

Note: Answer all the flowing

Q1 : Choose the correct answer : (150 M) .

Bacteriology:

1. The main pathogenic *Clostridium* species causing gas gangrene is:
A) *C. difficile* B) *C. tetani* C) *C. perfringens* D) *C. botulinum*
2. *Listeria monocytogenes* is:
A) Gram-negative rod B) Gram-positive rod
C) Gram-positive cocci D) Gram-negative cocci
3. The preferred environment for *Pseudomonas aeruginosa* is:
A) Dry surfaces B) Moist environments C) Sunlight D) High salt
4. Human brucellosis is also called:
A) Malta fever B) Scarlet fever C) Q fever D) Typhus
5. *Salmonella typhi* can be diagnosed by:
A) Blood culture (first week) B) Stool culture (second week)
C) Widal test (after first week) D) All of the above
6. The major virulence factor of *C. tetani* is:
A) Tetanolysin B) Tetanospasmin C) Exotoxin A D) Neurotoxin B
7. *Listeria* is catalase:
A) Positive B) Negative C) Variable D) None
8. *P. aeruginosa* is naturally:
A) Non-pathogenic B) Opportunistic pathogen C) Acid-fast D) Spore-forming
9. The vaccine for brucellosis is:
A) Not available for humans B) Available for animals
C) Both A and B D) Only for pregnant women
10. The most common source of non-typhoidal salmonellosis is:
A) Poultry, eggs B) Vegetables C) Cattle D) Soil

11.The classic symptom of typhoid fever is:

- A) High, step-ladder fever B) Jaundice C) Rash D) Vomiting

12.The incubation period for brucellosis is:

- A) 1-2 days B) 1-3 weeks C) 1-3 months D) 1 year

13.Brucella is best grown on:

- A) Blood agar B) Chocolate agar C) Castaneda's medium D) EMB agar

14.*P. aeruginosa* is best visualized by:

- A) Gram stain B) Ziehl-Neelsen stain C) Albert's stain D) Wright's stain

15.*P. aeruginosa* is naturally resistant to many antibiotics due to:

- A) Capsule B) Efflux pumps and low permeability
C) Beta-lactamase D) Spore formation

16.*Listeria* can cross:

- A) Blood-brain barrier B) Placenta C) Both A and B D) Neither

17.*Listeria* is transmitted mainly through:

- A) Airborne droplets B) Contaminated food
C) Blood transfusion D) Insect bites

18. Which is NOT a feature of *Clostridium*?

- A) Gram-positive B) Spore-forming C) Anaerobic D) Acid-fast

19. Which *Clostridium* is a common cause of wound infections after trauma?

- A) *C. difficile* B) *C. perfringens* C) *C. botulinum* D) *C. tetani*

20. *C. perfringens* alpha toxin has:

- A) Lecithinase activity B) Coagulase activity C) Streptokinase activity D) None

21.*Listeria* infections are most severe in:

- A) Young, healthy adults B) Immunocompromised and pregnant women
C) Teenagers D) Athletes

22.The classic symptom of brucellosis is:

- A) Jaundice B) Undulating (intermittent) fever C) Rash D) Cough

23.Which vaccine is available for typhoid prevention?

- A) Live attenuated oral B) Killed injectable C) Both A and B D) No vaccine

24.The carrier state in typhoid fever is mainly in:

- A) Gallbladder B) Lungs C) Intestine D) Blood

25.The best initial test for typhoid diagnosis in the first week is:

- A) Stool culture B) Blood culture C) Urine culture D) PCR

26.Listeria produces:

- A) Beta-hemolysis B) Alpha-hemolysis
C) Gamma-hemolysis D) No hemolysis

27. The best method for laboratory diagnosis of Listeria is:

- A) Culture and motility testing B) Serology C) PCR only D) Gram stain only

28. C. difficile is commonly associated with:

- A) Urinary tract infections B) Respiratory infections
C) Pseudomembranous colitis D) Endocarditis

29. Which Clostridium species is non-motile?

- A) *C. botulinum* B) *C. perfringens* C) *C. tetani* D) *C. difficile*

30. The classic presentation of listeriosis in newborns is:

- A) Otitis media B) Skin rash C) Bronchitis D) Meningitis

Bacterial physiology:

31.All microorganisms require several nutrients in small amounts called micronutrients (trace elements). Which of the followings is considered as microelements:

- A) Hydrogen. B) Nitrogen. C) Phosphorus. D) Manganese

32.The microorganisms which used reduced, preformed, organic molecules from other organisms are called:

- A) Autotrophs. B) Phototrophs. C) Heterotrophs. D) Chemotrophs.

