Time : 1 Mins **MICROBES IN HUMAN WELFARE 1** **Marks : 800**

1. Microbes are present in
   a) soil b) thermal vents c) polluted water d) all of these.
2. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
   Assertion: Acetic acid production involves both aerobic and anaerobic processes.
   Reason: Production of alcohol from glucose is an aerobic process and production of acetic acid from alcohol is an anaerobic process
   a) If both assertion and reason are true and reason is the correct explanation of assertion
   b) If both assertion and reason are true but reason is not the correct explanation of assertion
   c) If assertion is true but reason is false. d) If both assertion and reason are false.
3. Which of these following methods is the most suitable for disposal of nuclear waste?
   a) Bury the waste under Antarctic ice-cover.
   b) Dump the waste within rocks under deep ocean.
   c) Bury the waste within rocks deep below the Earth's surface.
   d) Shoot the waste into space.
4. Which of the following statements regarding antibiotics is not correct?
   (i) Antibiotics are the attenuated microorganisms which in small concentration can kill or retard the growth of other harmful microorganisms
   (ii) Penicillin was the first antibiotic discovered by Alexander Fleming (1928) while working on bacterium Staphylococcus aureus.
   (iii) The full potential of penicillin as an effective antibiotic was established by Ernest Chain and Howard Florey.
   (iv) Fleming, Chain and Florey were awarded the Nobel Prize in 1945.
   a) (i) only b) (iii) only c) (ii) and (iv) d) (i), (iii) and (iv)
5. Study the following statements and select the correct ones.
   (i) Methanogens are archaebacteria which produce methane in marshy areas
   (ii) Nostoc is a filamentous blue green alga which fixes atmospheric nitrogen
   (iii) Many members of the genus Glomus form my corrhiza
   a) (i) and (ii) b) (i) and (iii) c) (ii) and (iii) d) (i), (ii) and (iii)
6. Which of the following is a non-symbiotic biofertiliser?
   a) VAM b) Azotobacter c) Anabaena d) Rhizobium
7. Wine and beer are produced directly by fermentation whereas brandy and whisky require both fermentation and distillation. This is because:

a) fermentation is inhibited at an alcohol level of 10-18% b) distillation prolongs storage
c) distillation improves quality d) distillation purifies the beverage

8. Which one of the following microorganisms forms symbiotic association with plants and helps them in their nutrition?
   a) Glomus b) Azotobacter c) Klebsiella d) Azospirillum
9. Organic farming includes
   a) use of fertilisers and pesticides of biological origin b) IPM (Integrated Pest Management)
   c) locally developed pest resistant varieties d) all of these.
10. Baculoviruses (Nucleopolyhedrovirus) do not show
    a) host specificity b) narrow spectrum applications c) effects on non-target pathogens
    d) utility in IPM programme.
11. The common nitrogen fixer in paddy fields is _____.
    a) Rhizobium b) Azospirillum c) Oscillatoria d) Frankia
12. A good producer of citric acid is _____.
    a) Pseudomonas b) Clostridium c) Saccharomyces d) Aspergillus
13. Which one of the following is an example of carrying out biological control of pests/ diseases using microbes?
    a) Trichodenna sp. against certain plant pathogens
    b) Nucleopolyhedrovirus against white rust in Brassica
    c) Bt - cotton to increase cotton yield d) Ladybird beetle against aphids in mustard
14. Which of the following is not used as abiopesticide?
    a) Xanthomonas campestris b) Bacillus thuringiensis c) Trichoderma harzianum
    d) Nucleopolyhedrovirus
15. Biochemical oxygen demand (BOD) in a river water
    a) has no relationship with concentration of oxygen in the water
    b) gives a measure of Salmonella in the water
    c) increases when sewage gets mixed with river water
    d) remains unchanged when algal bloom occurs.
16. Which of the following is non-syrnbiotic biofertiliser?
    a) VAM b) Azotobacter c) Anabaena d) Rhizobium
17. Which one of the following combinations of organisms are responsible for the formation and flavour of yoghurt?
    a) Lactobacillus bulgaricus and Streptococcus thermophilus
    b) Rhizobium meliloti and Azotobacter c) Bacillus subtilis and Escherichia coli
    d) Bacillus megathermus and Xanthomonas species
18. Conversion of milk to curd improves its nutritional value by increasing the amount of :
    a) Vitamin B_{12} b) Vitamin A c) Vitamin D d) Vitamin E
19. For retting of jute, the fermenting microbe used is _____.
    a) Methophilic bacteria b) Butyric acid bacteria c) Helicobacter pylori
    d) Streptococcus lactin

20. Match column I with column II and select the correct answer from the given codes

Column I	**Column II**
A. Mycorrhizae	(i) Azadirachtin
B. Bacillus thuringiensis	(ii) Phosphorus nutrition
C. Root nodules	(iii) Leghaemoglobin
D. Biopesticid	(iv) Bioinsecticide

a) A-(iii), B-(i), C-(ii), D-(iv) b) A-(ii), B-(iii), C-(iv), D-(i) c) A-(ii), B-(iv), C-(iii), D-(i)

d) A-(iii), B-(iv), C-(ii), D-(i)

21. Dragonflies are used to get rid of

a) mosquitoes b) aphids c) butterfly caterpillars d) both (a) and (b).

22. Unicellular symbiotic organisms improve yield of legumes by

a) fixing atmospheric nitrogen without colonising roots of host plant

b) fixing atmospheric nitrogen and colonising roots of host plant

c) inducing the host plant to absorb more phosphorus

d) stimulating the host plant to become tolerant to drought

23. Wine yeast is

a) Saccharomyces ellipsoidens b) S.sake c) S.pireformis d) S.Cerevisiae

24. Select the correct group of biocontrol agents.

a) Trichodemia, Baculovirus, Bacillus thuringiensis b) Osciliatoria, Rhizobium, Trichoderma

c) Nostoc, Azospirillium, Nucleopoly_hedrovirus

d) Bacillus thuringiensis, Tobacco mosaic virus, Aphids

25. Which of the following statements is/are correct?

a)

The important examples of cyanobacteria as biofertilisers are Anabaena, Nostoc and Oscillatoria.

b) All of these c) In paddy fields, cyanobacteria serve as an important biofertiliser.

d)

Vermicompost consists of organic matter prepared by the action of earthworms on human or animal waste.

26. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :

Assertion: An organ transplant patient if not provided with cyclosporin A may reject the transplanted organ.

Reason: Cyclosporin A inhibits activation of T-cells and interferes with destruction of non-self cells.

a) If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

27. Statins used for lowering blood cholesterol level are extracted from

a) algae b) bacteria c) viruses d) yeast

28. The inoculum is added to the fresh milk in order to convert milk into curd, the term 'inoculum' here refers to
    a) a starter rich in vitamin B_{12} b) a starter rich in proteins
    c) a starter containing millions of LAB d) an aerobic digester.

