English

1. Which of the following covalent bond types are found in the structure of ATP?

(A) N-glycosidic, thioester, phosphodiester bond
(B) Phosphoanhydride, phosphomonoester, N-glycosidic bond
(C) Ester, ether, phosphoanhydride bond
(D) Ether, thioester, phosphomonoester bond

Correct Option(s): B

English

2. Which of the following fatty acids has the lowest melting point?

(A) Fatty acids with sites of unsaturation with cis double bonds
(B) Fatty acids with sites of unsaturation with trans double bonds
(C) Fatty acids with no sites of unsaturation
(D) Fatty acids with longer hydrophobic tails

Correct Option(s): A

English

3. Which statement is true of both prokaryotic and eukaryotic cells?

(A) Prokaryotic cells are generally much larger than eukaryotic cells
(B) Eukaryotic cells have ribosomes and prokaryotic cells do not
(C) Both have DNA as their primary genetic material
(D) Eukaryotic cells have plasma membranes and prokaryotic cells do not

Correct Option(s): C

English

4.

A bacterial culture contained 32×10^6 cells after 2.5 hours of exponential growth. If the doubling time was 30 min, what was the initial population size in this culture?

(A) 20×10^4 cells
(B) 10×10^5 cells
(C) 40×10^5 cells
(D) 16×10^6 cells

Correct Option(s): B

English

5. Identify the wrong statement about B-cells

(A) They can present both exogenous and endogenous antigens
(B) They can present only antigens for which they have surface immunoglobulin
(C) They can present only protein antigen
(D) They can present both protein and non-protein antigens

Correct Option(s): C

English

6. Which one of the following is used to study the structural details of biological tissues using freeze-fracture technique?

(A) Scanning electron microscopy
(B) Transmission electron microscopy
(C) Atomic force microscopy
(D) Phase contrast microscopy

Correct Option(s): B

English

7. Which of the following cell organelle(s) are surrounded by a single phospholipid membrane?

(A) Lysosome and Golgi apparatus
(B) Mitochondria and Nucleus
(C) Golgi apparatus and Mitochondria
(D) Outer cell membrane

Correct Option(s): A

English

8. Which one of the following is CORRECT about microbial growth medium?

(A) Sabouraud dextrose agar is a differential medium
(B) Nutrient broth is a defined medium
(C) Trypticase soy agar is a complex medium
(D) Luria-Bertani broth is a synthetic medium

Correct Option(s): C

English

9. Entry of enveloped viruses into their host cells are mediated by

(A) Only endocytosis
(B) Both endocytosis and phagocytosis
(C) Both endocytosis and membrane fusion
(D) Only pinocytosis

Correct Option(s): C

English

10. The second messenger, which opens calcium ion pores in endoplasmic reticulum and plasma membrane is

(A) Diacylglycerol
(B) cAMP
(C) Phosphatidylinositol bisphosphate
(D) Inositol triphosphate

Correct Option(s): D

English

11. The energy -rich fuel molecules produced in the TCA cycle are

(A) 2 GTP, 2 NADH and 1 FADH2
(B) 1 GTP, 2 NADH and 2 FADH2
(C) 1 GTP, 3 NADH and 1 FADH2
(D) 2 GTP and 3 NADH

Correct Option(s): C

English

12. E. coli takes 40 minutes to duplicate its genome using a bidirectional mode of replication. If E. coli were to use unidirectional mode of replication to synthesize a full copy of DNA complementary to just one of the strands of the genome, it would take

(A) 40 minutes
(B) 80 minutes
(C) 20 minutes
(D) 60 minutes

Correct Option(s): B

English

13. If one of the fatty acyl chains is removed from the phosphoglycerides by hydrolysis in solution, such phospholipids will form

(A) Liposomes
(B) Micelles
(C) Phospholipid bilayer
(D) Symmetric phospholipid bilayer

Correct Option(s): B

English

14. Which one of the following reactions takes place during the reduction phase of the Calvin-Benson cycle?

(A) Ribulose 1,5-bisphosphate to 3-phosphate

(B) 1,3-bisphosphoglycerate to glyceraldehydes-3-phosphate

(C) Dihydroxyacetone phosphate to fructose 1,6-bisphosphate

(D) Ribulose 5-phosphate to ribulose 1,5-bisphosphate

Correct Option(s): B

English

15. Which of the following is not an extracellular matrix protein?

(A) Fibronectin

(B) Vitronectin

(C) Laminin

(D) Cyclin

Correct Option(s): D

English

16. E. coli proliferates faster on glucose than it does on lactose because lactose is

(A) Taken up more slowly than glucose

(B) Not hydrolyzed by E. coli

(C) Taken up faster than glucose

(D) Toxic to the cells

Correct Option(s): A

English

17. During protein synthesis in prokaryotes, the peptidyl transferase activity required for peptide bond formation is due to