33.The generation time of a bacterial culture is 45 minutes. How many bacteria will be present after 6 hours if the initial inoculum was 1,000 cells?

- A) 32,000 B) 64,000 C) 128,000 D) 256,000

34.Which of the following environmental factors would have the LEAST direct effect on microbial growth rate?

- A) Water activity B) pH C) Barometric pressure D) Temperature

35.Which transport mechanism requires metabolic energy and results in chemical modification of the transported molecule?

- A) Facilitated diffusion B) ABC transporter active transport
C) Group translocation D) Simple diffusion

36.Which enzyme is responsible for breaking down hydrogen peroxide in aerobic bacteria?

- A) Superoxide dismutase B) Oxidase C) Peroxidase D) Catalase

37.Which vitamin is required as a coenzyme for carboxylation reactions and is involved in fatty acid synthesis?

- A) Biotin B) Thiamine C) Riboflavin D) Niacin

38.In the electron transport chain, the P/O ratio refers to:

- A) Number of protons pumped per oxygen atom reduced
B) Number of ATP molecules produced per atom of oxygen reduced
C) Ratio of phosphate to oxygen in ATP
D) Rate of oxygen consumption per phosphate group transferred

39.All of the following are true about archaeal membranes EXCEPT:

- A) They contain ether-linked lipids
B) They may form lipid monolayers
C) They contain fatty acids with ester linkages
D) They may contain tetraether lipids

40. Which of the following describes an oligotrophic environment?

- A) High nutrient concentration
- B) Low nutrient concentration
- C) High oxygen concentration
- D) Low temperature

41. In the absence of oxygen, which of the following can serve as a terminal electron acceptor for anaerobic respiration?

- A) NAD^+
- B) FAD
- C) Nitrate (NO_3^-)
- D) Water

42. Which statement about siderophores is TRUE?

- A) They are produced only by pathogenic bacteria
- B) They are always located on the bacterial cell surface
- C) They bind ferric iron with high affinity
- D) They require ATP for iron release after uptake

43. The process of forming a cross wall between two daughter cells called:

- A) Septation
- B) Separation.
- C) Coss-linking
- D) Division.

44. The ABC transporter system in bacteria requires all of the following EXCEPT:

- A) ATP-binding domains
- B) Membrane-spanning domains
- C) A periplasmic substrate-binding protein (in gram-negative bacteria)
- D) A proton gradient across the membrane

45. Which statement about the bacterial cell cycle is TRUE?

- A) The Z ring forms at mid-cell and is composed of MreB protein
- B) The MinCD system promotes Z ring formation at the poles
- C) Chromosome segregation is a passive process requiring no energy
- D) FtsZ is a tubulin homolog that polymerizes to form the Z ring

46. In rapidly growing E. coli with a doubling time of 20 minutes, DNA replication:

- A) Occurs only once per cell cycle
- B) Takes 40 minutes, so multiple replication rounds occur simultaneously
- C) Occurs after cell division is complete
- D) Initiates at multiple origins simultaneously