29. Study the given differences between primary sludge and activated sludge and select the incorrect ones.

	Primary sludge	**Activated sludge**
(i)	It is sludge formed during primary sewage treatment.	It is sludge formed during secondary sewage treatment
(ii)	It possesses flocs of decomposer microbes	It does not possess flocs of decomposer microbes.
(iii)	It does not require aeration.	Formation of activated sludge requires aeration,
(iv)	A lot of decomposition occurs during formation of primary sludge.	Very little decomposition occurs during formation of activated sludge.

    a) (i) and (ii) b) (ii) and (iv) c) (i), (iii) and (iv) d) (ii) and (iii)

30. The purpose of biological treatment of waste water is to
    a) reduce BOD b) increase BOD c) reduce sedimentation d) increase sedimentation.

31. The masses of bacteria held together by slime and fungal filaments to form mesh-like structures are called as
    a) primary sludge b) flocs c) activated sludge d) anaerobic sludge.

32. Probiotics are _____.
    a) cancer inducing microbes b) new kind of food allergens
    c) live microbial food supplement d) safe antibiotics

33. Select the correct option to fill up the blanks.
    (i) _____ are used in detergent formulations and are helpful in removing oily stains from the laundry.
    (ii) _____ are ripened by growing Penicillium roqueforti on them.
    (iii) _____ are produced without distillation whereas, _____are produced by distillation of the fermented broth.
    (iv) _____ antibiotic was used to treat American soldiers wounded in world war II.
    (v) _____ is also called as kusht rog.
    a)
    (i) Lipases, (ii) Camembert cheese, (iii) Whisky and rum, wine and beer, (iv) Penicillin, (v) Leprosy
    b)
    (i) Lipases, (ii) Roquefort cheese, (iii) Wine and beer, whisky and rum, (iv) Penicillin, (v) Leprosy

c)
(i) Streptokinases, (ii) Roquefort cheese, (iii) Wine and beer, whisky and rum, (iv) Streptomycin, (v) Whooping cough

d)
(i) Amylases, (ii) Swiss cheese, (iii) Whisky and rum, wine and beer, (iv) Penicillin, (v) Diphtheria

34. Methanogenic bacteria are not found in
a) rumen of cattle b) gobar gas plant c) bottom of water-logged paddy fields
d) activated sludge.

35. Formented beverage with maximum alcohol content is
a) Beer b) Brandy c) Whisky d) Gin

36. Microbe used for biocontrol of pest butterfly caterpillars is
a) Saccharomyces cerevisiae b) Bacillus thuringiensis c) Streptococcus sp.
d) Trichoderma sp.

37. The symbiotic association between fungi and roots of higher plants is referred to as
a) lichen b) mycorrhiza c) biofertiliser d) biocontrol agent

38. Big holes in Swiss cheese are made by a
a) a machine b) a bacterium that produces methane gas
c) a bacterium producing a large amount of carbon dioxide
d) a fungus that releases a lot of gases during its metabolic activities

39. The chemical substances produced by some microbes which can kill or retard the growth of other microbes are called
a) antiseptics b) antacids c) antibiotics d) all of these.

40. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as:
Assertion: Secondary treatment of sewage is also called biological treatment while primary treatment is called physical treatment.
Reason: Primary sewage treatment depends only upon sedimentation properties of materials present in sewage and filtration.
a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false. d) If both assertion and reason are false.

41. Which of the following is mainly produced by the activity of anaerobic bacteria on sewage?
a) Mustard gas b) Marsh gas c) Laughing gas d) Propane

42. _____ produced by bacterium Streptococcus and modified by genetic engineering is used as a clot buster for removing clots from the blood vessels of patients who have undergone myocardial infarction leading to heart attack.
a) Lipase b) Streptokinase c) Cyclosporin A d) Antibiotic streptomycin

43. The nutritive medium for growing bacteria and many fungi in laboratory is called

a) growth media b) suspension media c) culture media d) colonial media.

44. Azolla pinnata has been found to be an important biofertiliser for paddy crops. This quality is due to the presence of
a) N_2 fixing bacteria b) N_2 fixing cyanobacteria c) mycorrhizae d) all of these

45. Methanogens do not produce
a) oxygen b) methane c) hydrogen sulphide d) carbon dioxide.

46. An organism used as a biofertiliser for raising soyabean crops is _____.
a) Azotobacter b) Azospirillum c) Rhizobium d) Nostoc

47. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
Assertion: Biofertilisers are preferred to chemical fertilisers.
Reason: Chemical fertilisers are generally more expensive and hazardous to environment.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false

48. Which of the following food items is produced by the fermenting activity of microbes?
A. Idli
B. Dosa
C. Toddy
D. Cheese
a) A and C b) C and D c) A, B and C d) A, B, C and D

49. A free living nitrogen fixing cyanobacterium which also forms symbiotic association with the water fern Azolla is:
a) Tolypothrix b) Chlorella c) Nostoc d) Anabaena

50. Match the following list of bioactive substances and their roles.

Bioactive Substance	**Role**
(i) Statin	(A) Removal of oil stains
(ii) Cyclosporin A	(B) Removal of clots from blood vessels
(iii) Streptokinase	(C) Lowering of blood cholesterol
(iv) Lipase	(D) Immuno-suppressive agent

a) i-(B), ii-(C), iii-(A), iv-(D) b) i-(D), ii-(B), iii-(A), iv-(C) c) i-(D), ii-(A), iii-(B), iv-(C)
d) i-(C), ii-(D), iii-(B), iv-(A)

51. Yeast is used in the production of _____.
a) Citric acid and lactic acid b) Lipase and Pectinase c) Bread and beer
d) Cheese and butter

52. Biogas is produced by
a) aerobic breakdown of biomass b) anaerobic breakdown of biomass
c) with the help of methanogenic bacteria d) both (b) and (c).

53. Modern detergents contain enzyme preparations of _____.
a) Acidophiles b) Alkaliphiles c) Thermoacidophiles d) Thermophiles

54. Identify the blank spaces A, B, C and D in the following table and select the correct answer.

Type of microbe	Scientific name	Commercial product
Bacterium	**A**	Streptokinase
B	Aspergillus niger	Citric acid
Fungus	Trichoderma polysporum	**C**
Bacterium	**D**	Butyric acid

A - Streptococcus
B - Fungus
C - Cyclosporin A
a) D - Clostridium butylicum

A - Clostridium butylicum
B - Streptococcus
C - Fungus
b) D - Cyclosporin A

A - Streptococcus
B - Yeast
C - Cyclosporin A
c) D - Lactobacillus

A - Streptococcus
B - Cyclosporin A
C - Statins
d) D - Clostridium butylicum

55. Wastewater treatment generates a large quantity of sludge, which can be treated by
a) anaerobic digesters b) floc c) chemicals d) oxidation pond

