

MICROBES IN HUMAN WELFARE

1. Where do we find microbes?
(A) Deep in the soil (B) In thermal vents
(C) Under layers of snow (D) All of these
2. Which of the following microbes is a proteinaceous *infectious* agent?
(A) Viruses (B) Prions
(C) Viroids (D) Protozoa
3. Which one single organism or the pair of organisms is correctly assigned to its taxonomic group?
(A) *Paramecium* and *Plasmodium* belong to the same kingdom as that of *Penicillium*.
(B) Lichen is a composite organism formed from the symbiotic association of an alga and a protozoan.
(C) Yeast used in making bread and beer is a fungus.
(D) *Nostoc* and *Anabaena* are included in kingdom Protista.
4. 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

5. Which of the following antibiotics is used to cure throat infections?
- (A) *Neomycin* (B) *Polymixis*
(C) *Tetracyclines* (D) *Viridin*
6. 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
7. 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 sludge
8. These bacteria grow anaerobically on cellulosic material, produce large amount of methane along with CO₂ and H₂, and are collectively called as methanogens. Examples of such bacteria are
- (A) *Methanobacterium*
(B) *Methanobrevibacter*
(C) *Methanococcus*
(D) all of these

9. Bio-pesticides 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
10. Cyanobacteria are
- (A) heterotrophs
 - (B) chemotrophs
 - (C) autotrophs
 - (D) organotrophs
11. Microorganisms can be grown in the bioreactors by
- (A) Support growth system
 - (B) Agitated growth system
 - (C) Suspended growth system
 - (D) Both (A) and (C)
12. One of the earliest alcoholic beverage obtained by fermentation is probably
- (A) Country made vinegar
 - (B) Fermented milk
 - (C) Fermented honey
 - (D) Beer

13. Riboflavin is

(A) Vitamin B12

(B) Vitamin B6

(C) Vitamin B2

(D) Vitamin B9

14. Commercial acetic acid is used in the preparation of

(A) Mead

(B) Vinegar

(C) Wine

(D) Alcohol

15. In this process, the nutrients and microorganisms are put into closed reactor and allowed to proceed until maximum yields have been observed

(A) Continuous process

(B) Broth process

(C) Direct process

(D) Batch process

16. The enzyme extracted from stomach of calf and used in cheese making is

(A) Lactase

(B) Rennin

(C) Calfine

(D) Cheecin

17. An undistilled alcoholic beverage produced from grain mesh fermentation

(A) Curd

(B) Rum

(C) Beer

(D) Wine

18. An undistilled alcoholic beverage produced from fruit-juice fermentation is

- (A) Vinegar
- (C) Beer

- (B) Rum
- (D) Wine

19. Some pathogenic bacteria develop resistance to antibiotics by

- (A) Modifying their cell walls
- (B) Developing such enzyme which modify antibiotics
- (C) After the antibiotics target due to spontaneous mutation
- (D) All the above

20. The microorganism used in curd formation

- (A) *Aspergillus*
- (B) *Saccharomyces*
- (C) *Lactobacillus*
- (D) *Penicillium*

21. If BOD of sample water is very high, the sample is

- (A) Highly polluted
- (B) Less polluted
- (C) Not polluted
- (D) Potable

22. The microorganism used in production of biogas

- (A) *Methanobacterium*
- (B) *Chlorella*
- (C) *Nostoc*
- (D) *Saccharomyces*

23. The two vitamins manufactured biotechnologically are

- (A) Vitamin B12 and Vitamin B6
- (B) Vitamin B12 and Vitamin B2

- (C) Vitamin B6 and Vitamin B2
- (D) Vitamin B12 and Vitamin B9

24. Conversion of sugar into alcohol during fermentation is due to the direct action of

- (A) Temperature
- (B) Microorganisms
- (C) Zymate
- (D) Concentration of sugar solution

25. The term antibiotic was coined by

- (A) Alexander Fleming
- (B) Waksman
- (C) Louis Pasteur
- (D) Edward Jenner

26. Rennet was purified by

- (A) Waksman
- (B) Fleming
- (C) Hansen
- (D) Dubrunfaut

27. Biogas production is

- (A) Single step aerobic process
- (B) Two step aerobic process
- (C) Three step aerobic process
- (D) Three step anaerobic process

28. Methanogens convert

- (A) Methyl alcohol into methane

- (B) Formic acid into methane
- (C) Acetic acid into methane
- (D) All the above

29. Primary treatment of sewage is

- (A) Physical process
- (B) Biological process
- (C) Chemical process
- (D) Biochemical process

30. Primary sludge is used for

- (A) Preparation of compost
- (B) Preparation of manure
- (C) Biogas production
- (D) All the above

31. Cyclosporin A is used for

- (A) Dissolving blood clots
- (B) Lowering cholesterol level
- (C) Immunosuppression
- (D) Enhancing tenderness of meat

32. Statin is used for

- (A) Lowering LDL cholesterol
- (B) Lipid digestion during ripening of cheese
- (C) Detergents

(D) Flavouring edibles

33. Red wine is coloured with the help of

- (A) Apple skin (B) Grape skin
(C) Apricot skin (D) Peach skin

34. Brandy is generally a product of

- (A) Cider wine (B) Lager beer
(C) Grape wine (D) Champagne

35. Hops used in flavouring a product of

- (A) Fruits of *Humulus* (B) Seeds of *Humulus*
(C) Dried petals of *Humulus* (D) Dried sepals of *Humulus*