- 47. Which of the following is TRUE about programmed cell death in bacterial populations?**
- A) All bacteria in a starving population undergo programmed cell death
 - B) Programmed cell death is altruistic, releasing nutrients for surviving cells
 - C) Programmed cell death is identical to the VBNC state
 - D) Only gram-positive bacteria can undergo programmed cell death
- 48. In active transport via ABC transporters, energy is provided by:**
- A) Proton motive force
 - B) ATP hydrolysis
 - C) Sodium gradient
 - D) PEP
- 49. Which of the following experimental approaches would BEST distinguish between passive diffusion and facilitated diffusion of a solute across the bacterial plasma membrane?**
- A) Measure transport rate at different external solute concentrations and look for saturation kinetics
 - B) Measure transport rate at different temperatures and calculate activation energy
 - C) Measure intracellular accumulation against a concentration gradient
 - D) Measure transport rate before and after addition of a proton ionophore
- 50. An obligate anaerobe that lacks superoxide dismutase and catalase is exposed to air for 30 minutes. Subsequent plating shows 0.01% survival. If the same experiment is performed in the presence of 10 mM $MnCl_2$, survival increases to 15%. This suggests that:**
- A) Mn^{2+} induces expression of superoxide dismutase in this organism
 - B) Mn^{2+} prevents oxygen from entering the cell by binding to porins
 - C) Mn^{2+} activates a cryptic catalase that is normally inactive
 - D) Mn^{2+} can chemically scavenge superoxide radicals in the absence of SOD

Immunology:

- 51. An animal receives immune serum after possible exposure to tetanus. The expected protection is mainly due to:**
- A) early activation of naive B cells
 - B) transfer of preformed antibodies
 - C) gradual induction of memory T cells
 - D) stimulation of germinal-center reactions

52.A killed vaccine fails to induce a strong response unless formulated with an additional immune-stimulating component. This is most likely because killed vaccines:

- A) May provide limited innate stimulation alone
- B) usually replicate poorly but persist in tissues
- C) induce protection without antigen processing
- D) mainly stimulate memory cells before priming

53.A live attenuated vaccine often induces strong immunity because it:

- A) provides only circulating antibodies
- B) exposes the host to antigen in a natural-like pattern
- C) avoids interaction with antigen-presenting cells
- D) prevents local innate immune activation

54.A major safety concern with live attenuated vaccines is their possible use in animals that are:

- A) fully immunocompetent
- B) previously vaccinated
- C) exposed to low antigen doses
- D) immunosuppressed

55.A vaccinated herd develops disease after exposure to a field strain antigenically different from the vaccine strain. The most likely explanation is:

- A) excessive booster response
- B) incomplete antigenic matching
- C) improved antibody affinity
- D) absence of pathogen exposure

56. A mediator released by an activated T cell enhances the activity of the same cell that produced it. This pattern is best described as:

- A) paracrine signaling
- B) endocrine-like signaling
- C) autocrine signaling
- D) systemic regulation

57. A macrophage-derived cytokine activates nearby leukocytes within inflamed tissue. This interaction most closely represents:

- A) systemic endocrine action
- B) passive antibody transfer
- C) paracrine communication
- D) intracellular digestion

58.A mediator that strongly recruits leukocytes along a concentration gradient is best classified functionally as a:

- A) chemokine B) colony-stimulating factor C) type I interferon D) regulatory antibody

59.A cytokine that promotes eosinophil-associated responses in helminth infection or allergic inflammation is most likely:

- A) IL-10 B) IFN-gamma C) IL-12 D) IL-5

60. A cytokine that suppresses macrophage activation and reduces inflammatory cytokine production is most consistent with:

- A) TNF-alpha B) IL-10 C) IL-12 D) CXCL8

61. During antigen presentation, different cytokine profiles may shift CD4+ T-cell responses toward Th1-, Th2-, or regulatory-type patterns. This mainly illustrates cytokine influence on:

- A) effector pathway selection B) antigen uptake efficiency
C) complement deposition D) antibody Fc binding

62.During the earliest vascular phase of inflammation, rapid vasodilation and increased vascular permeability are most closely linked to release of:

- A) pentraxins B) histamine C) defensins D) lysozyme

63.A tissue mediator that produces pain, vasodilation, and increased vascular permeability after activation of plasma proteolytic systems is most consistent with:

- A) C-reactive protein B) lactoferrin C) bradykinin D) thromboplastin

64.During acute inflammation, a cytokine promotes hepatic acute-phase protein production and supports B-cell differentiation. This mediator is most likely:

- A) IFN-gamma B) IL-6 C) CXCL8 D) IL-4

65.An acute-phase protein that binds microbial surfaces and promotes innate recognition is most consistent with:

- A) perforin B) interleukin-5 C) histamine D) C-reactive protein

66. Pentraxins are important in humoral innate immunity because they mainly:

- A) act as soluble pattern-recognition molecules
- B) function as cytotoxic T-cell receptors
- C) replace complement proteins completely
- D) induce antibody affinity maturation

67. The coagulation system contributes to innate defense partly by:

- A) preventing all leukocyte migration
- B) producing antigen-specific antibodies
- C) suppressing inflammatory mediator release
- D) trapping microbes within fibrin networks

68. Antimicrobial peptides such as defensins and cathelicidins are effective because they can:

- A) suppress antigen presentation only
- B) disrupt microbial membranes
- C) induce passive immunity
- D) block all vascular responses

69. The sequence of phagocytosis is most accurately represented by:

- A) antigen presentation, class switching, antibody secretion
- B) recognition, engulfment, phagosome formation, intracellular killing
- C) cytokine release, B-cell activation, memory formation
- D) complement fixation, IgA transport, plasma-cell maturation

70. A bacterium coated with antibody is more efficiently phagocytosed because phagocytes recognize the antibody through:

- A) Fc receptors
- B) MHC class I molecules
- C) T-cell receptors
- D) histamine receptors

71. A bacterium coated with C3b is recognized by phagocytes mainly through:

- A) cytokine receptors
- B) complement receptors
- C) B-cell receptors
- D) hormone receptors

72. A rapid increase in oxygen consumption after neutrophil activation indicates initiation of:

- A) clonal expansion
- B) somatic hypermutation
- C) respiratory burst
- D) class switching

73. Classical M1 macrophage activation is most closely associated with:

- A) tissue repair and reduced microbial killing
- B) passive antibody transfer
- C) inflammatory defense and reactive nitrogen species production
- D) eosinophil-mediated allergy only

74. Natural killer cells are most relevant when innate defense requires:

- A) antibody class switching
- B) destruction of virus-infected or abnormal cells
- C) production of mucosal IgA
- D) formation of germinal centers

75. Inflammasome activation is mainly linked to production of:

- A) IgE and IgA
- B) IL-1 beta and inflammatory signaling
- C) albumin and fibrinogen only
- D) antigen-specific receptors

76. An exogenous antigen taken up by an antigen-presenting cell is most commonly presented to CD4+ helper T cells through:

- A) MHC class I
- B) MHC class II
- C) secretory IgA
- D) complement C9

77. Endogenous antigens from virus-infected cells are most relevant to activation of:

- A) CD8+ cytotoxic T cells
- B) eosinophil degranulation
- C) B-cell class switching only
- D) mast-cell histamine release

78. Germinal centers are important during adaptive immune responses because they support:

- A) random neutrophil activation
- B) B-cell selection and affinity maturation
- C) direct complement lysis only
- D) loss of antigen specificity

79. Protection should not be judged only by antibody titer because effective immunity may also involve:

- A) loss of all lymphocyte memory
- B) cellular and mucosal mechanisms
- C) absence of antigen specificity
- D) complete inhibition of inflammation

80. An animal exposed to the same antigen for a second time develops a faster and more intense response. This is best explained by:

- A) increased participation of antigen-experienced lymphocyte populations
- B) complete replacement of adaptive immunity by innate mechanisms
- C) reduced affinity of antigen-binding receptors after priming
- D) delayed expansion of antigen-specific lymphocytes

Virology:

81. Host specificity and tissue tropism of a virus are primarily determined by:

- A) Presence of appropriate cellular receptors
- B) Temperature of the host
- C) Size of the virus
- D) Viral lipid content

82. Arboviruses are defined as:

- A) Viruses transmitted by animal bites
- B) Viruses that replicate in arthropod vectors and are transmitted by them
- C) All insect-borne viruses
- D) Viruses of arthropods only

