Maximum : 100 marks

Time : 1 hour and 15 minutes

1. If a DNA sample contains 13% adenine, what percentage of the sample contains cytosine?
   (A) 13% (B) 37%
   (C) 26% (D) 74%

2. Ozonation of water is an example of ———— type of effluent treatment.
   (A) Primary (B) Preliminary
   (C) Secondary (D) Tertiary

3. Synecology deals with :
   (A) Ecology of many species (B) Ecology of many populations
   (C) Ecology of community (D) None of the above

4. Which biosensor is based on the movement of electrons?
   (A) Conductmetric (B) Potetiometric
   (C) Amperometric (D) Thermometric

5. Species that occur in different geographical regions separated by special barrier are :
   (A) Allopatric (B) Sympatric
   (C) Sibling (D) None of the above

6. The first phase contrast microscope was developed by ———— in 1933.
   (A) Hans Janssen (B) Zacharias
   (C) Frits Zernike (D) Lippershey

7. A major organism used in commercial bioleaching for copper recovery is :
   (A) *Desulfovibrio desulfuricans* (B) *Pseudomonas aeruginosa*
   (C) *Aspergillus niger* (D) *Thiobacillus ferrooxidans*

8. Which microorganism's genome was first sequenced?
   (A) *Saccharomyces cerevisiae* (B) *Haemophilus influenza*
   (C) *E.coli* (D) Mycobacterium

9. Which of the following best describes biodegradation?
   (A) A minor change in an organic molecule
   (B) Fragmentation of a complex organic molecule
   (C) Complete transformation of the organic molecule to mineral forms
   (D) All of the above

10. Who discovered the bacteria that cause cholera?
   (A) Filippo Pacini
   (B) Robert Koch
   (C) Louis Pasteur
   (D) Rudolf Virchow

11. Which of the following devices is suitable for the removal of gaseous pollutants?
   (A) Cyclone separator
   (B) Electrostatic precipitator
   (C) Wet scrubber
   (D) Fabric filter

12. "Superbug" was a name coined for organisms engineered for :
   (A) Antibiotic production
   (B) Probiotic production
   (C) Hydrocarbon degradation
   (D) Enzyme production

13. All the following are immunogenic EXCEPT :
   (A) Bacterial flagella
   (B) Haptens
   (C) Bacterialpili
   (D) Viral spikes

14. The most important organism to be eliminated from the canned food :
   (A) *Pseudomonas*
   (B) *Clostridium*
   (C) *Salmonella*
   (D) *Shigella*

15. Which of the following is used in the production of 'cry' proteins?
   (A) *Bacillus thuringiensis*
   (B) *Streptococcus mutans*
   (C) *Streptomyces griseus*
   (D) *Penicillium chrysogenum*

16. Earthworm used in vermicomposting :
   (A) *Lumbricus rubellus*
   (B) *Eisenia foetida*
   (C) *E. buchholzi*
   (D) All of the above

17. The resolution obtainable with electron microscope is in the range of :
   (A) 0.03 μm
   (B) 0.003 μm
   (C) 0.0003 μm
   (D) 0.3 µm