56. Which of the following statements is incorrect?
a)
Word antibiotic is a misnomer. Anti is a Greek word that means 'against', and bios means 'life', together they mean 'against life' (in the context of disease causing organisms); whereas with reference to human beings, they are 'pro life' and not against.
b)
Flocsare massesof bacteria with interwoven fungal filaments which form mesh-like structures.
c)
Components of biogas are methane (50 - 70%), carbon dioxide (30 - 40%) and traces of hydrogen, nitrogen and H_2S.
d) None of these

57. Read the following statements and select the correct option.
Statement 1 : BOD represents the amount of dissolved oxygen that would be consumed if all the organic matter in one litre of water were oxidised by microorganisms.
Statement 2 : High value of BOD indicates that water is highly polluted by organic matter.
a) Both statements 1 and 2 are correct.
b) Statement 1 is correct but statement 2 is incorrect
c) Statement 1 is incorrect but statement 2 is correct.
d) Both statements 1 and 2 are incorrect

58. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as:
Assertion: Toddy becomes unpalatable after 24 hours.
Reason: The fermentation of toddy is continued by naturally occurring yeasts.

a) If both assertion and reason are true and reason is the correct explanation of assertion.

b)
If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

59. What would happen if oxygen availability to activated sludge flocs is reduced?
    a) It will slow down the rate of degradation of organic matter.

    b)
    The center of flocs will become anoxic, which would cause death of bacteria and eventually breakage of flocs

    c) Flocs would increase In size as anaerobic bacteria would grow around flocs.

    d) Protozoa would grow in large numbers

60. What is agent orange?
    a) A biodegradable insecticide b) A weedicide containing dioxin
    c) Colour used in fluorescent lamp d) A hazardous chemical used in lurninous paints

61. Which of the following is responsible for yoghurt formation?
    a. Streptococcus thermophilus
    b. Lactobacillus acidphilus
    c. Lactobacillus bulgaricus
    d. Streptococus cremoris
    a) a, b, & c b) a, d & c c) a & c d) a & d

62. Bacillus thuringiensis is used to control
    a) bacterial pathogens b) fungal pathogens c) nematodes d) insect pests.

63. What gases are produced in anaerobic sludge digesters?
    a) Methane and CO_2 only b) Methane, Hydrogen Sulphide and CO_2
    c) Methane, Hydrogen Sulphide and O_2 d) Hydrogen Sulphide and CO_2

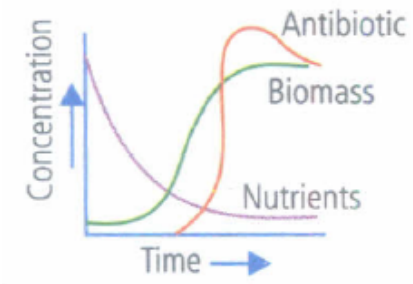
64. Match the following list of microbes and their importance:

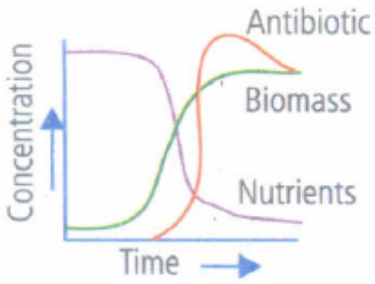
a.	Sacharomyces cerevisiae	(i)	Production of immunosuppressive agents
b.	Monascus Purpureus	(ii)	Ripening of swiss cheese
c.	Trichoderma polysporum	(iii)	commercial production of ethanol
d.	Propionibacterium sharmanii	(iv)	Production of blood cholesterol lowering agents

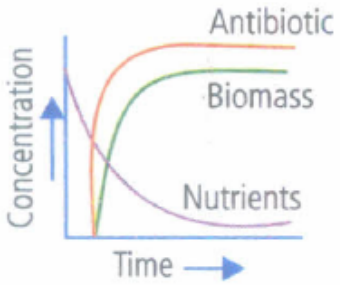
    a) a(iii), b(i), c(iv), d(ii) b) a(iii), b(iv), c(i), d(ii) c) a(iv), b(iii), c(ii), d(i)

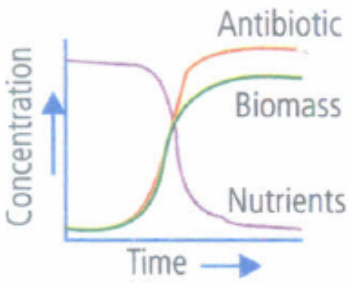
    d) a(iv), b(ii), c(i), d(iii)

65. Which of the following curves correctly represents the process of antibiotic production by Streptomyces sp.?

a) 

b) 

c) 

d) 

66. Which of the following statements regarding baculoviruses as biocontrol agents is/are correct?

a)
The majority of baculovirus used as biocontrol agents are included in the genus - Nucleopolyhedrovirus

b)
Infection with baculoviruses occurs when susceptible hosts (e.g., some specific insects) eat virus particle present on foliage and dies.

c)
These are important in organic farming because of their specific action on harmful insects without causing any damage to beneficial insects as well as to the environment.

d) All of these

67. Match column I with column II and select the correct option from the codes given below.

Column I	**Column II**
A. Statins	(i) Biogas
B. Dung	(ii) Saccharomyces cerevisae
C. Ethanol production	(iii) Monascus purpureus
D. Cydosporin A	(iv) Trichoderma polysporum

a) A-(iii), B-(i), C-(iv), D-(ii) b) A-(i), B-(iii), C-(iv), D-(ii) c) A-(iii), B-(ii), C-(iv), D-(i)

d) A-(iii), B-(i), C-(ii), D-(iv)

68. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :

Assertion: Most orchid seedlings cannot develop well in the absence of fungal mycelium.
Reason: Fungal mycelium increases efficiency of absorption only.

a) If both assertion and reason are true and reason is the correct explanation of assertion

b) If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false. d) If both assertion and reason are false.

69. Which of the following microbes is a proteinacious infectious agent?

a) Fungi b) Prions c) Bacteria d) Protozoa

70. Which of the following can be used as a biocontrol agent in the treatment of plant disease?

a) Chlorella b) Anabaena c) Lactobacillus d) Trichoderma

71. Which of the following steps is taken by the Ministry of Environment and Forests to protect rivers from water pollution?
    a) Ganga Action Plan b) Narmada Action Plan c) Yamuna Action Plan
    d) Both (a) and (c)

72. Monascus purpureus is a yeast used commercially in the production of:
    a) Citric acid b) Blood cholesterol lowering statins c) Ethanol
    d) Streptokinase for removing clots from the blood vessel

73. Which of the following statements is/are incorrect?
    (i) Cyanobacteria are autotrophic microbes widely distributed in aquatic and terrestrial habitats
    (ii) Anabaena, Nostoc and Oscillatoria are photosynthetic N_2 - fixing cyanobacteria
    (iii) Tolypothrix (BGA) can increase rice production by about 20%.
    (iv) BGA add organic matter to the soil and increase its fertility.
    (v) In our country, biofertilisers are not available commercially in the markets for farmers.
    a) (v) Only b) (iv) Only c) (iii) Only d) None of these

74. Trichoderma harzianum has proved to be a useful microorganism for
    a) gene transfer in higher plants b) biological control of soil-borne plant pathogens
    c) bioremediation of contaminated soils d) reclamation of wastelands.

