

MIZORAM PUBLIC SERVICE COMMISSION

TECHNICAL COMPETITIVE EXAMINATIONS FOR RECRUITMENT TO THE POST OF CLINICAL RESEARCH OFFICER UNDER HEALTH & FAMILY WELFARE DEPARTMENT GOVERNMENT OF MIZORAM, AUGUST, 2022

PAPER - III

Time Allowed : 3 hours

Full Marks : 200

All questions carry equal mark of 2 each.

Attempt all questions.

1. Which of the following about active immunity is correct?
 - (a) No Lag phase
 - (b) Booster doses are useful
 - (c) Useful in immunodeficient people
 - (d) No memory cells
2. Superantigens causes
 - (a) Enhancement of phagocytosis
 - (b) Polyclonal activation of B cells
 - (c) Antigen presentation by macrophages
 - (d) Activation of complement
3. Which antibody crosses placenta?
 - (a) IgA
 - (b) IgG
 - (c) IgE
 - (d) IgM
4. Paul Bunnell test is example of
 - (a) Agglutination
 - (b) Precipitation
 - (c) Neutralization
 - (d) CFT
5. All are precipitation reactions except
 - (a) VDRL
 - (b) Kahn test
 - (c) Widal test
 - (d) Ascoli's test
6. Which of the following act as Anaphylotoxin?
 - (a) C3a
 - (b) C3b
 - (c) C4b
 - (d) C2a
7. A positive tuberculin test is an example of
 - (a) Type I Hypersensitivity
 - (b) Type II Hypersensitivity
 - (c) Type III Hypersensitivity
 - (d) Type IV Hypersensitivity
8. Which one of the following cytokine induces fever?
 - (a) IL2
 - (b) IL1
 - (c) IL4
 - (d) IL5
9. Which Antibody mediates type 1 hypersensitivity reaction
 - (a) IgA
 - (b) IgG
 - (c) IgE
 - (d) IgM
10. Which Antibody is elevated in acute infection?
 - (a) IgA
 - (b) IgG
 - (c) IgE
 - (d) IgM

11. Which Antibody mediates mucosal immunity?
 - (a) IgA
 - (b) IgG
 - (c) IgE
 - (d) IgM
12. Prozone phenomenon is due to
 - (a) Excess antigen
 - (b) Excess antibody
 - (c) Hyperimmune reaction
 - (d) Both antigen & antibody excess
13. All the following are antigen presenting cells except
 - (a) T cells
 - (b) B cells
 - (c) Dendritic cells
 - (d) Macrophage
14. All the following are vaccines given at birth except
 - (a) BCG
 - (b) Hepatitis B
 - (c) DPT
 - (d) OPV
15. All the following are live attenuated vaccines except
 - (a) MMR
 - (b) Yellow Fever
 - (c) Salk polio
 - (d) Sabin polio
16. Grafts placed in anatomically abnormal sites are called as
 - (a) Orthotropic grafts
 - (b) Heterotropic grafts
 - (c) Vital grafts
 - (d) Static grafts
17. Autoimmunity can be caused due to all of the following except
 - (a) The pressure of forbidden clones
 - (b) Expression of cryptic antigens
 - (c) Negative selection of T cells in the thymus
 - (d) Release of sequestered antigens
18. Cell type which lacks HLA Antigen is
 - (a) Monocytes
 - (b) Thrombocytes
 - (c) Neutrophil
 - (d) Red blood cells
19. Endotoxin acts by
 - (a) Classical pathway
 - (b) Lectin pathway
 - (c) Alternative pathway
 - (d) Both (a) & (b)
20. Overall immunity of a community towards a pathogen is called as
 - (a) Local immunity
 - (b) Herd immunity
 - (c) Adoptive immunity
 - (d) Adaptive immunity
21. A cell without a cell wall is termed as
 - (a) Tonoplast
 - (b) Protoplast
 - (c) Symplast
 - (d) Apoplast
22. The oxygen and carbon dioxide crosses the plasma membrane by the process of
 - (a) Active diffusion
 - (b) Facilitated diffusion
 - (c) Passive diffusion
 - (d) Random diffusion
23. Which of the following cell organelle is involved in the breakdown of organic matter
 - (a) Lysosomes
 - (b) Cytoplasm
 - (c) Golgi bodies
 - (d) Mitochondria
24. Which of the following is involved in the storage of food, other nutrients, required for a cell to survive
 - (a) Vacuoles
 - (b) Lysosome
 - (c) Mitochondria
 - (d) Cell membrane