18. Which of the following abbreviations refers to a cultural technique for determining microorganisms in food?

(A) FDA (B) SPC

(C) FAO (D) IMC

19. Antibody diversity results from :

(A) Apoptosis (B) Antigenic shift

(C) Somatic recombination (D) Complement binding

20. SDS-PAGE is used in one of the following immunological technique :

(A) Immunodiffusion (B) Immunoprecipitation

(C) Immunoelecrophoresis (D) Western blotting

21. The *Corynebacteria* inhabit the surface of eye is an example of :

(A) Commensalism (B) Parasitism

(C) Symbiosis (D) Predation

22. Which among the following is a virus predominantly infect insects?

(A) Baculovirus (B) Adenovirus

(C) Parvovirus (D) Retro virus

23. Enzyme widely used in ice cream industry :

(A) Amylase (B) Protease

(C) Invertase (D) Phosphatase

24. Size exclusion is related to which form of chromatography :

(A) Gel filtration (B) Affinity

(C) Ion exchange (D) Hydrophobic interaction

25. Which of the following vaccine are products of genetic engineering?

(A) Diphtheria vaccine (B) Hepatitis B vaccine

(C) Influenza vaccine (D) Tetanus vaccine

26. Which of the following is not a method of immobilization?

(A) Adsorption (B) Covalent binding

(C) Hydrogen bonding (D) Entrapment

27. The enzyme complex responsible for symbiotic nitrogen fixation is called :

(A) Hydrogenase
(B) Nitrite reductase
(C) Nitrate reductase
(D) None of the above

28. The most frequently used amino acid in food industry :

(A) Glutamic acid
(B) Lysine
(C) Phenyl alanine
(D) Tryptophan

29. The first cell to recognize that a graft is foreign are the ———————— cells.

(A) B cell
(B) T cell
(C) NK cells
(D) All the above

30. Quellung reaction is used for typing of :

(A) *Klebsiella pneumonia*
(B) *Streptococcus pneumonia*
(C) Both (A) and (B)
(D) None of these

31. Mechanism based enzyme inactivation is also known as :

(A) competitive inhibition
(B) non competitive inhibition
(C) allosteric regulation
(D) suicide inhibition

32. Which of the following genera do not contain species that fix nitrogen symbiotically?

(A) Clostridium
(B) Frankia
(C) Nitrobacter
(D) Anabaena

33. Algal blooms impart a distinct colour to water due to :

(A) their pigments
(B) excretion of coloured substances
(C) formation of coloured chemicals in water facilitated by physiological degradation of algae
(D) absorption of light by algal cell wall

34. Immunocompromised persons are suffered from several fungal diseases. Which of the following is the least frequently associated?

(A) *Cryptococcus neoformans*
(B) *Aspergillus fumigates*
(C) *Malassezia furfur*
(D) *Mucor* species

35. Aspergillosis is recognized in tissue by the presence of :

(A) Coenocytic hyphae
(B) Pseudo hyphae
(C) Septate hyphae
(D) Budding cells

36. A girl who pricked her finger while pruning some rose bushes develops a local pustule that progresses to an ulcer. Several nodules then develop along the local lymphatic drainage. The most likely agent is :

(A) *Aspergillus fumigates*
(B) *Sporothrix schenckii*
(C) *Cryptococcus neoformans*
(D) *Candida albicans*

37. All of the following scientist got Nobel Prize for their contribution in the field of Microbiology EXCEPT :

(A) Louis Pasteur
(B) Elie Metchnikoff
(C) Paul Ehrlich
(D) Robert Koch

38. The organism whose natural habitat is terrestrial and which are able to grow in media without sea water yet able to tolerate varying degrees of salinity are known as :

(A) Indigenous organism
(B) Transient organism
(C) Halotolerant organism
(D) None

39. Spinae are tubular surface appendages in :

(A) Gram positive
(B) Gram negative
(C) Actinomycetes
(D) Archaea bacteria

40. Griseofulvin is a ———————— antibiotic.

(A) Antibacterial
(B) Antifungal
(C) Antitumor
(D) Antiprotozoan

41. Ethanol is one of the most commonly used disinfectants. Which concentration of ethanol is most effective for this purpose?