75. The primary treatment of wastewater involves the removal of
    a) dissolved impurities b) stable particles c) toxic substances d) harmful bacteria

76. When domestic sewage mixes with river water
    a) small animals like rats will die after drinking river water
    b) the increased microbial activity releases micronutrients such as iron
    c) the increased microbial activity uses up dissolved oxygen
    d) the river water is still suitable for drinking as impurities are only about 0.1 %.

77. Bacillus thuringiensis (Bt) strains have been used for designing novel
    a) biofertilisers b) bio-metallurgical techniques c) bio-mineralisation process
    d) bio-insecticidal plants.

78. Read the following statements and select the correct option.
    Statement 1: Besides curdling of milk, LAB also improve its nutritional quality by increasing vitamin B_{12}.
    Statement 2: LAB, when present in human stomach, check disease causing microbes.
    a) Both statements 1 and 2 are correct.
    b) Statement 1 is correct but statement 2 is incorrect
    c) Statement 1 is correct but statement 2 is incorrect
    d) Both statements 1 and 2 are incorrect

79. In the sewage treatment, bacterial flocs are allowed to sediment in a settling tank. This sediment is called as
    a) inactivated sludge b) activated sludge c) primary sludge d) secondary sluge

80. Suppression of reproduction of one type of organism by utilising some features of its biology or physiology to destroy it or by use of another organism is known as _____.
a) comperition b) predation c) biological control d) physiological control

81. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
Assertion: Energy value of biogas is lower than that of organic matter.
Reason: Biogas minimises the chances of spread of fecal pathogens
a) If both assertion and reason are true and reason is the correct explanation of assertion
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false

82. Which of the following in sewage treatment removes suspended solid?
a) Secondary treatment b) Primary treatment c) Sludge treatment d) Tertiary treatment

83. Biofertilisers are
a) some bacteria and cyanobacteria b) fertilisers formed by ploughing in barseem
c) fertilisers obtained by decay of dead organisms
d) fertilisers prepared by mixing cattle dung with crop residues

84. Which one of the following help in absorption of phosphorus from soil by plant?
a) Glomus b) Rhizobium c) Frankia d) Anabaena

85. Biogases produced during sewage treatment are:
a) H_2S, CH_4, SO_2 b) H_2S, N_2, CH_4 c) CH_4, H_2S, CO_2 d) CH_4, O_2, H_2S

86. Biofertilisers include:
a) Blue - green algae, rhizobia, other nitrigen-fixing bacteria and mycorrjiza fungi
b) Green algae, rhizobia and other nitrogen-fixing bacteria
c) Rhizobia, other nitrogen-fixing bacteria and brown algae
d) Blue green algae, rhizobia mycorrhizae funi and ref algae

87. In batch fermentation
a) substrates are added to the system all at once and runs until product is harvested
b)
nutrients are continuously fed into the reactor and the product is siphoned off during the run
c) new batches of microorganisms are screened for increase yield
d) small-scale production is used to synthesise product

88. Clot buster enzyme with firbrinolytic effect is
a) HMG CoA reductase b) Glucoamylase c) Stretokinase d) Protease

89. Streptomycin is obtained from
a) Streptomyces griseus b) S. cerevisiae c) S. venezuelae d) S. rimosus

90. Nitrogen fixing microbe associated with Azolla in rice field is.
a) Frankia b) Tolypothrix c) Spirulina d) Anabaena

91. Which one of the foliowing is not a biofertiliser?

a) Agrobacterium b) Rhizobium c) Nostoc d) Mycorrhiza

92. Which of the following options includes biofertilisers?
    a) Cowdung manure and farmyard waste
    b) A quick, growing crop and ploughed back into the field c) Nostoc, Oscillatoria
    d) All of these

93. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as:
    Assertion: Streptococcus thermophilus increases nutritional value of milk.
    Reason: Curd and yoghurt have higher vitamin content than milk.
    a) If both assertion and reason are true and reason is the correct explanation of assertion
    b) If both assertion and reason are true but reason is not the correct explanation of assertion
    c) If assertion is true but reason is false. d) If both assertion and reason are false

94. Biogas contains
    a) 30% - 40% methane b) 50% - 70% CO_2 c) 50% - 70% methane d) 20% methane

95. Biopesticides are
    a) the chemicals which are used to destroy the pests
    b) the living organisms or their products which are used for the pest control
    c) the organisms which destroy the crops d) none of these.

96. Biological control component is central to advanced agricultural production. Which of the following is used as a third generation pesticide?
    a) Pathogens b) pheromones c) Insect repellents d) Insect hormone analogues

97. The reason that the chemical/synthetic fertilisers should be replaced by biofertilisers is that the former
    a) are source of environmental pollution b) are expensive
    c) exhaust the valuable energy resources for their manufacture d) all of these

98. Which of the following antibiotics was extensively used to treat American soldiers wounded in World War II?
    a) Neomycin b) Bacitracin c) Chloramphenicol d) Penicillin

99. Read the following statements and select the correct option.
    Statement 1: Biocontrol refers to the use of biological methods for controlling plant diseases and pests.
    Statement 2: Use of biocontrol measures will greatly reduce our dependence on toxic chemicals and pesticides.
    a) Both statements 1 and 2 are correct.
    b) Statement 1 is correct but statement 2 is incorrect
    c) Statement 1 is incorrect but statement 2 is correct
    d) Both statements 1 and 2 are incorrect.

100. Cyanobacteria are
    a) heterotrophs b) chemotrophs c) autotrophs d) organotrophs

101. Which of the following antibiotics is not correctly matched with the source from which it is obtained?

a)

Antibiotic	Source
Penicillin	Penicillium chrysogenum

b)

Antibiotic	Source
Bacitracin	Bacillus licheniformis

c)

Antibiotic	Source
Griseofulvin	Penicillium griseofulvum

d)

Antibiotic	Source
Streptomycin	Bacillus griseus

102. An advantage of using yeasts rather than bacteria as recipient cells for the recombinant DNA of eukaryotes is that yeasts can

a) produce restriction enzymes b) excise introns from the RNA transcript

c) remove methyl groups d) reproduce more rapidly.

103. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :

Assertion: Rennet and fruit extract of Withania somnifera have antagonistic functions.

Reason: Rennet is obtained from calf's liver and is used for curdling of milk.

a) If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

104. Mycorrhiza does not help the host plant in

a) enhancing its phosphorus uptake capacity b) increasing its tolerance to drought

c) enhancing its resistance to root pathogens d) increasing its resistance to insects.