83. What is a cytotoxic viral infection?

- A) An infection where virus replicates without killing the cell
- B) An infection that causes cell transformation
- C) An infection that persists for life
- D) An infection that kills the host cell

84. In latent viral infections:

- A) Infectious virions are continuously produced
- B) The virus is always integrated into host DNA
- C) Infectious virions are not formed
- D) Cell death always occurs

85. Which mechanism is NOT involved in virus-induced cell injury?

- A) Inhibition of host-cell nucleic acid synthesis
- B) Inhibition of host-cell protein synthesis
- C) Enhancement of host-cell DNA repair
- D) Interference with cellular membrane function

86. The "Trojan Horse" mechanism of viral spread involves:

- A) Viruses carried inside monocytes/macrophages
- B) Viruses hiding in arthropod vectors
- C) Viruses entering through the placenta
- D) Viruses transported in nerve axons

87. Which virus family is known for cell-associated viremia with lymphocytes?

- A) Flaviviridae B) Picornaviridae C) Parvoviridae D) Retroviridae

88. Rabies virus travels to the central nervous system by:

- A) Hematogenous spread B) Neural spread in axon cytoplasm
- C) Lymphatic spread D) Direct invasion

89. Which of the following is NOT a site of virus shedding?

- A) Respiratory tract B) Gastrointestinal tract
- C) Skin D) Bone marrow

90. Which virus is shed in semen for months or years?

- A) Equine arteritis virus B) Rabies virus C) Influenza virus D) Rotavirus

91. The term "dead-end host" refers to:

- A) A host that dies from the infection
- B) A host from which virus is not transmitted to others
- C) A host that cannot be infected
- D) A host that clears the infection

92. Which virus uses heavily glycosylated surface glycoproteins to mask neutralizing epitopes?

- A) Influenza virus B) Enterovirus C) Rotavirus D) Rift Valley fever virus

93. Rotavirus NSP4 protein causes:

- A) Intestinal hypersecretion B) Inhibition of viral replication
- C) Enhanced nutrient absorption D) Immune cell activation



94. The primary target cells in infectious bursal disease are:

- A) T lymphocytes
- B) Pre-B lymphocytes
- C) Epithelial cells
- D) Macrophages

95. Feline infectious peritonitis is caused by:

- A) A herpesvirus
- B) A parvovirus
- C) A retrovirus
- D) A coronavirus

96. Which TLR recognizes double-stranded RNA?

- A) TLR3
- B) TLR4
- C) TLR7
- D) TLR9

97. Interferons are:

- A) Viral proteins
- B) Antibodies
- C) Cytokines that induce an antiviral state
- D) Complement proteins

98. Viruses can avoid CTL-mediated killing by:

- A) Increasing MHC class I expression
- B) Suppressing MHC class I expression
- C) Increasing antigen presentation
- D) Enhancing CD8+ T cell activation

99. Which virus family is particularly known for interfering with apoptosis?

- A) Picornaviridae
- B) Herpesviridae
- C) Reoviridae
- D) Orthomyxoviridae

100. Viral serpins function by:

- A) Enhancing apoptosis
- B) Activating complement
- C) Binding and blocking caspases
- D) Stimulating interferon production

101. Which viral protein of poxviruses sequesters dsRNA?

- A) Serpin
- B) Viral RNA
- C) Virokine
- D) PKR inhibitor

102. The V protein of paramyxoviruses inhibits:

- A) Interferon induction and signaling
- B) Viral replication
- C) Antibody production
- D) MHC expression

103. Which strategy is used by retroviruses to avoid immune detection?

- A) Antigenic variation
- B) Integration into host genome
- C) Production of non-neutralizing decoy epitopes
- D) All of the above

104. Which of the following is NOT a mechanism of immune evasion by viruses?

- A) Downregulation of MHC class I
- B) Production of chemokine homologs
- C) Enhancement of CTL activity
- D) Inhibition of interferon signaling

105. Which of the following is an advantage of live-attenuated vaccines?

- A) No risk of reversion to virulence
- B) Induction of immune response similar to natural infection
- C) No interference from maternal antibodies
- D) Easy to produce for all viruses