(A) 100%
(B) 70%
(C) 50%
(D) 95%

42. The proteins produced in plants in the event of a pathogen attack :

(A) AR
(B) SAR
(C) PB
(D) PR

43. Cold agglutinin test is useful for the diagnosis of :

(A) *Mycoplasma pneumonia* (B) *H. influenza*

(C) *N. Menigitidis* (D) *Cryptococcus neoformans*

44. Carl Woese proposed the concept of the domain based on differences in which of the following cellular molecules?

(A) rRNA (B) tRNA

(C) mRNA (D) DNA

45. Which of the following can be the final electron receptor in anaerobic respiration in bacteria?

(A) Oxygen (B) Pyruvate

(C) Nitrate (D) Carbon dioxide

46. Mitochondria are missing in :

(A) Yeast (B) Cyanobacteria

(C) Aspergillus (D) Paramecium

47. Any process that destroys the non-spore-forming contaminants on inanimate objects is :

(A) Antisepsis (B) Sterilization

(C) Disinfection (D) Degermation

48. Fildes technique is used for the culture of :

(A) *Clostridium perfringens* (B) *Clostridium tetani*

(C) *Clostridium botulinum* (D) *Clostridium difficile*

49. A woman with infertility receives an ovary transplant from her sister who is an identical Twin. What type of graft it is?

(A) Xenograft (B) Autograft

(C) Allograft (D) Isograft

50. Type 1 hypersensitivity is mediated by which of the following immunoglobulins?

(A) IgA (B) IgG

(C) IgM (D) IgE

51. The most common pathogens responsible for nosocomial pneumonias in the ICU are :

(A) Gram positive organisms (B) Gram negative organisms

(C) Mycoplasma (D) Virus infections

52. Which dye is most suitable for fungal demonstration in biopsy?

(A) Alizarin red
(B) Veirhoffdye
(C) Masson's trichrome
(D) P.A.S.

53. Which one of the following organisms was not a model organism related to the birth of molecular genetics?

(A) *Streptococcus*
(B) *Penicillium*
(C) *Escherichia*
(D) *Neurospora*

54. The first aminoacid synthesized during protein synthesis :

(A) Tyrosine
(B) Proline
(C) Methionine
(D) Tryptophan

55. The insert capacity of plasmid vectors :

(A) 1 – 15kb
(B) 15 – 25kb
(C) 35 – 45kb
(D) 80 – 100kb

56. The blotting technique used to detect RNA :

(A) Western Blot
(B) Southern Blot
(C) Northern Blot
(D) Eastern Blot

57. The regulation of gene expression in response to fluctuations in cell-population density :

(A) Microbial intelligence
(B) Biofilm
(C) Quorum sensing
(D) Translational regulation

58. Which one is not a DNA staining reagent aiding DNA visualization?

(A) Ethidium bromide
(B) Sybr Green
(C) Hoechst stain
(D) Methyl red

59. The theory behind si-RNA therapy :

(A) Correction of gene mutation with an oligonucleotide
(B) Blocking translation of mRNA from a mutant gene with an oligonucleotide
(C) Providing needed protein synthesized by blood cells
(D) Removal of toxic molecules

60. The enzyme that degrades double stranded DNA :

(A) DNase I
(B) Mung Bean nuclease
(C) S1 nuclease
(D) RNase H

61. Hops are used in the preparation of :

(A) Wine
(B) Ethanol
(C) Citric acid
(D) Beer

62. An organism that has super oxide dismutase and peroxidase but lack catalase is most likely a :

(A) Aerotolerant aerobe
(B) Facultative anaerobe
(C) Obligate anaerobe
(D) Aerotolerant anaerobe

63. Industrial alcohol will be produced by using starter culture :

(A) Top yeast
(B) Middle yeast
(C) Bottom yeast
(D) Feeder yeast

64. 2-aminopurine induces mutation by :

(A) Base pair change
(B) Frame shift
(C) Duplication
(D) Insertion

65. The group which is no longer considered under fungi is :

(A) Ascomycetes
(B) Basidiomycetes
(C) Chytridiomycetes
(D) Oomycetes

66. Name the bacteria known as natural genetic engineer of plants :

(A) *Agrobacterium tumefaciens*
(B) *E. coli*
(C) *Saccharomyces*
(D) *Pseudomonas*

67. The movement of a single cell was required to be continuously monitored during development. This cell was marked with reporter gene. To visualize this movement one would use :

(A) Phase contrast microscope
(B) Bright field microscope
(C) Fluorescence Microscope
(D) Atomic force microscope

68. Major stimulus for spore formation in bacteria is :

(A) Nutrition limitation
(B) Heat stress
(C) Cold stress
(D) pH stress