QP Code : 50173

Duration 3 Hours

Marks: 100

Marks 40

SECTION I

Instruction: All questions are compulsory.

1) The genome of the E.coli phage (phi) X174 is made up of 11 genes. The E protein encoded by its corresponding gene has the function of _____.

a) Host cell lysis

b) DNA packaging

c) Inhibition of host cell DNA replication

d) Encoding major capsid protein

2) The standard treatment for the control of the pathological conditions caused by_____ is a combination of bismuth subsalicylate, tetracycline and metronidazole for two weeks.

a) Legionella pneumophila

b) Helicobacter pylori

c) VRE

d) MOTT

3) The citrus tristeza virus is transmitted most efficiently by_____.

a) Green citrus aphid

b) Brown citrus mite

c) Brown citrus aphid

d) Green citrus scale pests

4) The TNF – alpha and NO produced by_____ are important in antimicrobial defence, especially in the early hours after infection.

a) NK cells

b) Dendritic cells

c) Kupffer cells

d) NKT cells

5) _____ is a cytoskeletal protein that lines the intracellular side of the plasma membrane in eukaryotic cells.

a) Spectrin

b) Glycophorin

c) Multipass membrane protein

d) Rhodopsin

[TURN OVER

6) GVHD is observed more commonly after allogeneic_____ transplantation and it is a significant cause of morbidity in patients.
   a) Bone marrow
   b) Kidney
   c) Skin
   d) Liver cells

7) The _____ of poxvirus are very important as they contain various enzymes essential for viral replication.
   a) Palisades
   b) Core DNA associated proteins
   c) Core envelope
   d) Lateral bodies

8) Immunological tolerance can be induced by_____.
   a) Phenotypic skewing
   b) Anergy induction
   c) T_{reg} cell generation
   d) All the above methods

9) The cytoskeleton _____ determine the shape of the cells surface and are necessary for whole- cell locomotion; they also drive the pinching of one cell into two.
   a) Microtubules
   b) Actin filaments
   c) Myosin
   d) Molecular motors

10) The pH range over which an enzyme undergoes changes in activity can provide a clue to the type of _____ residue involved.
   a) Positively charged
   b) Negatively charged
   c) amino acid
   d) protein

11) The two components signaling system has a _____protein, a sensor kinase that receives the signal and transmits it to a partner _____ protein

a) Histidine kinase, response regulator

b) Histidine kinase, response inhibitor

c) Phosphofructokinase , response activator

d) Phosphofructokinase , response diverter

12) Satellite viruses and satellite N.A. share which of the following properties_____.

a) Their genetic material is 200 to1500 nucleutides in length

b) Their replication requires the helper virus

c) They may have a dramatic effect on disease symptoms of the plant in most hosts

d) All the above three properties

13) Wiskott- Aldrich Syndrome (WAS) is characterized by a specific defect in cytoskeletal protein resulting in_____

a) Formation of toxic metabolities in T & B cells

b) Defective T cells and platelets

c) Defective C_{40} ligand

d) Defective oxidative burst for phagocytic killing.

14) P element transposons in Drosophila are_____ terminal inverted repeats.

a) 1.9kb long, with 39-bp

b) 1.6kb long, with 31-bp

c) 2.9kb long, with 31-bp

d) 2.9kb long, with 39-bp

15) Which of the following homeotic selector genes of Drosophila does not belong to the antennapedia complex?

a) Labial

b) Deformed

c) Proboscipedia

d) Ultrabithorax

16) A key protein encoded by cpDNA is_____.

a) Ribose- 1, 6-bisphosphate carboxylase-oxygenase

b) Ribulose- 1, 5-bisphosphate carboxylase-oxygenase

c) Ribulose- 1, 6-bisphosphate carboxylase-deoxygenase

d) Ribose- 1, 5-bisphosphate decarboxylase-oxygenase

[TURN OVER

17) The process in which, the coding sequence of an mRNA molecule is altered after transcription and so the protein has an amino acid sequence that differs from that encoded by the gene is called as_____.

a) RNA editing
b) Pre –mRNA processing
c) RNA splicing
d) Micro RNA formation

18) Cystic fibrosis (CF) is caused by a mutation in the gene CFTR, the most common mutation is a deletion of 3 nucleotides that results in a loss of amino acid _____ at 508th position on the protein.

a) Phenylalanine
b) Alanine
c) Glycine
d) Tyrosine

19) The two notable ER-resident chaperons are_____&_____ homologous proteins that participate in facilitating and monitoring the folding and assembly of glycoproteins.

a) Calreticulin & Calnexin
b) Hsp 70 & Hsp 90
c) Neucleoplasmin & Trigger factor
d) Chaperonins & thermosomes

20) The symptom of the viral plant disease in which there is black or grayish brown discoloration of plant cells and tissues is called as_____.