25. Which of the following is responsible for transporting, modifying and packaging proteins and lipids
(a) Mitochondria (b) Endoplasmic reticulum
(c) Golgi Complex (d) DNA
26. RNA is present in which of the following cell organelle
(a) Cell wall (b) Ribosome
(c) Nucleus (d) Cell membrane
27. Which of the following cells release insulin when glucose levels elevate in the body
(a) Gamma cells (b) Beta cells
(c) Alpha cells (d) Zeta cella
28. Sodium and Potassium pumps are examples of
(a) Plasmolysis (b) Active transport
(c) Passive transport (d) Osmosis
29. Gap junctions are absent in which type of cells
(a) Sperm cells (b) Brain cells
(c) Reproductive cells (d) Cardiac cells
30. Which of the following are phagocytic cells
(a) Neutrophils, mast cells (b) Mast cells, macrophages
(c) Mast cells, antibodies (d) Neutrophils, macrophages
31. Which of the following is known as powerhouse of the cell?
(a) Mitochondria (b) Cytoplasm
(c) Lysosome (d) Nuclei
32. Which of the following is known as suicide bag of a cell?
(a) Mitochondria (b) Golgi complex
(c) Lysosome (d) Nuclei
33. Which part of a neuron receives information from other neurons?
(a) Cell body (b) Axon
(c) Dendrites (d) Myelin sheath
34. DNA is stored in which of the following cell organelle?
(a) Cell wall (b) Cell membrane
(c) Nucleus (d) Cytoplasm
35. Which of the following doesn't have a cell?
(a) Virus (b) Bacteria
(c) Fungi (d) Algae
36. Acid fastness of *M. tuberculosis* is due to
(a) Peptidoglycan layer (b) Arabinoglycan layer
(c) Mycolic acid layer (d) Lipoarabinomannan
37. Elephantiasis is caused by
(a) *Wucherei bancrofti* (b) *Ascaris limbricoides*
(c) *Enterobius vermicularis* (d) *Fasciola hepatica*
38. Which of the following site is most commonly affected by *C. diphtheria*
(a) Skin (b) Conjunctiva
(c) Faucial (d) Kidney

39. Plaque is transmitted by
(a) Rat flea (b) Soft tick
(c) Hard tick (d) Louse
40. The causative agent of Syphilis is
(a) Entamoeba histolytica (b) Neisseria gonorrhoea
(c) Plasmodium (d) Treponema pallidum
41. Hand-foot-and -mouth disease is caused by
(a) HSV (b) Coxsackie virus
(c) Measles (d) Chicken pox
42. A Tzank smear of a scrapping obtained from a vesicle on the skin demonstrates multinucleate giant cells. Which of the following is associated with such findings
(a) HSV-1 (b) Variola major
(c) Coxackie virus (d) Molluscum contagiosa
43. The correct sequence of manifestation seen in measles is
(a) Fever - Koplik's spot- rash (b) Koplik's spot - fever - rash
(c) Rash - fever - Koplok's spot (d) Rush - Koplik's spot - fever
44. During window period of patient with AIDS, best diagnostic test is
(a) ELISA (b) Western blot
(c) Rapid test (d) RT-PCR
45. What does '19' in Covid - 19 refer to
(a) There are 19 variants of the coronavirus
(b) There are 19 symptoms of coronavirus disease
(c) This is the 19 coronavirus pandemic
(d) The coronavirus and disease were identified in 2019
46. Most common fungus causing secondary infection in severe Covid-19 patients
(a) Mucor (b) Apergillilus
(c) Candida (d) Cryptococcus
47. What is the infective form of malaria parasite
(a) Oocyst (b) Sporozoite
(c) Bradtzoite (d) Tachyzoite
48. Germ tube test is a diagnostic test for
(a) Candida glabrata (b) Candida albicans
(c) Cryptococcus neoformans (d) Coccidioidesimmitis
49. All of the following are oncogenic RNA viruses except
(a) HTLV I (b) HIV
(c) Hepatitis B (d) Hepatitis C
50. Best indicator of HIV prognosis
(a) CD4T cell count (b) CD8 T cell count
(c) HIV RNA (d) ELISA
51. All of the following are transmitted by respiratory route except
(a) Influenza virus (b) SARSCoV2 virus
(c) Respiratory Syncytial virus (d) Rotavirus