105. Which one of the following pairs is wrongly matched?

a) Alcohol - nitrogenase b) Fruit juice - Pectinase c) Textile - amylase

d) Detergents - lipase

106. Which of the following bacteria is present in the rumen of cattle?

a) Azotobacter b) Rhizobium c) Methanobacterium d) Azospirillum

107. Which of the following is correctly matched for the product produced by them?

a) Methanobacterium: Lactic acid b) Penicillium notatum: Acetic acid

c) Saccharomyces cerevisiae: Ethanol d) Acetobacter aceti: Antibiotics

108. Integrated Pest Management (IPM) discourages the excessive use of

a) biological methods b) chemical pesticides c) mechanical methods d) all of these

109. Match the following columns and select the correct option.

Column-I	Column-II
(a) Clostridium bretylicum	(i) Cyclosporin-A
(b) Trichodermapolysporum	(ii) Butyric Acid
(c) Monascus purpureus	(iii) Citric Acid
(d) Aspergillus niger	(iv) Blood cholesterol lowering agent

a) (i) (ii) (iv) (iii) b) (iv) (iii) (ii) (i) c) (iii) (iv) (ii) (i) d) (ii) (i) (iv) (iii)

110. Which of the following is not a nitrogen, fixing organism?
a) Nitrosomonas b) Rhizobium lehuminosarm c) Nostac d) Anabaena

111. BOD of wastewater is estimated by measuring the amount of
a) total organic matter b) biodegradable organic matter c) oxygen evolution
d) oxygen consumption.

112. A nitrogen-fixing microbe associated with Azolla in rice fields is _____ .
a) Spirulina b) Anabaena c) Frankia d) Tolypothrix

113. The term antibiotic was first used by _____.
a) Flemming b) Pasteur c) Waksman d) Lister

114. Farmers have reported over 50% higher yields of rice by using which of the following biofertilisers?
a) Bacillus thuringiensis b) Legume - Rhizobium symbiosis c) Mycorrhizae
d) Azolla pinnata

115. Flocs are
a) Formed in primary setting tank b) Masses of fungal hyphase and green algae
c) Masses of bacteria associated with fungal filaments d) Formed in seconday settling tank

116. Enzyme which has the fibrinolytic effect is
a) protease b) amylase c) lipase d) streptokinase

117. Ethanol is commercially produced through a particular species of _____.
a) Saccharomyces b) Clostridium c) Trichoderma d) Aspergillus

118. Organic farming does not include
a) green manures b) chemical fertilisers c) farmyard manures d) compost

119. A drug used for patient A is obtained from the organism B. Identify A and B in the above statement and select the correct answer

a)

A	**B**
Swine flu	Monascus purpureus

b)

A	**B**
AIDS	Pseudomonas denitrificans

c)

A	**B**
Heart	Penicillium chrysogenum

d)

A	**B**
Organ transplant	Trichoderma polysporum

120. Which one of the following equipments is essentially required for growing microbes on a large scale, for industrial production of enzymes?
a) Sludge digest b) Industrial oven c) Bioreactor d) BOD incubator

121. Which of the following is not used as a biopesticide?
a) Trichoderma harzianum b) Nucleopolyhedrovirus c) Xanthomonas campestris
d) Bacillus thuringiensis

122. Match column I with column II and select the correct answer from the given codes

Column I	**Column II**
A. Ganga action plan	(i) N_2 fixing
B. Bt cotton	(ii) Ministry of environment and forests

Column I	Column II
C. Rhizobium	(iii) Insect resistant plant
D. Nostoc	(iv) N_2 fixing bacterium

a) A-(ii), B-(iii), C-(iv), D-(i) b) A-(iii), B-(ii), C-(iv), D-(i) c) A-(ii), B-(iv), C-(iii), D-(i)

d) A-(i), B-(iii), C-(ii), D-(iv)

123. In the following questions, a statement of assertion is followed by a statement of reason. Mark the correct choice as:
Assertion: Integrated pest management (IPM) programme at the same time deals with conservation of insects and destruction of insects.
Reason: IPM programmes are specially used in dealing with ecologically sensitive areas.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false

124. Study the following statements and select the incorrect ones
(i) Physical removal of large and small particles through filtration and sedimentation is called primary sewage treatment.
(ii) Secondary sewage treatment is mainly a mechanical process.
(iii) Activated sludge sediment in a sewage treatment plant is a rich source of aerobic bacteria.
(iv) Biogas, commonly called as gobar gas, is pure methane.
a) (i) and (ii) b) (ii) and (iv) c) (ii) and (iii) d) (iii) and (iv)

125. One of the major difficulties in the biological control of insect pests is the _____.
a) practical difficulty of introducing the predator to specific areas
b) method is less effective as compared with ihe use of insecticides
c) predator does not always survive when transferred to a new environment
d) the predator develops a preference to other diets and may itself become a pest

126. Which of the following diseases are treated by antibiotics?
(i) Plague
(ii) Diphtheria
(iii) Leprosy
(iv) Whooping cough
a) (i), (ii) and (iii) b) (i), (iii) and (iv) c) (ii), (iii) and (iv) d) (i), (ii), (iii) and (iv)

127. Match the following organisms with the products they produce

(a) Lactobacillus	(i) Cheese
(b) Saccharomyces cerevisiae	(ii) Curd
(c) Aspergillus niger	(iii) citric acid
(d) Acetobacter acetic	(iv) Bread
	(v) Acetic Acid

a) (ii) (iv) (iii) (v) b) (iii) (iv) (v) (i) c) (ii) (i) (iii) (v) d) (ii) (iv) (v) (iii)

128. The free-living fungus Trichoderma can be used for:

a) killing insects b) biological control of plant diseases c) controlling butterfly caterpillars
d) producing antibiotics.

129. Which of the following is put into Anaerobic sludge digester for further sewage treatment?
a) Effluents of primary treatment b) Activated sludge c) Primary sludge
d) Floating debris

130. Which one of the following population interactions is widely used in medical science for the production of antibiotics?
a) Parasitism b) Mutualism c) commensalism d) Amensalism

131. Which of the following statements is not correct regarding mycorrhiza?
a) It helps in absorption of phosphorus from the soil
b) It is a symbiotic association of fungi with the roots of higher plants
c) It helps the plant in developing resistance to root- borne pathogens d) None of these

132. Which of the following is widely used as a successful biofertiliser in Indian rice fields?
a) Rhizobium b) Acacia arabica c) Acalypha indica d) Azolla pinnata

133. Match column I with column II and select the correct answer from the given codes.

Column I	**Column II**
A. 	(i) Adenovirus
B. 	(ii) Tobacco Mosaic Virus
C. 	(iii) Bacteriophage

a) A-(i), B-(ii), C-(iii) b) A-(ii), B-(i), C-(iii) c) A-(iii), B-(ii), C-(i) d) A-(iii), B-(i), C-(ii)

134. Which of the following statements is incorrect?
a)
Word antibiotic is a misnomer. Anti is a Greek word that means 'against', and bios means 'life', together they mean 'against life' (in the context of disease causing organisms); whereas with reference to human beings, they are 'pro life' and not against.
b)
Flocs are masses of bacteria with interwoven fungal filaments which form mesh-like structures.

c)
Components of biogas are methane (50 - 70%), carbon dioxide (30 - 40%) and traces of hydrogen, nitrogen and H_2S.

d) None of these

135. Match the items in column 'A' and column 'B' and choose correct answer

Column A	**Column B**
(i) Lady bird	(A) Methanobacterium
(ii) Mycorrhiza	(B) Trichoderma
(iii) Biological control	(C) Aphids
(iv) Biogas	(D) Glomus

The correct answer is

a) (i)-B, (i)-D, (iii)-C, (iv)-A b) (i)-C, (ii)-D, (iii)-B, (iv)-A c) (i)-D, (ii)-A, (iii)-B, (v)-C

d) (i)-C, (ii)-B, (iii)-A, (iv)-D.