106. Cold-adapted vaccines are designed to:

- A) Replicate at high temperatures
- B) Replicate at lower temperatures of the nasal cavity
- C) Replicate only in the lower respiratory tract
- D) Be stored at room temperature

107. Marek's disease virus vaccine is derived from:

- A) Attenuated Marek's disease virus
- B) Chickens only
- C) Turkey herpesvirus
- D) Mammalian herpesvirus

108. Acyclovir is effective against herpesviruses because:

- A) It directly kills the virus
- B) It requires herpesvirus thymidine kinase for activation
- C) It requires herpesvirus protease for activation
- D) It requires herpesvirus alkaline phosphatase for activation

109. 29. Oseltamivir (Tamiflu) inhibits:

- A) Neuraminidase
- B) Hemagglutinin
- C) Polymerase
- D) Protease

110. Which antiviral drug inhibits viral reverse transcriptase?

- A) Zidovudine (AZT)
- B) Acyclovir
- C) Oseltamivir
- D) Ribavirin

Mycology:

111. 1. Which dermatophyte genus commonly infects skin, hair, and nails?

- A) Trichophyton
- B) Epidermophyton
- C) Microsporum
- D) Rhizopus

112. Which of the following is a UNIQUE identification feature of *Candida albicans*?

- A) Pseudohyphae formation
- B) Chlamydospore production
- C) Cream colonies
- D) Gram-positive staining

113. Which *Aspergillus* species is the most important cause of invasive pulmonary aspergillosis?
A) *Aspergillus flavus* B) *Aspergillus niger*
C) *Aspergillus fumigatus* D) *Aspergillus terreus*
114. Anthropophilic Dermatophytes are transmitted mainly:
A) Human to humans B) Animals to humans C) Soil to human D) Water to humans
115. *Cryptococcus* identification depends on:
A) Lactose B) Nitrate C) Urease & inositol D) Pseudomycelium
116. In KOH preparation of dermatophytes, KOH is mainly used to:
A) Stain fungal elements C) Digest keratinized tissue debris
C) Destroy fungal hyphae D) Enhance sporulation
117. Oral thrush is a form of:
A) Cutaneous candidiasis B) Systemic candidiasis
C) Mucocutaneous candidiasis D) Dermatophytosis
118. Endothrix hair invasion is most commonly associated with:
A) *Microsporum canis* B) *Trichophyton tonsurans*
C) *Epidermophyton floccosum* D) *Microsporum gypseum*
119. Which dermatophyte lacks microconidia?
A) *Trichophyton rubrum* B) *Microsporum canis*
C) *Epidermophyton floccosum* D) *Trichophyton mentagrophytes*
120. The culture medium commonly used for isolation of dermatophytes is:
A) Blood agar B) MacConkey agar C) Sabouraud dextrose agar D) Chocolate agar
121. Dermatophyte isolated from a nail specimen shows abundant microconidia, rare macroconidia, positive urease test, and positive hair perforation test. The most likely organism is:
A) *Trichophyton mentagrophytes* B) *Trichophyton rubrum*
C) *Epidermophyton floccosum* D) *Microsporum canis*
122. Favus is classically associated with:
A) Tinea corporis B) Tinea cruris
C) Chronic scalp infection with scarring alopecia D) Nail infection only

123. Growth on rice grains is useful in differentiating:
A) *T. rubrum* from *T. mentagrophytes* B) *M. canis* from *M. audouinii*
C) *E. floccosum* from *Microsporum* D) *Candida* from dermatophytes
124. The first-line systemic drug commonly recommended for dermatophytosis is:
A) Amphotericin B B) terbinafine C) Nystatin D) Caspofungin
125. The most important virulence factor of *Cryptococcus neoformans* is :
A) Melanin production B) Urease Production
C) Polysaccharide capsule D) Biofilm formation
126. A major function of the cryptococcal capsule is :
A) Enhanced sporulation B) Antiphagocytic activity
C) Keratin degradation D) Biofilm formation only
127. Which immune defect most strongly predisposes to severe cryptococcosis ?
A) Neutropenia B) Complement deficiency
C) Defective cell-mediated D) IgA deficiency
128. Which of the following is the most common causative agent of mucormycosis in humans?
A) *Mucor* spp. B) *Absidia* spp. C) *Aspergillus fumigatus* D) *Rhizopus arrhizus*
129. Which statement about mucormycosis pathogenesis is CORRECT?
A) It is caused by dermatophytes
B) The fungi have a predilection to invade major blood vessels
C) It only affects immunocompetent individual
D) The hyphae are regularly septate
130. Which of the following differentiates *Rhizopus* from *Mucor* microscopically?
A) Presence of septate hyphae B) Presence of rhizoids and stolons
C) Size of sporangia D) Color of colonies on SDA

