60112

ROLL No. | | | | | |

TEST BOOKLET No. 271

TEST FOR POST GRADUATE PROGRAMMES

BIOTECHNOLOGY

Time: 2 Hours

Maximum Marks: 450

INSTRUCTIONS TO CANDIDATES

1. You are provided with a Test Booklet and an Optical Mark Reader (OMR) Answer Sheet to mark your responses. Do not soil the Answer Sheet. Read carefully all the instructions given on the Answer Sheet.
2. Write your Roll Number in the space provided on the top of **this page**.
3. Also write your Roll Number, Test Code, and Test Subject in the columns provided for the same on the **Answer Sheet**. Darken the appropriate bubbles with a **Ball Point Pen.**
4. The paper consists of 150 objective type questions. All questions carry equal marks.
5. Each question has four alternative responses marked **A, B, C** and **D** and you have to **darken** the bubble fully by a **Ball Point Pen** corresponding to the correct response as indicated in the example shown on the Answer Sheet.
6. Each correct answer carries **3** marks and each wrong answer carries **1** minus mark.
7. Please do your rough work only on the space provided for it at the end of this Test Booklet.
8. You should return the Answer Sheet to the Invigilator before you leave the examination hall. However, you can retain the Test Booklet.
9. Every precaution has been taken to avoid errors in the Test Booklet. In the event of such unforeseen happenings the same may be brought to the notice of the Observer/Chief Superintendent in writing. Suitable remedial measures will be taken at the time of evaluation, if necessary.

SEAL

60112

BIOTECHNOLOGY

1. Which of the following transgenic plant is a B-carotene yielder?

   (A) Rice (B) Carrot
   (C) Pea (D) Tomato

2. LSC and SSC regions of the genome are found in

   (A) nucleus (B) mitochondrion
   (C) chloroplast (D) bacterium

3 The CCMB is situated in

   (A) Lucknow (B) New Delhi
   (C) Hyderabad (D) Chandigarh

4. Ac-Ds higher plant transposon was first described in

   (A) maize (B) arabidopsis
   (C) tobacco (D) pea

5. A bacterium can divide every 20 min. Beginning with a single individual, how many bacteria will there be in the population, if there is an exponential growth for 3 hours?

   (A) 18 (B) 440
   (C) 512 (D) 1024

6. An allergic reaction is initiated by the following antibody

   (A) Ig G (B) Ig M
   (C) Ig A (D) Ig E

7. DNA foot-printing is used to

   (A) settle disputed parentage
   (B) detect protein-binding site on the DNA
   (C) clone DNA
   (D) separate DNA by PFGE

8. Which one of the following genes confers freezing tolerance in animals?

(A) Aaa3
(B) CAT
(C) Aroa
(D) ADH

9. Producing a blue-coloured rose involves manipulation of

(A) flavonoid biosynthesis pathway
(B) carotenoid biosynthesis pathway
(C) chlorophyll biosynthesis pathway
(D) alkaloid biosynthesis pathway

10. Glyphosate is a herbicide which inhibits

(A) pigment biosynthesis
(B) nucleic acid biosynthesis
(C) energy production
(D) aromatic amino acid biosynthesis

11. In polymerase chain reaction, the DNA denaturation temperature is

(A) 95°C
(B) 75°C
(C) 120°C
(D) 65°C

12. P53 is implicated in

(A) cystic fibrosis
(B) tumor suppression
(C) alzheimers
(D) AIDS

13. The most abundant polysaccharide on Earth is

(A) cellulose
(B) chitin
(C) lignin
(D) starch

14. The most abundant RNA present in the cell is

(A) mRNA
(B) tRNA
(C) rRNA
(D) anti-sense RNA

15. GFP is isolated from

(A) chloroplast
(B) flowers
(C) jelly fish
(D) wings of butterfly

16. Cloning was first carried out in

(A) monkey (B) cat
(C) guinea pig (D) lamb

17. Guy's 13 Ab has been successfully generated through

(A) stem cell culture (B) hela cell culture
(C) tobacco root culture (D) hybridoma cell culture