(A) Ribosomal protein L26

(B) 16S ribosomal RNA

(C) 23S ribosomal RNA

(D) Aminoacyl tRNA

Correct Option(s): C

English

18. A pathogen like Mycobacterium, which colonizes inside the cells of the host, is likely to be least affected by which one of the following host immune defense mechanisms?

(A) Cell-mediated immune response

(B) CD4+ T lymphocytes

(C) Cytokines

(D) Humoral immune response

Correct Option(s): D

English

19.

In bacteria, heat-shock response is primarily controlled by

(A) Sigma S (σ^{s})

(B) Sigma 32 (σ^{32})

(C) Sigma E (σ^{E})

(D) Sigma 70 (σ^{70})

Correct Option(s): B

English

20. Which one of the following viruses cause acute gastrointestinal illness due to contamination of drinking water?

(A) Norovirus
(B) Poliovirus
(C) Rotavirus
(D) Corona virus

Correct Option(s): A

English

21. The term "quorum sensing" refers to:

(A) Bacterial movement toward a chemical stimulus
(B) The process of bacterial spore formation
(C) Cell-to-cell communication in bacteria
(D) The regulation of bacterial gene expression by temperature

Correct Option(s): C

English

22. Which of the following is NOT a mechanism of horizontal gene transfer in bacteria?

(A) Transformation
(B) Transduction
(C) Conjugation
(D) Binary fission

Correct Option(s): D

English

23. In the Ames test, which of the following is tested?

(A) Antibiotic resistance of bacteria
(B) Mutagenicity of a compound
(C) Growth rate of bacteria
(D) Lytic activity of bacteriophages

Correct Option(s): B

English

24. What is the function of the FtsZ protein in bacterial cells?

(A) Flagellar movement
(B) DNA replication
(C) Cell division
(D) Energy production

Correct Option(s): C

English

25. Which of the following microorganisms is an obligate intracellular pathogen?

(A) Escherichia coli
(B) Bacillus subtilis
(C) Chlamydia trachomatis
(D) Staphylococcus aureus

Correct Option(s): C

English

26. The 'competence' of a bacterial cell refers to:

(A) The ability to grow in nutrient-limited conditions
(B) The ability to form biofilms
(C) The ability to take up foreign DNA
(D) The ability to produce antibiotics

Correct Option(s): C

English

27. The primary purpose of Koch's postulates is to:
(A) Isolation of pure cultures of bacteria
(B) Demonstrate the link between a microbe and a disease
(C) Identify the shape of bacterial cells
(D) Analyze bacterial motility
Correct Option(s): B

English

28. The energy required for bacterial flagellar movement is provided by:
(A) ATP
(B) GTP
(C) Proton motive force
(D) NADPH
Correct Option(s): C

English

29. Endotoxins are primarily associated with which bacterial component?
(A) Flagella
(B) Lipopolysaccharides
(C) Peptidoglycan
(D) Ribosomes
Correct Option(s): B

English

30. Which of the following bacteria produce endospores?
(A) Pseudomonas aeruginosa
(B) Escherichia coli
(C) Bacillus anthracis
(D) Neisseria gonorrhoeae
Correct Option(s): C

English

31. A 'temperate phage' is characterized by its ability to:
(A) Lyse the bacterial host immediately after infection
(B) Integrate its genome into the host DNA
(C) Survive extreme environmental conditions
(D) Transfer antibiotic resistance genes
Correct Option(s): B

English

32. The bacterium responsible for the formation of dental plaques is:
(A) Bacillus cereus
(B) Streptococcus mutans
(C) Staphylococcus epidermidis
(D) Pseudomonas fluorescens
Correct Option(s): B

English

33. Which of the following is a characteristic of autotrophic bacteria?
(A) They require organic carbon for growth
(B) They utilize inorganic compounds for energy
(C) They are pathogenic to humans
(D) They rely on light for survival
Correct Option(s): B