136. Which of the following is included in biopesticide?

a) Viruses and bacteria only b) Viruses , archaebacteria and fungi only

c) Viruses , Bacteria, fungi insects d) Viruses , bacteria , fungi and nematodes

137. __ is the first step of sewage treatment.

a) Precipitation b) Chlorination c) Sedimentation d) Aeration

138. Which of the following is pair of bio- fertilisers?

a) Azolla and BGA b) Nostoc and legumes c) Rhizobium and grasses

d) Salmonella and E. coli

139. An example of endomycorrhiza is :

a) Glomus b) Agaricus c) Nostoc d) Rhizobium

140. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :

Assertion: Nucleic acid complexes alone cannot cause diseases.

Reason: Only nucleoproteins can function as infectious agents.

a) If both assertion and reason are true and reason is the correct explanation of assertion

b) If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false d) If both assertion and reason are false.

141. Which one of the following is not a nitrogen-fixing organism?

a) Anabaena b) Nostoc c) Azotobacter d) Pseudomonas

142. The aquatic fern, which is an excellent biofertiliser is _____.

a) Azolla b) Pteridium c) Salvinia d) Marselia

143. A sewage treatment process in which a part of decomposer bacteria present in the wastes is recycled into the starting of the process is called as

a) primary treatment b) activated sludge treatment c) tertiary treatment

d) none of these.

144. Dough kept overnight in warm weather becomes soft and spongy because of _____.

a) absorption of carbon dioxide from atmosphere b) fermentation c) cohesion
d) osmosis

145. Which one of the following alcoholic drinks is produced without distillation?
a) Wine b) Whisky c) Rum d) Brandy

146. A microbial biocontrol agent that can be used to control butterfly caterpillars is
a) Trichoderma polysporum b) Bacillus thuringiensis c) Streptococcus d) mycorrhiza

147. The vitamin whose content increases following the conversion of milk into curd by lactic acid bacteria is
a) vitamin C b) vitamin O c) vitamin B_{12} d) vitamin E

148. Human insulin is being commercially produced from a transgenic species of _____.
a) Escherichia b) Mycobacterium c) Rhizobium d) Saccharomyces

149. Nitrogen fixation in root nodules of Alnus is brought about by
a) Frankia b) Azorhizobium c) Bradyrhizobium d) Clostridium

150. Match column I with column II and select the correct answer from the given codes.

Column I	**Column II**
A. Methanogens	(i) BOD
B. Fermentors	(ii) Methane rich fuel gas
C. Organic waste in water	(iii) Production of methane
D. Biogas	(iv) Large vessels for growing microbes

a) A - (ii), B - (i), C - (iv), D - (iii) b) A - (iii), B - (iv), C - (i), D - (ii)
c) A - (ii), B - (iv), C - (iii), D - (i) d) A - (iv), B - (iii), C - (ii), D - (i)

151. Biofertilisers are organisms that enrich the nutrient quality of the soil. Which of the following can be used as biofertilisers?
a) Nitrogen fixing cyanobacteria b) Nitrogen fixing bacteria c) Mycorrhizae
d) All of these

152. The residue left after methane production from cattle dung is
a) burnt b) burried in land fills c) used as manure d) used in civil construction

153. Which one thing is not true about antibiotics?
a) The tenn 'antibiotic' was coined by Selman Waksman in 1942.
b) first antibiotic was discovered byAlexander Flemming.
c) Each antibiotic is effective only against one particular kind of germ.
d) Some persons can be allergic to a particular antibiotic.

154. Select the correct statement from the following?
a) Biogas is produced by the activity of aerobic bacteria on animal waste.
b) Methanobacterium is an aerobic bacterium found in rumen of cattle.
c) Biogas, commonly called gobar gas, is pure methane
d)
Activated sludge - sediment in settlement tanks of sewage treatment plant is a rich source of aerobic bacteria.

155. Living organisms used to enrich the nutrient quality of the soil are called as
a) biocontrol agents b) biofertilisers c) synthetic fertilisers d) natural fertilisers

156. Which one of the following is not used in organic farming?
a) Glomus b) Earthworm c) Oscillatoria d) Snail

157. Dosa and idli are fermented preparation of rice and Black Gram. The Fermentation is done with
a) Leuconnostoc b) Streptococcus c) Saccharomyces
d) More than one option are correct

158. In which stage of sewage treatmnet desalination and champion of water is done?
a) Primary treatmnet b) Secondary treatment c) Tertitary treatment d) Both (1) & (2)

159. Which of the following statements is correct with regard to biocontrol agents?
a) Ladybird and dragonflies are used to get rid of aphids and mosquitoes respectively.
b) Bacillus thuringiensis bacteria are used to control butterfly caterpillars.
c) Trichoderma species are used to control several plant pathogens. d) All of these

160. Antibiotics are obtained from
a) bacteria b) fungi c) actinomycetes d) all of these.

161. Match column I with column II and select the correct answer from the given codes.

Column I	**Column II**
A. The stage in which of physical treatment of sewage is done	(i) Anaerobic digestion activated sludge and production of biogas
B. The stage in which biological treatment of sewage is done	(ii) Activated sludqe
C. Name of the sediment in primary treatment	(iii) Aeration tanks
D. It is carried to aeration tanks from primary settling	(iv) Primary effluent
E. Name of the sediment in secondary treatment	(v) Primary sludge
F. Site of flocs growth	(vi) Secondary treatment
G. Function of sludge digester	(vii) Primary treatment

a) A - (vii), B - (vi), C - (v), D - (iv), E - (ii), F - (iii), G - (i)
b) A - (i), B - (iii), C - (v), D - (vii), E - (ii), F - (iv), G - (vi)
c) A - (i), B - (ii), C - (iii), D - (iv), E - (v), F - (vi), G - (vii)
d) A - (vii), B - (vi), C - (i), D - (ii), E - (iii), F - (iv), G - (v)

162. In a microbiology laboratory, the technician uses heat to sterilise the nutrient solution that is used to grow a fungus. When the heating system broke down, he sterilised the solution by passing it (in a sterile environment) through a sterile filter with a pore size of 0.2 micrometers. When the fungus was grown on the filtered nutrient solution, it stopped growing and looked unhealthy within a few days, Which statements is the most likely explanation for the observed effects on the fungus?
a) The nutrient solution contained a virus
b) Heating makes the glucose in the nutrient solution more digestible

c) Filtering removed one of the larger nutrient molecules

d) The nutrient solution contained a bacterium that was pathogenic to the fungus.