Molecular Biology:

131. The backbone of each strand of DNA or RNA

- A) Phosphate group & nitrogen B) Nitrogen & sugar
C) Phosphate group & sugar D) Phosphate group, nitrogen & sugar

132. The phosphodiester linkage is responsible for joining of

- A) Phosphate group to the sugar B) Nitrogen & sugar
C) Phosphate group & nitrogen D) The overall structure

133. The bases of nucleic acids which have fused double rings are

- A) Purines B) Pyrimidines C) Both of D) None of them

134. The Nucleosides are

- A) Bases plus sugar B) Bases plus phosphate
C) Nucleotides plus Phosphate D) Sugar only

135. Chargaff's rule is called when there is

- A) Equimolar amounts of C and G B) Both of them
C) Equimolar amounts of A and T D) None of them

136. The melting temperature of a DNA molecule is defined strictly as

- A) The temperature where exactly melting is complete.
B) The temperature at the halfway point on the melting curve
C) The temperature where exactly melting is not complete
D) None of the above

137. The anticodon that is complementary to the codon carried on

- A) tRNA B) mRNA C) rRNA D) SnRNA

138. Small non translated RNAs which regulate gene expression called

- A) mRNA B) rRNA C) miRNA D) siRNA

139. No matter how many amino acids are added, the growing chain always has an

- A) N-terminus or amino terminus B) Both of A & B
C) α C or Carboxyl terminus D) None of them

140. An assembly of several polypeptide chains to form a final structure of protein called
- A) Quaternary structure
 - B) Secondary structure
 - C) Tertiary structure
 - D) None of them
141. The melting of DNA is affected by
- A) Temperature & salt
 - B) Temperature only
 - C) Temperature & PH
 - D) Temperature, PH&Salt
142. Spectrophotometer detects the amount of UV absorbed when is passed through
- A) Specific solution with no DNA
 - B) DNA only
 - C) Specific solution with DNA
 - D) None of them
143. Bacterial DNA has an exceptional by presence of NO correlation between G/C content and optimum growth temperature because
- A) The bacterial genome has circular shape free ends
 - B) The bacterial DNA has circular shape with No free ends
 - C) The bacterial DNA has neither circular shape nor free ends
 - D) The bacterial DNA has combination of free and non-free ends
144. The central dogma of genetic information during cell growth flows from
- A) Protein to RNA to DNA
 - B) Protein to DNA to RNA
 - C) RNA to DNA to protein
 - D) DNA to RNA to Protein
145. RNA copies of genetic information stored by the DNA and are made by a process called
- A) Transcription
 - B) Translation
 - C) Transduction
 - D) All of them
146. The synthesis of proteins using genetic information carried by mRNA.
- A) Transcription
 - B) Translation
 - C) Transduction
 - D) All of them
147. The ribosome itself consists of about two-thirds of
- A) mRNA
 - B) rRNA
 - C) tRNA
 - D) siRNA

148. The tRNA has an anticodon consisting of three bases that are complementary to the three bases of the codon on the
A) mRNA B) rRNA C) tRNA D) siRNA
149. To function properly, many proteins need extra components, called
A) Extra factors B) Prosthetic group C) Carboxyl group D) All of them
150. Enzymes are part of
A) Structural proteins B) Regulatory proteins
C) Transport proteins D) None of them

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