

- | | |
|-------------------|------------------|
| (1) Chlamydospore | (2) Basidiospore |
| (3) Blastospore | (4) Conidiospore |

141. The indiscriminate use of antibiotics should be avoided because

- (1) They are expensive
- (2) They sometimes cause allergic reactions
- (3) They kill useful microflora in human body
- (4) They persist in the body for long time

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142. Hydrolysis of gelatin is an indication that the organism secretes

- | | |
|---------------|--------------|
| (1) Pectinase | (2) Amylase |
| (3) Invertase | (4) Protease |

143. Blackstrap molasses is a byproduct of

- | | |
|-------------------------|-------------------------|
| (1) Beet-sugar industry | (2) Cane sugar industry |
| (3) Soybean industry | (4) Starch industry |

144. An enzyme EC I.I.I.I is a

- | | |
|--------------------|---------------|
| (1) Oxidoreductase | (2) Lyase |
| (3) Transferase | (4) Isomerase |

145. A substance that can evoke either a humoral or cell mediated immune response is termed as

- | | |
|--------------------|----------------|
| (1) An immunogen ✓ | (2) A hapten |
| (3) An epitope | (4) An antigen |

146. How many high energy bonds are present in ATP?

- | | |
|----------------|-----------------------|
| (1) One bond | (2) Two bond |
| (3) Three bond | (4) None of the above |

147. Zygomycetes differ from other fungi in having

- (1) Coenocytic hyphae
- (2) Peptidoglycan in their cell wall
- (3) No sexual spores
- (4) No asexual spores

148. Penicillin is rapidly degraded in

- | | |
|---------------------|---------------------|
| (1) Acidic medium ✓ | (2) Alkaline medium |
| (3) Neutral medium | (4) Deionized water |

149. If the mixture of enzymes amylase, cellulose, pectinase and protease is incubated at suitable conditions, the enzyme that persists at the end will be

- | | |
|---------------|---------------|
| (1) Amylase | (2) Protease |
| (3) Cellulase | (4) Pectinase |

150. An organism that use glucose as an energy source is

- (1) Organolithotrophic
- (2) Photoorganotrophic
- (3) Chemolithotrophic
- (4) Chemoorganotrophic

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ROUGH WORK
रफ़ कार्य

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ROUGH WORK
रफ़ कार्य

अभ्यर्थियों के लिए निर्देश

(इस पुस्तिका के प्रथम आवरण पृष्ठ पर तथा उत्तर-पत्र के दोनों पृष्ठों पर केवल नीली-काली बाल-प्वाइंट पेन से ही लिखें)

1. प्रश्न पुस्तिका मिलने के 10 मिनट के अन्दर ही देख ले कि प्रश्नपत्र में सभी पृष्ठ मौजूद हैं और कोई प्रश्न छूटा नहीं है। पुस्तिका दोषयुक्त पाये जाने पर इसकी सूचना तत्काल कक्ष-निरीक्षक को देकर सम्पूर्ण प्रश्नपत्र की दूसरी पुस्तिका प्राप्त कर लें।
2. परीक्षा भवन में लिफाफा रहित प्रश्न-पत्र के अतिरिक्त, लिखा या सादा कोई भी खुला कागज साथ में न लायें।
3. उत्तर-पत्र अलग से दिया गया है। इसे न तो मोड़ें और न ही विकृत करें। दूसरा उत्तर-पत्र नहीं दिया जायेगा। केवल उत्तर-पत्र का ही मूल्यांकन किया जायेगा।
4. अपना अनुक्रमांक तथा उत्तर-पत्र का क्रमांक प्रथम आवरण-पृष्ठ पर पेन से निर्धारित स्थान पर लिखें।
5. उत्तर-पत्र के प्रथम पृष्ठ पर पेन से अपना अनुक्रमांक निर्धारित स्थान पर लिखें तथा नीचे दिये वृत्तों को गाढ़ा कर दें। जहाँ-जहाँ आवश्यक हो वहाँ प्रश्न-पुस्तिका का क्रमांक तथा सेट का नम्बर उचित स्थानों पर लिखें।
6. ओ० एम० आर० पत्र पर अनुक्रमांक संख्या, प्रश्नपुस्तिका संख्या व सेट संख्या (यदि कोई हो) तथा प्रश्नपुस्तिका पर अनुक्रमांक और ओ० एम० आर० पत्र संख्या की प्रविष्टियों में उपरिलेखन की अनुमति नहीं है।
7. उपर्युक्त प्रविष्टियों में कोई भी परिवर्तन कक्ष निरीक्षक द्वारा प्रमाणित होना चाहिये अन्यथा यह एक अनुचित साधन का प्रयोग माना जायेगा।
8. प्रश्न-पुस्तिका में प्रत्येक प्रश्न के चार वैकल्पिक उत्तर दिये गये हैं। प्रत्येक प्रश्न के वैकल्पिक उत्तर के लिए आपको उत्तर-पत्र की सम्बन्धित पंक्ति के सामने दिये गये वृत्त को उत्तर-पत्र के प्रथम पृष्ठ पर दिये गये निर्देशों के अनुसार पेन से गाढ़ा करना है।
9. प्रत्येक प्रश्न के उत्तर के लिए केवल एक ही वृत्त को गाढ़ा करें। एक से अधिक वृत्तों को गाढ़ा करने पर अथवा एक वृत्त को अपूर्ण भरने पर वह उत्तर गलत माना जायेगा।
10. ध्यान दें कि एक बार स्वाही द्वारा अंकित उत्तर बदला नहीं जा सकता है। यदि आप किसी प्रश्न का उत्तर नहीं देना चाहते हैं, तो संबंधित पंक्ति के सामने दिये गये सभी वृत्तों को खाली छोड़ दें। ऐसे प्रश्नों पर शून्य अंक दिये जायेंगे।
11. रफ कार्य के लिए प्रश्न-पुस्तिका के मुखपृष्ठ के अंदर वाला पृष्ठ तथा उत्तर-पुस्तिका के अंतिम पृष्ठ का प्रयोग करें।
12. परीक्षा के उपरान्त केवल ओ एम आर उत्तर-पत्र परीक्षा भवन में जमा कर दे।
13. परीक्षा समाप्त होने से पहले परीक्षा भवन से बाहर जाने की अनुमति नहीं होगी।
14. यदि कोई अभ्यर्थी परीक्षा में अनुचित साधनों का प्रयोग करता है, तो वह विश्वविद्यालय द्वारा निर्धारित दंड का/की, भागी होगा/होगी।