e) Black bark scaling
f) Chlorosis
g) Necrosis
h) Grayish rot

21) Development of vaccine is difficult for AIDS because env gene

a) undergo mutation at rapid rate
b) undergo reverse transcriptase
c) integrate with host genome
d) integrate with helper T cells genome

[TURN OVER

22) _____ is a major advance in the detection of food borne pathogen is the use of standardized pathogen DNA pattern or food born pathogen

a) finger printing

b) plasmid pattern

c) PCR

d) all of the above

23) _____ is the percentage of O2 required by moderate anaerobe

a. 0%

b. < 0.5%

c. 2 – 8%

d. 5 – 10%

24) Vacreation refers to _____

a) vacuum packaging

b) vacuum creation

c) vacuum sterilization

d) vacuum pasteurization

25)_____ is considered a category biological agent?

a) *E .coli* 0157 H7

b) *Cryptosporidious parvum*

c) *Vibrio cholera*

d) *Cl. Botulinum*

26) In STEM, image is produced due to_____

a) electron passing through the specimen

b) reflection from the surface of specimen

c) Scattering of light

d) all of the above

27) The size of nanoparticle is between ----------nm.

a) 100- 1000

b) 0.1-10

c) 1- 100

d) 0.01- 1

28) Cell organelles only found in plant cells are _____

a) Golgi apparatus

b) mitochondria

c) plastids

d) ribosome

29) IPR protect the useof information and ideas that are of

a) ethical value

b) Social value

c) Moral value

d) Commercial value

30) _____ is not correct regarding microbial biofilm

a) quorum sensing molecule signals help in maintening biofilm community

b) Bacterial biofilms are made resistant to effect of antimicrobial agents

c) Plantonic bacteria aggregate to form mushroom like structure

d) Dental plaques are highly polymicrobial

31) Chlorela species are widely used in removal of

a) organic waste

b) hydrocarbon

c) heavy metals

d) all of the above

32) Dissolution of 90 grams of NaOH in 1500 ml of water leads to _____ normality of solution?

a) 1.5 N

b) 1 N

c) 0.5 N

d) 1.35 N

33) _____ category of hypersensitivity BEST describes hemolytic disease of the newborn caused by Rh incompatibility?

a. atopic or anaphylactic

b. cytotoxic

c. immune complex

d. delayed

[TURN OVER

34) Polyomavirus (a DNA virus) causes tumors in "nude mice" but not in normal mice. the BEST interpretation is _____

a. macrophages are required to reject polyomavirus-induced tumors.

b. natural killer cells can reject polyomavirus-induced tumors without help from T lymphocytes.

c. T lymphocytes play an important role in the rejection of polyomavirus-induced tumors.

d. B lymphocytes play no role in rejection of polyomavirus-induced tumors

35) C3a and C5a can cause_____

a. bacterial lysis.

b. vascular permeability.

c. phagocytosis of IgE-coated bacteria.

d. aggregation of C4 and C2.

36) The minor histocompatibility antigens on cells

a. are detected by reaction with antibodies and complement.

b. are controlled by several genes in the major histocompatibility complex.

c. are unimportant in human transplantation.

d. induce reactions that can cumulatively lead to a strong rejection response.

37) . An Rh-negative woman married to a heterozygous Rh-positive man has three children. The probability that all three of their children are Rh-positive is

a. 1:2.

b. 1:4.

c. 1:8.

d. zero.

38) _____ is the best method of reducing the effect of graft-versus-host disease in a bone marrow recipient?

a. matching the complement components of donor and recipient

b. administering alpha interferon

c. removing mature T cells from the graft

d. removing pre-B cells from the graft

39) _____is the odd one

a) gag

b) tat

c) nif

d) rev

40) *Listeria monocytogenes,* pathogen is found in _____

a) undercooked meat

b) soft cheese

c) unpasteurized milk

d) poultry

Section II

Attempt any three questions out of five **30 marks**

1) Write an assay on HIV with reference to its transmission, epidemiology, lifecycle, prevention and diagnosis.
2) Discuss the biotransformation of polycyclic aromatic hydrocarbon with the help of appropriate examples.
3) Calculate the appropriate values and draw the curve for the titration of 500ml of 0.1M weak acid HA, with 0.1M KOH. Ka= 10^{-5} (pKa=5.0)
4) Discuss Data Analysis as an essential feature of Research methodology
5) Discuss GMP in Pharmaceuticals and Cosmetics

Section III

Attempt any two questions out of four **30 marks**

1) Giving an overview of the compartment of the cell and the relationship between them, discuss how proteins are directed to specific organelles and explain how proteins cross organelle membranes.
2) Discuss the various modern diagnostic methods with special reference to advances in molecular and immunological techniques, microarrays and advances in fluorescence technology.
3) Give a detailed account, with the help of appropriate diagrammatic illustrations, wherever applicable, on the steps involved in the E.coli phage T_4 growth cycle.
4) Discuss the significance of Atomic Absorption Spectroscopy with respect to Bimolecular Analysis

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