52. Scalded skin syndrome toxin is released by
(a) *Streptococcus pyogenes* (b) *Staphylococcus aureus*
(c) *Enterococcus faecalis* (d) *Corynebacterium diphtheria*
53. *Mycobacterium tuberculosis* complex includes all except
(a) *M. tuberculosis* (b) *M. bovis*
(c) *M. leprae* (d) *M. caprae*
54. Common name of *Trichuris trichiura* is
(a) Pinworm (b) Roundworm
(c) Hook worm (d) Whipworm
55. Scrub typhus is caused by
(a) *R. prowazekii* (b) *R. typhi*
(c) *O. tsutsugamushi* (d) *Coxiella burnetii*
56. Who is known as Father of Genetics
(a) Morgan (b) Mendel
(c) Watson (d) Bateson
57. Cystic fibrosis is
(a) Sex-linked recessive disorder (b) Autosomal dominant disorder
(c) Autosomal recessive disorder (d) Sex-linked dominant disorder
58. Homozygosity and heterozygosity of an individual can be determined by
(a) Back cross (b) Self-fertilisation
(c) Test cross (d) All cross
59. The alternate form of a gene
(a) Alternate type (b) Recessive character
(c) Dominant character (d) Allele
60. Which of the following repeated sequences includes an open reading frame for reverse transcriptase
(a) LINE (b) SINE
(c) Segmental duplication (d) DNA transposon
61. DNA helices enzyme involved in base excision repair mechanism is
(a) DNA helicase I (b) DNA helicase II
(c) DNA helicase III (d) DNA helicase IV
62. In humans, each cell normally contains _____ of chromosomes
(a) 11 pairs (b) 23 pairs
(c) 32 pairs (d) 46 pairs
63. In a family, father is having a disease and mother is normal. The disease is inherited to only daughters and not to sons. What type of disease is this
(a) Sex linked dominant (b) Sex linked recessive
(c) Autosomal dominant (d) Autosomal recessive
64. Which of the following is not a type of chromosomal aberration?
(a) Duplication (b) Translocation
(c) Mutations (d) Inversion

65. A woman with one gene for haemophilia and one gene for colour blindness marries a normal man. How will the progeny be
- (a) Haemophilic and colour blind daughters
 - (b) All sons and daughters are haemophilic and colour blind
 - (c) 50% haemophilic and colour blind sons and 50% normal sons
 - (d) 50% haemophilic and colour blind sons and 50% colour blind daughters
66. Haemophilia is more common in males because it is a
- (a) Recessive character carried by Y -chromosome
 - (b) Dominant character carried by Y - chromosome
 - (c) Dominant trait carried by X- chromosome
 - (d) Recessive trait carried by X - chromosome
67. The DNA structure was investigated in the year
- (a) 1943
 - (b) 1953
 - (c) 1963
 - (d) 1973
68. The helical nature of DNA was revealed by the work of?
- (a) Linus Pauling
 - (b) Rosalind Franklin
 - (c) Maurice Wilkins
 - (d) Louis Pasteur
69. Translation is a process of
- (a) mRNA synthesis
 - (b) tRNA synthesis
 - (c) Protein synthesis
 - (d) Nucleic acid synthesis
70. Proto-oncogenes are possessed by the
- (a) RNA virus
 - (b) DNA virus
 - (c) Cells Themselves
 - (d) Pathogenic bacteria
71. Polymerase Chain reaction (PCR) was invented by
- (a) Kary Mulis
 - (b) James Watson
 - (c) John Hopkins
 - (d) Hargobind Khorana
72. Tag polymerase is a
- (a) Heat-stable
 - (b) Buffering
 - (c) Denaturant
 - (d) Large
73. The temperature cycles in a polymerase chain reaction are in the order
- (a) 95p ,60p , 72p
 - (b) 60p ,72p , 95p
 - (c) 72p , 60p 95p
 - (d) 95p , 72p 60p
74. Which of the following is used to precipitate the nucleic acids?
- (a) Glycerol
 - (b) Ethanol
 - (c) Methanol
 - (d) Ethylene
75. Which type of gel is used for large nucleic acids?
- (a) Acrylamide
 - (b) Cellulose
 - (c) Agarose
 - (d) Sephadex
76. Which technique is used to separate nucleic acids of size greater than 25 kb?
- (a) SDS-PAGE
 - (b) Pulsed –field electrophoresis
 - (c) 2D-gel electrophoresis
 - (d) Isoelectric focusing