English

34. What is the primary mechanism by which antibiotics like penicillin exert their bactericidal effect?

(A) Inhibition of protein synthesis
(B) Disruption of the cytoplasmic membrane
(C) Inhibition of nucleic acid synthesis
(D) Inhibition of cell wall synthesis

Correct Option(s): D

English

35. What is molecular communication in the immune system?

(A) It does not occur
(B) It refers to physical signals like touch
(C) It involves cytokines and receptors
(D) It only occurs in plants

Correct Option(s): C

English

36. Which part of the compound microscope helps gather and focus light rays on the specimen to be viewed?

(A) Condenser lens
(B) Magnifying lens
(C) Objective lens
(D) Eyepiece lens

Correct Option(s): A

English

37. Which among the following is not an ammonia-oxidizing bacteria?

(A) Nitrospina gracilis
(B) Nitrosococcus oceanus
(C) Nitrosomonas europaea
(D) Nitrosovibrio tenuis

Correct Option(s): A

English

38. Acridine orange is which type of mutagen?

(A) chemical compounds
(B) transposons
(C) base analog
(D) intercalating agents

Correct Option(s): D

English

39. The Hybridoma technique was first discovered by,

(A) Kohler and Milstein
(B) Robert Koch
(C) 'D' Herelle
(D) Land Steiner

Correct Option(s): A

English

40. Which of the following vaccines contains an attenuated form of bacteria?

(A) BCG
(B) TAB
(C) Polio
(D) Cholera

Correct Option(s): A

English

41. Immediate type of hypersensitivity reactions are mediated by

(A) T-cells
(B) β-cells
(C) Mast cells
(D) Macrophages

Correct Option(s): B

English

42. What role does the SOS response play in bacterial DNA repair, and how does it impact the genome?

(A) The SOS response facilitates the accurate repair of double-strand breaks, reducing mutation rates.
(B) The SOS response is a last-resort mechanism that allows for error-prone repair of DNA damage, potentially leading to mutations.
(C) The SOS response prevents DNA replication errors by enhancing proofreading mechanisms.
(D) The SOS response decreases the frequency of horizontal gene transfer to minimize genetic variability.

Correct Option(s): B

English

43. Which of the following cocci types of bacteria are majorly found in GI tract?

(A) Streptococcus
(B) Enterococcus
(C) Lactococcus
(D) Staphylococcus

Correct Option(s): B

English

44. Which among the following has undergone reproduction through binary fission?

(A) Mycobacterium tuberculosis
(B) Candida albicans
(C) Volvex
(D) T4 phage

Correct Option(s): A

English

45. How do the mechanisms of oxidative phosphorylation and fermentation differ in their impact on cellular energy yield?

(A) Oxidative phosphorylation produces more ATP per glucose molecule than fermentation by fully oxidizing glucose to CO_2 and H_2O.
(B) Fermentation produces more ATP per glucose molecule than oxidative phosphorylation by bypassing the electron transport chain.
(C) Oxidative phosphorylation and fermentation yield equivalent amounts of ATP per glucose molecule.
(D) Oxidative phosphorylation is less efficient than fermentation due to lower ATP production and greater waste.

Correct Option(s): A

English

46. Which microorganism converts carbohydrates into acetate and lactate?

(A) Arthrobacter
(B) Bifidobacterium
(C) Streptomyces
(D) Micrococcus

Correct Option(s): B

English

47. The recA protein also participates in a type of inducible repair is known as

(A) SOS repair
(B) Recombination repair
(C) Excision repair
(D) Mismatch repair

Correct Option(s): A

English

48. Which of the following dye favours the growth of only gram-negative bacteria?

(A) Basic fuchsin
(B) Methylene blue
(C) Congo red
(D) Safranin

Correct Option(s): A

English

49. Which of the following types of Hepatitis virus transmitted by blood or sexually?

(A) Hepatitis A
(B) Hepatitis B
(C) Hepatitis C
(D) Hepatitis E

Correct Option(s): B

English

50. How does the process of transposon-mediated mutagenesis contribute to bacterial genome plasticity?

(A) Transposons integrate into various locations within the genome, potentially disrupting or altering gene function and promoting genetic diversity.
(B) Transposons enhance the accuracy of DNA replication by providing additional proofreading mechanisms.
(C) Transposons facilitate the exchange of entire chromosomes between bacterial cells, leading to large-scale genomic changes.
(D) Transposons are involved in the repair of single-strand DNA breaks but do not contribute to genetic variation.

Correct Option(s): A