

# 1 Mark Questions

- Which of the following organelles contains DNA, divides and possesses some degree of autonomy?  
(a) Golgi apparatus (b) Ribosome  
(c) Chloroplast (d) Peroxisomes
- Which of the following microorganisms is classified as a member of archaeobacteria?  
(a) Cyanobacteria (b) Methanobacteria  
(c) Trichomonads (d) Mycoplasma
- Archaeal cells usually do not contain peptidoglycan, rather contain pseudo-peptidoglycan which is mainly composed of  
(a) N-acetyl muramic acid and L-amino acids  
(b) N-acetyl talosaminuronic acid and D-amino acids  
(c) N-acetyl muramic acid and D-amino acids  
(d) N-acetyl alosaminuronic acid and L-amino acids
- Some bacteria contain extensive internal membranes that are involved with specific functions. One example of such membranes is chromatophores, which are  
(a) photosynthetic membranes where light is converted to chemical energy in the form of ATP  
(b) convolutions of the inner membrane that extend into the interior of the mitochondrion  
(c) internal membranes where inorganic nitrogen containing compounds oxidise to generate ATP  
(d) interior compartment of chloroplast where fixation of  $\text{CO}_2$  occurs
- In establishing proton gradient for chemiosmotic ATP generation by 'aerobic respiration', the terminal electron acceptor is  
(a) nitrate (b) oxygen  
(c) sulphate (d)  $\text{CO}_2$
- In which of the following splicing events, the intermediates do not form the lariat or the branched structure?  
(a) *Trans* splicing  
(b) Group I intron splicing  
(c) Group II intron splicing  
(d) hnRNA splicing
- Which of the following statements is incorrect for life cycle of bacteriophage  $\text{MS}_2$ ?  
(a) The phage RNA is (+) stranded and it can act as mRNA  
(b) Negative strand RNA is synthesized by the phage encoded RNA replicase  
(c) Ribosomal frameshifting occurs to control the expression of lysis gene  
(d)  $\text{MS}_2$  encoded repressor protein allows this virus to undergo lysis
- Which of the following sets of surface associated microorganisms are populated in the upper respiratory tract (nasal cavity and nasopharynx)?  
(a) *Lactobacillus*, *Escherichia*, *Enterobacter*  
(b) *Streptococcus*, *Staphylococcus*, *Neisseria*  
(c) *Streptococcus*, *Lactobacillus*, *Candida*  
(d) *Klebsiella*, *Staphylococcus*, *Enterobacter*
- Autoimmune diseases result from failure of the immune system to recognise self antigen as self. Following are the sets of autoimmune diseases with the corresponding antigens, which one is the incorrect one?  
(a) Myasthenia gravis N-Platelets  
(b) Rheumatoid arthritis N-Collagen  
(c) Systemic lupus erythematosus N-La nucleoprotein  
(d) Hashimoto thyroiditis N-Thyroglobulin
- The basis for tuberculin test used to detect *Mycobacterium tuberculosis* infection is  
(a) anaphylactic hypersensitivity (type 1)  
(b) antibody dependent cytotoxic hypersensitivity (type 2)  
(c) immune complex mediated hypersensitivity (type 3)  
(d) cell mediated delayed hypersensitivity (type 4)

11. One of the post replication modification in DNA is the methylation of the bases. In this context, which of the following statements is incorrect?  
 (a) Methylation protects cell's own DNA from digestion by its own restriction endonuclease(s)  
 (b) Methylation may result in the localised conversion of B-DNA to Z-DNA  
 (c) Methyl groups are added predominantly to cytosines in bacterial cells and to adenines in eukaryotes  
 (d) Methylation of bases is important in some aspects of DNA repair in bacteria

12. Where in the cells of the eukaryotic organisms are the ribosomes assembled?  
 (a) Nucleolus (b) Cytoplasm  
 (c) Lysosomes (d) Golgi bodies

13. In a mitotically dividing cell, G<sub>2</sub> phase occurs at the  
 (a) beginning of interphase  
 (b) towards the end of interphase  
 (c) just before the DNA synthesis  
 (d) interphase of a mitotically dividing cells is too short to be sub-divided

14. Malt used to ferment beer is prepared by  
 (a) roasting barley  
 (b) washing the barley with water and drying it in air  
 (c) barley is soaked in water, germinated and dried  
 (d) barley is treated with bovine amylase and roasted

15. Which of the following equations is correct for double stranded DNA?  
 (a)  $A + T = G + C$  (b)  $\frac{G}{A} = \frac{T}{C}$   
 (c)  $A + C = G + T$  (d)  $\frac{A}{G} = \frac{C}{T}$

16. There are five classes of the antibodies (IgM, IgD, IgG, IgE, IgA). What determines the class to which an antibody belongs?  
 (a) Structure of the light chain  
 (b) Variable region of the antibody  
 (c) Structure of the heavy chain constant region  
 (d) Stage of the infection

17. Antigen binding sites of an immunoglobulin are located in  
 (a) light chain alone  
 (b) heavy chain alone  
 (c) F<sub>c</sub> region of the antibody  
 (d) F<sub>ab</sub> region of the antibody

18. Pasteurization of milk is done by  
 (a) boiling the milk for 20 minutes  
 (b) heating the milk at 72°C for 30 minutes  
 (c) heating the milk at 72°C for 20 minutes  
 (d) heating the milk at 62°C for 30 minutes

19. The resolving limit of a microscope is defined by which of the following equations?  
 In the equations, 'd' defined the resolving limit, 'λ' is the wavelength of the light source, 'N' is the refractive index of the medium between the lens and object, 'α' is the half angle of the objective lens.  
 (a)  $d = \frac{\lambda}{N \alpha}$  (b)  $d = \frac{\lambda}{N \sin \alpha}$   
 (c)  $d = \frac{0.5\lambda}{N \sin \alpha}$  (d)  $d = \frac{0.5 N}{N \sin \alpha}$

20. Mode of action of rifampicin in *E. coli* is through inhibiting  
 (a) cell division  
 (b) initiation of transcription  
 (c) RNA polymerase binding to DNA template  
 (d) inhibition of the oxidation potential

21. The DNA polymerase responsible for semiconservative replication in *E. coli* is  
 (a) DNA polymerase I  
 (b) DNA polymerase II  
 (c) DNA polymerase III  
 (d) DNA polymerase IV and V

22. Subunit composition of *E. coli* RNA polymerase holoenzyme is  
 (a)  $\alpha\alpha'\beta\beta'\sigma$  (b)  $\alpha\beta\beta'\sigma$   
 (c)  $\alpha\alpha'\beta\sigma$  (d)  $\alpha\beta\gamma$

23. During protein synthesis in *E. coli*, aminoacyl tRNAs are bound to the A-site. Following transpeptidation reaction the peptidyl tRNA is moved to the ribosomal P-site. Factor involved at the translocation step is  
 (a) EF-Ts (b) EF-Tu  
 (c) EF-G (d) EF-1α

24. Shine-Dalgarno sequence found in the prokaryotic mRNAs facilitates ribosome binding by its interaction with the 3' end of the  
 (a) 5 S rRNA (b) 23 S rRNA  
 (c) 16 S rRNA (d) 18 S rRNA

25. Diphtheria toxic  
 (a) acts catalytically  
 (b) releases incomplete polypeptide chains from ribosomes  
 (c) leads to misreading of mRNA  
 (d) cleaves 16 S rRNA into two fragments