77. The procedure by which DNA gel is transferred to a membrane is termed as
(a) Blotting (b) Centrifugation
(c) Electrophoresis (d) Paper chromatography
78. Which of the following can be analyzed using a Northern blot?
(a) RNA (b) Carbohydrates
(c) Proteins (d) DNA
79. Which enzyme is used in the unwinding of DNA
(a) Ligase (b) Topoisomerase
(c) Helicase (d) Exonuclease
80. What is resolution
(a) Exchange of DNA fragments (b) Heterochromatin structure formation
(c) Regeneration of duplex DNA molecule (d) Cleavage of holiday junction
81. Which of the following does not take part in gene expression
(a) Transcription (b) RNA processing
(c) Replication (d) Translation
82. Which of the following will form a palindromic sequence
(a) AGTCCTGA (b) GTTCCAAG
(c) ATTGCAAT (d) GTTGGAAC
83. DNA synthesis can be measured by estimating the incorporation of radio labelled
(a) Thymine (b) Guanine
(c) Cytosine (d) Adenine
84. In eukaryotes, the mismatch repair mechanism is initiated and directed by
(a) Methylated DNA strand (b) Acetylated DNA strand
(c) Strand specific nicks (d) Double stranded breaks
85. Which of the following processes does not occur in prokaryotes
(a) Transcription (b) Splicing
(c) Translation (d) Replication
86. Which of the following databases can be used to access text information about human diseases?
(a) EST (b) PBD
(c) OMIM (d) HTGS
87. An example of homology & similarity tool
(a) PROSPECT (b) EMBOSS
(c) RASMOL (d) BLAST
88. Which of the following amino acid is least mutable according to PAM scoring matrix
(a) Alanine (b) Glutamine
(c) Methionine (d) Cysteine
89. You have a reasonably short , typical , double stranded DNA sequence . Basically , how many proteins can it potentially encode
(a) 1 (b) 2
(c) 3 (d) 6

90. Normalised BLAST scores (also called bit scores)
- (a) Are unitless
 - (b) Are not related to the scoring matrix that is used
 - (c) Can be compared between different BLAST searches, even if different scoring matrices are used
 - (d) Can be compared between different BLAST searches, but only if the same scoring matrices are used
91. A PSI-BLAST search is most useful when you want to do the following
- (a) Find the rat ortholog of a human protein
 - (b) Extend a database search to find additional proteins
 - (c) Extend a database search to find additional DNA sequences
 - (d) Use a pattern or signature to extend a protein search
92. Which of the following BLAST programs uses a signature of amino acids to find proteins within a family?
- (a) PSI-BLAST
 - (b) PHI-BLAST
 - (c) MS BLAST
 - (d) WormBLAST
93. An example of of an operational taxonomic unit (OTU) is
- (a) Multiple sequence alignment
 - (b) Protein sequence
 - (c) Clade
 - (d) Node
94. Deposition of cDNA into inert structure is
- (a) DNA fingerprinting
 - (b) DNA polymerase
 - (c) DNA probes
 - (d) DNA microarray
95. Analysing or comparing entire genome of species
- (a) Bioinformatics
 - (b) Genomics
 - (c) Proteomics
 - (d) Pharmacogenomics
96. Characterizing molecular component is
- (a) Genomics
 - (b) Cheminformatics
 - (c) Proteomics
 - (d) Bioinformatics
97. Most commonly used measure of central tendency is
- (a) Mode
 - (b) Median
 - (c) Mean
 - (d) Range
98. Difference between the minimum value and the maximum value of the observations
- (a) Variance
 - (b) Interquartile range
 - (c) Range
 - (d) Standard deviation
99. The following measure is not influenced by extreme values in a data set
- (a) Arithmetic mean
 - (b) Interquartile range
 - (c) Range
 - (d) Interquartile and range
100. When the data set contains too many extreme values, the most representative average value is
- (a) Mode
 - (b) Median
 - (c) Mean
 - (d) Variance