36. Gin is flavoured with

- (A) Juniper berries (B) Acorns of Oak
(C) Apple juice (D) Cashew Apple

37. Dosa and Idli are preparations of

- (A) Wheat flour
(B) Rice
(C) Rice and Black Gram
(D) Wheat and Black Gram

38. The fermenting agent of dosa and idli is
- (A) *Saccharomyces cerevisiae*
 - (B) *Leuconostoc mesenteroides*
 - (C) *Streptococcus faecalis*
 - (D) Both B and C
39. Which of the following options includes biofertilizers?
- (A) Cowdung manure and farmyard waste
 - (B) A quick growing crop ploughed back into the field
 - (C) *Nostoc, Oscillatoria*
 - (D) All of these
40. Which of the following is a non-symbiotic biofertilizer?
- (A) VAM
 - (B) *Azotobacter*
 - (C) *Anabaena*
 - (D) *Rhizobium*
41. Nitrogen fixation in root nodules of *Alnus* is brought about by
- (A) *Frankia*
 - (B) *Azorhizobium*
 - (C) *Bradyrhizobium*
 - (D) *Clostridium*
42. Which one of the following can be used as biofertilizer in cotton field?
- (A) *Azolla-Anabanea*
 - (B) *Streptococcus*
 - (C) *Azospirillum*

(D) *Azotobacter chroococcum*

43. Wastewater treatment generates a large quantity of sludge, which can be treated by
(A) anaerobic digesters (B) floc
(C) chemicals (D) oxidation pond
44. BOD of waste water is estimated by measuring the amount of
(A) total organic matter
(B) biodegradable organic matter
(C) oxygen evolution
(D) oxygen consumption
45. Which one of the following alcoholic drinks is produced without distillation?
(A) Wine (B) Whisky
(C) Rum (D) Brandy

ANSWERS

1. D	2. B	3. C	7. D
5. B	6. B	B C	8. D D
9. B	10. C	11. B	12. D C
13.	14. C	15. D	16. D B
17.	18. A	19. A	20. B C
21.	22. B	23. C	24. D C
25.	26. A	27. D	28. C D
29.	30. B	31. C	32. C A
33.	34. C	35. D	36. C A
37.	38. A	39. D	40. A B
41.	42. A	43.	44. D
45.			

SOLUTIONS

1. Microbes are present even at sites where no other life-form could possibly exist—sites such as deep inside the geysers (thermal vents) where the temperature may be as high as 1000C, deep in the soil, under the layers of snow several metres thick, and in highly acidic environments.
2. Prions are proteinaceous infectious agents which act as catalyst converting normal protein into prion state. They are not affected by proteases, nucleases, temperature upto 800°C, UV radiations and formaldehyde.

3. The dough which is used for making bread, is fermented by baker's yeast (*Saccharomyces cerevisiae*). Besides bread, yeast fermentation is involved in beer, wine, vinegar, etc. Several traditional drinks and food items are also made by fermentation by yeast.
4. In 1940, E. Chain and H. Florey obtained a relatively stable preparation of penicillin, which was extensively used to treat wounded American soldiers in World War II.
5. Among the given antibiotics, tetracyclines, aureomycins obtained from *Streptomyces aureofaciens* is used in curing whooping cough. Some other antibiotics are also found useful e.g., chloramphenicol, erythromycin.
6. Flocs are masses of bacteria held together by slime and fungal filaments to form mesh like structures.
7. Activated sludge is formed during secondary sewage treatment. It possess flocs of decomposer microbes. Formation of activated sludge requires aeration.
8. Methanogens are microorganisms that produce methane as a metabolic byproduct in anoxic condition. They include *Methanobacterium*, *Methanobrevibacter* and *Methanococcus*.
9. Biopesticides are those biological agents or their products that are used for control of weeds and insects (pathogens). Most important example is the soil bacterium, *Bacillus thuringiensis* (*Bt*).

10. Cyanobacteria are photosynthetic, gram-negative prokaryotes. They have chlorophyll a and are probably major primary producers in the world's oceans. Hence, they are autotrophs.
39. *Oscillatoria* and *Nostoc* are nitrogen fixing cyanobacteria. They add organic matter as well as extra nitrogen to the soil. Cyanobacteria are very important and low-cost biofertilizers.
40. Bacteria, such as *Azotobacter* is free living and can fix atmospheric nitrogen in the soil, thus enriching nitrogen content of the soil.
41. *Frankia*, a nitrogen fixing mycelial bacterium (actinomycete), is associated symbiotically with root nodules of several non-legume plants like *Alnus* (Alder) *Myrica*, *Rubus* etc.
42. Cotton is dicotyledonous crop. The best biofertilizer for cotton is *Bacillus cereus* and *Azotobacter chroococcum*. These are free living N₂ fixing bacteria and enhance the fertility of soil
43. The sediment of settling tank is called activated sludge. A part of it is used as an inoculum in aeration tanks. The remaining is passed into a large tank called anaerobic sludge digester.
44. Degree of impurity of water due to organic matter is measured in terms of B.O.D. It is the oxygen in milligrams

required for five days in one litre of water at 20°C for the microorganism to metabolise organic waste.

45. Wine and beer are produced without distillation whereas whisky, brandy and rum are produced by distillation of the fermented broth.