163. Which is wrongly matched?

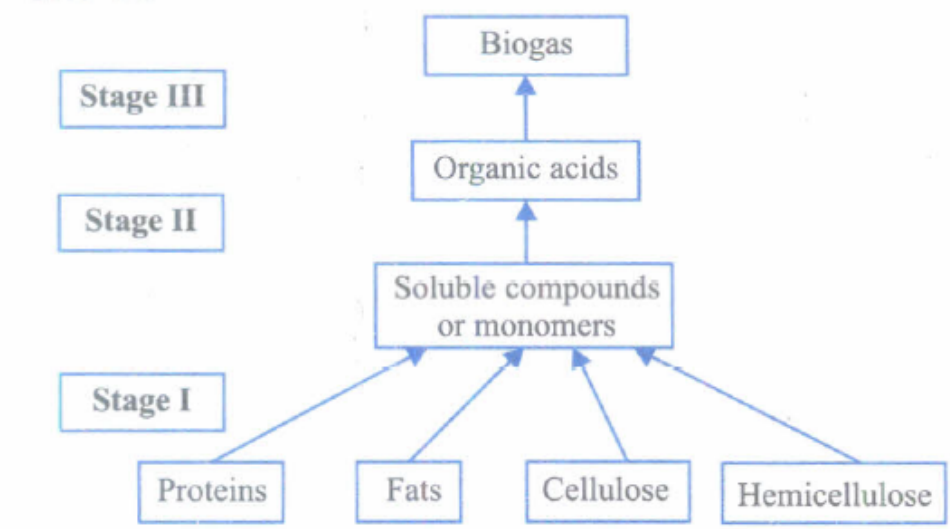
a) Clostridium butylicum - Lactic acid b) Aspergillus niger - Citric acid c) Yeast- Statins

d) Acetobacter acetic - Acetic acid

164. During the primary treatment of sewage, solid particles that settle down are called

a) flocs b) primary sludge c) activated sludge d) anaerobic sludge.

165. Biogas generation is a three stage anaerobic digestion of animal and other organic wastes. Study the following flow chart and select the correct option for stages I, II and III



a)

In stage - I, anaerobic microorganisms bring about enzymatic breakdown of complex organic compounds into simple soluble compounds or monomers.

b)

In stage - II, monomers are converted into organic acids by fermentation causing microbes.

c) In stage - III, organic acids are acted upon by methanogenic bacteria to produce biogas.

d) All of these.

166. Identify the blank spaces A, B, C and D in the following table and select the correct answer.

Type of microbe	**Scientific name**	**Commercial product**
Bacterium	**A**	Lactic acid
Fungus	**B**	Cyclosporin A
C	Monascus purpureus	Statins
Fungus	Penicillium notatum	**D**

a) A - Lactobacillus
B - Trichoderma polysporum
C - Yeast
D - Penicillin

b) A - Acetobacter
B - Trichoderma polysporum
C - Yeast
D - Streptomycin

c) A - Lactobacillus
B - Aspergillus niger
C - Algae
D - Penicillin

d) A - Lactobacillus
B - Trichoderma polysporum
C - Agaricus
D - Penicillin

167. Identify the blank spaces A, B, C and D in the table given below and select the correct answer.

Type of microbe	Scientific name	Product	Medical application
Fungus	A	Cyclosporin A	B
C	Monascus purpureus	Statin	D

A - Trichoderma polysporum,
B - As an immunosuppressive agent,
C - Yeast (Fungus),
a) D - Lowering of blood cholesterol

A - Trichoderma polysporum,
B - Lowering of blood cholesterol,
C - Yeast (Fungus),
b) D - As an immunosuppressive agent

A - Yeast (Fungus),
B - Lowering of blood cholesterol,
C - Trichoderma polysporum,
c) D - As an immunosuppressive agent

A - Streptococcus,
B - As an immunosuppressive agent,
C - Bacterium,
d) D - Lowering of blood cholesterol

168. Microbes which cannot be cultured in cell free extracts are
a) Bacteria b) Fungi c) Viruses d) Algae

169. Match column I with column II and select the correct answer from the given codes.

Column I	Column II
A. Trichoderma	(i) Free living nitrogen fixing bacteria
B. Streptomyces	(ii) Biocontrol agent
C. Azospirillum	(iii) Lactic acid
D. Lactobacillus	(iv) Source of antibiotic

a) A-(ii), B-(iii), C-(iv), D-(i) b) A-(ii), B-(iv), C-(i), D-(iii) c) A-(iii), B-(i), C-(ii), D-(iv)
d) A-(iv), B-(ii), C-(i), D-(iii)

170. Which one of the following is linked to the discovery of Bordeaux mixture as a popular fungicide?
a) Bacterial leaf blight of rice b) Downy mildew of grapes c) Loose smut of wheat
d) Black rust of wheat

171. Use of bioresources by multinational companies and organisations without authorisation from the concerned country and its people is called _____.
a) biodegradation b) biopiracy c) bio-infringement d) bioexploitation

172. Activated sludge should have the ability to settle quickly so that it can:
a) be rapidly pumped back from sedimentation tank to aeration tank.
b)
absorb pathogenic bacteria present in wastewater while sinking to the bottom of the settling tank.
c) be discarded and anaerobically digested. d) absorb colloidal organic matter.

173. Methanogens, growing anaerobically on cellulosic material produce
a) methane b) methane and carbon dioxide c) methane and hydrogen
d) methane, carbon dioxide and hydrogen

174. Biofertilisers are the living organisms which:
a) bring about soil nutrient enrichment b) maximise the ecological benefits
c) minimise the environmental hazards d) all of these.

175. First mycoherbicide of the world was obtained from

a) Trichoderma Polysporism b) Phytophthora palmivora c) Cactoblastis cactorum

d) NPV

176. Read the following statements and select the incorrect one.

a) Little decomposition occurs during the formation of primary sludge

b) Formation of primary sludge requires ample aeration

c) Activated sludge possess flocs of decomposer microbes

d) Formation of activated sludge requires aeration

177. When a natural predator (living organism) is applied on the other pathogen organisms to control them, this process is called as

a) biological control b) genetic engineering c) artificial control d) confusion technique

178. Lactobacillus acidophilus helps in formation of

a) Curd and yohurt b) Butter milk and curd c) Toghurt and Butter milk

d) Large holed swiss cheese

179. These bacteria grow anaerobically on cellulosic material, produce large amount of methane along with CO_2 and H_2 , and are collectively called as methanogens. Examples of such bacteria are

a) Methanobacterium b) Methanobrevibacter c) Methanococcus d) all of these

180. Read the following statements and select the incorrect one.

a) The dough used for making Dosa and Idli is fermented by bacteria

b) Microbes are used to ferment fish, soybean and bamboo shoots to make food

c)

The large holes in 'Swiss cheese' are due to production of large amount of CO_2 by a fungi called Propionibacterium sharmanii.

d) 'Toddy' is a traditional drink of Southern India made by fermentation by microbes.

