

## 1 Mark Questions

- Which of the statements given below on telomerase is incorrect?
  - Telomerase is a ribonucleoprotein
  - Telomerase can be defined as a reverse transcriptase
  - It is an unusual DNA polymerase as it polymerises in 3' to 5' direction
  - It uses an RNA template to extend the ends of the chromosome
- In order for an electron transport chain (ETC) to function
  - each component of the ETC should be capable of reduction by the reduced form of previous component and oxidised by the oxidised form of the downstream component
  - each component of the ETC should be capable of binding oxygen in its active site pocket
  - each component should be capable of regulating the expression of downstream component
  - genes of the components of ETC should be located on the same operon
- Electrode potential of hydrogen under physiological conditions is  $-0.42\text{ V}$ , and that of oxygen is  $+0.82$ . If the free energy change is defined by  $\Delta G'_0 = nF\Delta E'_0$  where  $\Delta G'_0$  is the free energy change at pH 7.0;  $n$  is the number of electrons transferred,  $F$  is the Faraday constant ( $23000\text{ cal/V}$ ), and  $E'_0$  is the difference between the electrode potentials. What will be the free energy change upon reduction of oxygen by hydrogen to  $\text{H}_2\text{O}$ ?
  - $-57050\text{ cal}$
  - $-28520\text{ cal}$
  - $-23000\text{ cal}$
  - $-104080\text{ cal}$
- While facing the minor groove of the right handed double stranded DNA, the left side DNA strand moves up in a
  - 3' to 5' direction
  - 5' to 3' direction
  - could be either 3' to 5' or the 5' to 3' direction
  - minor groove does not provide any idea to the direction of strand polarity
- Several eubacterial mRNAs initiate protein synthesis from GUG codon. The initiating amino acid for the proteins encoded by such mRNAs is
  - Met
  - fMet
  - Val
  - fVal
- Thermus thermophilus* is a
  - Gram negative eubacteria
  - Gram positive eubacteria
  - Gram negative archaeobacteria
  - Gram positive archaeobacteria
- Deletion of a single nucleotide from the open reading frame sequence of a mRNA does not result in the following
  - a shorter polypeptide
  - an extended polypeptide
  - an altered N-terminal domain without affecting the C-terminal domain of the polypeptide
  - an altered C-terminal domain without affecting the N-terminal domain of the polypeptide
- Of the following, which component is not required for protein synthesis in archaeobacteria?
  - Ribosomes
  - mRNA
  - Release factors
  - fMet-tRNA
- A mutant of *E. coli* which expressed *lac* operon constitutively may have a mutation in the following chromosomal locations
  - lac I*
  - lac O*
  - lac I* or *lac O*
  - lac O*



10. What will be the number of antibody specificities in an organism which has 200 V and 5 J genes for the light chain and , 300 V, 10 D and 5 J genes for the heavy chain?  
 (a) 520 (b) 1000  
 (c) 15000000 (d) More than 15000000
11. Which of the following statements is correct?  
 (a) CD<sub>8</sub> binds to an invariant portion of MHC class II molecules  
 (b) CD<sub>8</sub> binds to an invariant portion of MHC class I molecules  
 (c) CD<sub>8</sub> binds directly to the peptide antigen  
 (d) CD<sub>8</sub> binds to the peptide binding site of MHC class I molecules
12. Which of the following disease is caused by DNA viruses?  
 (a) Poliomyelitis (b) Yellow fever  
 (c) Measles (d) Small pox
13. Which of the following disease is not caused by microbial protein toxin?  
 (a) Botulism  
 (b) Diphtheria  
 (c) Shigella dysentery  
 (d) Tuberculosis
14. Coxsackie virus B3, a sub-group of enteroviruses, commonly causes  
 (a) acute haemorrhagic conjunctivitis  
 (b) muscular dystrophy  
 (c) myocarditis  
 (d) gastroenteritis
15. Immunization with which of the following toxoid induces high titre serum antibody, but doesnot protect from corresponding disease?  
 (a) Tetanus (b) Botulism  
 (c) Diphtheria (d) Shigellosis
16. All infections do not cause fever and all fevers are not due to infections: which of the following is an example of non-infectious cause of fever?  
 (a) Typhoid (b) Chicken pox  
 (c) Rheumatic disease (d) Malaria
17. Which of the following is a primary stain in acid fast staining of mycobacteria?  
 (a) Crystal violet  
 (b) Carbol fuchsin  
 (c) Geimsa  
 (d) Methylene blue
18. Antigenic peptides are presented to T-cells by  
 (a) TCR/CD3 (b) CD28  
 (c) CTLA4 (d) MHC
19. The nature of the poliovirus given for oral vaccination (sabin vaccine) as part of the irradiation programme is  
 (a) heat killed viruses  
 (b) live attenuated strains of all three immunological types  
 (c) small dosage of wild-type live viruses  
 (d) formalin-inactivated viruses
20. Which of the following statements on replication in *E. coli* is correct?  
 (a) It occurs in a unidirectional manner  
 (b) It occurs in bi-directional manner  
 (c) Always uses T<sub>7</sub> DNA polymerase when infected by T<sub>7</sub> phage  
 (d) Occurs only when λ phage has infected *E. coli*
21. Retting is a process of biodegradation used for degrading  
 (a) retina from dead animals  
 (b) pectin  
 (c) cellulose  
 (d) starch
22. Prontosil is  
 (a) an effective antibacterial when used in animals  
 (b) as effective antibacterial when used *in vitro* cultures  
 (c) an effective antibacterial both in animals as well as in *in vitro* cultures  
 (d) can not be used as an antibacterial agent
23. Subunit composition of histones in nucleosomes is  
 (a) (H<sub>1</sub>)(H<sub>2</sub>A)(H<sub>2</sub>B)(H<sub>3</sub>)(H<sub>4</sub>)  
 (b) (H<sub>1</sub>)(H<sub>2</sub>A)(H<sub>2</sub>B)(H<sub>3</sub>)(H<sub>4</sub>)<sub>2</sub>  
 (c) H<sub>1</sub>[(H<sub>2</sub>A)(H<sub>2</sub>B)(H<sub>3</sub>)(H<sub>4</sub>)<sub>2</sub>  
 (d) [(H<sub>2</sub>A)(H<sub>2</sub>B)(H<sub>3</sub>)(H<sub>4</sub>)<sub>2</sub>
24. Interval between completion of mitosis and beginning of DNA synthesis is called  
 (a) G<sub>1</sub> phase (b) G<sub>2</sub> phase  
 (c) S phase (d) M phase
25. During the progression of S-phase cdk2 is partnered by  
 (a) cyclin A  
 (b) cyclin D  
 (c) cyclin E  
 (d) transcription factor E2F