181. In gobar gas, the maximum amount is that of :

a) Propane b) Methane c) Butane d) Carbon dioxide

182. Match the following list of bacteria and their commercially important products.

Bacterium	**Product**
(i) Aspergillus niger	(A) Lactic acid
(ii) Acetobacter aceti	(B) Butyric acid
(iii) Clostridium butylicum	(C) Acetic acid
(iv) Lactobacillus	(D) Citric acid

a) i-(B), ii-(C), iii-(D), iv-(A) b) i-(B), ii-(D), iii-(C), iv-(A) c) i-(D), ii-(C), iii-(B), iv-(A)

d) i-(D), ii-(A), iii-(C), iv-(B)

183. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :

Assertion: Dragonflies can be used to decrease occurrence of diseases like malaria, dengue, etc.

Reason: Baculoviruses are effective in controlling many insects and other arthropods.

a) If both assertion and reason are true and reason is the correct explanation of assertion

b) If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false d) If both assertion and reason are false

184. Which one of the following can be used as biofertiliser in cotton field?
a) Azolla-Anabaena b) Streptococcus c) Azospirillum d) Azotobacter chroococcum

185. Study the following statements regarding lactic acid bacteria (LAB) which are used to convert milk into curd
(i) They produce acids that coagulate and partially digest the milk proteins.
(ii) A small amount of curd added to the fresh milk as an inoculum contains millions of LAB, which at suitable temperature, multiply and convert milk into curd.
(iii) Conversion of milk into curd improves its nutritional quality by increasing vitamin B12.
(iv) LAB may result in acidity in the stomach of human beings.
Which of the given statements are correct?
a) (i) and (ii) b) (ii) and (iii) c) (i), (ii) and (iii) d) (i), (ii), (iii) and (iv)

186. The technology of biogas production from cow dung was developed in India largely due to the efforts of
a) Gas Authority of India b) Oil and Natural Gas Commission

c) Indian Agricultural Research Institute and Khadi & Village Industries Commission

d) Indian Oil Corporation.

187. Match different organisms in column I with their uses in column II and select the correct answer from the given codes

Column I	**Column II**
A. Lactobacillus acidophilus	(i) Formation of dough
B. Saccharomyces cerevisiae	(ii) Single cell proteins
C. Propionibacterium sharmanii	(iii) Conversion of milk into curd
D. Spirulina	(iv) Formation of Swiss cheese

a) A-(iii), B-(i), C-(ii), D-(iv) b) A-(iii), B-(i), C-(iv), D-(ii) c) A-(i), B-(iii), C-(iv), D-(ii)

d) A-(i), B-(iii), C-(ii), D-(iv)

188. Process of biogas production is
a) aerobic process b) anaerobic process c) active process d) passive process.

189. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
Assertion: Beer and wine are called soft liquors while gin, rum etc., are hard liquors.
Reason: Beer and wine are made without distillation.
a) If both assertion and reason are true and reason is the correct explanation of assertion.

b) If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false. d) If both assertion and reason are false.

190. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as:
Assertion: Nitrogenase enzyme gets inactivated in presence of oxygen yet N_2 fixation occurs

in aerobic cells of legume nodules.
Reason: Leghaemoglobin allows presence of oxygen just sufficient for cellular respiration only.
a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false. d) If both assertion and reason are false

191. Which of the following organisms is used in the production of beverages?
a) Penicillium notatum b) Saccharomyces cerevisiae c) Aspergillus niger
d) Clostridium butylicum

192. BOD is _____ in polluted water and _____ in potable water.
a) more, less b) less, more c) less in both d) medium in both

193. A patient brought to a hospital with myocardial infraction is normally immediately given:
a) Cyclosporin A b) Statins c) Penicillin d) Streptokinase

194. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as:
Assertion: Griseofulvin extracted from P. griseofulvum is used for ringworm treatment.
Reason: Trichophyton, Epidermophyton, etc., cannot grow well in presence of Penicillium griseofulvum.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false

195. Match column I with column II and select the correct answer from the given codes.

Column I	**Column II**
A. Azolla	(i) Symbiotic N_2 - fixer
B. Rotenone	(ii) Symbiotic association with N_2 - fixing cyanobacteria
C. Crotolaria juncea	(iii) Natural insecticide
D. Frankia	(iv) Green manure

a) A-(ii), B-(iii), C-(iv), D-(i) b) A-(ii), B-(iv), C-(iii), D-(i) c) A-(ii), B-(i), C-(iv), D-(iii)
d) A-(i), B-(iii), C-(iv), D-(ii)

196. Which of the microorganism is used for production of citric acid in industries?
a) Lactobacillus bulgaris b) Penicillium citrinum c) Aspergillus niger
d) Rhizopus nigricans

197. Which of the following options contains the end products formed during anaerobic respiration in yeast?
a) H_2O, CO_2 and energy b) H_2S, $C_6H_{12}O_6$ and energy c) CO_2, C_2H_5OH and energy
d) H_2O and CO_2

198. Which one of the following pairs is not correctly matched?
a) Streptomyces - Antibiotic b) Serratia - Drug addiction c) Spirulina - Single cell protein
d) Rhizobium - Biofertiliser

199. Fill up the blanks by selecting the correct option.

(i) Biogas is a mixture of gases which predominantly contains _____ and is used as _____

(ii) Methanogens are commonly found in the _____ during sewage treatment.

(iii) _____ species are free-living fungi and effective biocontrol agents of several plant pathogens

(i) methane, fuel,
(ii) anaerobic sludge,
a) (iii) Trichoderma

(i) CO_2, fuel,
(ii) primary sludge,
b) (iii) Trichoderma

(i) methane, fuel,
(ii) anaerobic sludge,
c) (iii) Baculoviruses

(i) methane, fuel,
(ii) aerobic sludge,
d) (iii) Trichoderma

200. Which of the following is wrongly matched in the given table?

a)

Microbe	**Product**	**Application**
Clostridium butylicum	Lipase	removal of oil stains

b)

Microbe	**Product**	**Application**
trichoderma polysporum	Cyclosporin A	immunosuppressive drug

c)

Microbe	**Product**	**Application**
Monascus Purpureus	Statins	Lowering of blood cholestrerol

d)

Microbe	**Product**	**Application**
Streptococcus	Streptokinase	removal of clot from blood vessel