18. Thousands of gene expression can be studied using the following technique:

(A) DNA finger printing (B) PCR
(C) Gene finder (D) Micro array technique

19. Which one of the following is involved in alcohol production?

(A) Aspergillus (B) Zygomonas
(C) Bacillus (D) Acetobacter

20. By which method can DNA be directly introduced into a cell without a vector?

(A) Gene knock out (B) Gene amplification
(C) Antisense RNA technology (D) Electroporation

21. Dideoxy nucleotide is commonly employed in

(A) mutation (B) nucleotide substitution
(C) DNA sequencing (D) DNA repair

22. Which of the following enzyme is specifically used in PCR?

(A) Ligase (B) Reverse transcriptase
(C) Methylase (D) *Taq* polymerase

23. PCR was invented by

(A) E M Southern (B) Kerry Mullis
(C) Melvin Calvin (D) Hatch and Slack

24. The Hybridoma cells have the capacity of producing

(A) RBC
(B) antigen
(C) CD4 cells
(D) antibodies

25. RFLP can be used in

(A) forensic study
(B) intron analysis
(C) amplification of template
(D) comparison of closely related species

26. Chloroplast contains the following pigments:

(A) Chlorophyll a
(B) Chlorophyll b
(C) Carotenoids
(D) All of the above

27. Which of the following gas is involved in global warming?

(A) CO
(B) CH_4
(C) SO_2
(D) O_3

28. The cultivation of honey bees is called

(A) agriculture
(B) sericulture
(C) apiculture
(D) moriculture

29. Cells without cell wall are called

(A) tonoplasts
(B) protoplasts
(C) leucoplasts
(D) chromoplasts

30. Virus-free plants can be obtained through

(A) root culture
(B) mericloning
(C) callus culture
(D) floriculture

31. An organism capable of causing disease is known as

(A) phage
(B) mycoplasma
(C) fungus
(D) pathogen

32. Which one of the following plant is used for bio-diesel production?

(A) Sunflower
(B) Castor
(C) Jatropha
(D) Groundnut

33. The haploids can be raised from

(A) endosperm
(B) callus
(C) somaclone
(D) pollen

34. The structure of the protein is mostly determined by

(A) hydrogen bonds
(B) amino acid sequence
(C) disulphide bridges
(D) polypeptides

35. The number of units of activity per mg protein of enzyme is known as

(A) specific activity
(B) turn over number
(C) molar activity
(D) allosteric activity

36. Crown-gall is caused by

(A) candida
(B) fusarium
(C) agrobacterium
(D) azospirillum

37. In commercially important seeds, the dormancy can be broken by

(A) 2,4-D
(B) ABA
(C) GA_3
(D) IBA

38. Which among the following is an important rice biofertilizer?

(A) Water hyacinth
(B) Ottelia
(C) Pistia
(D) Azolla

39. Non Watson-Crick pairing is most common in

(A) A-DNA
(B) B-DNA
(C) C-DNA
(D) Z-DNA

40. The first transgenic animal reported was a

(A) mouse (B) pig
(C) fish (D) lamb

41. Which of the following is a post-translational event?

(A) Addition of polyA tail (B) Methylation
(C) Demethylation (D) Glycosylation

42. Which of the following antibiotics is of recent origin?

(A) Penicillin (B) Tetracyclin
(C) Streptomycin (D) Ciprofloxacin

43. Which of the following environmentally friendly marker is employed in modern molecular biology?

(A) Antibiotics (B) Tracers
(C) EPSPS (D) Metabolic genes

44. Cells have a mechanism that removes introns and yields mRNA. This process is specifically called as

(A) RNA splicing (B) RNA maturation
(C) processing of RNA (D) RNA editing

45. Among the following, which one of them is not protein but an enzyme?

(A) Metallo enzyme (B) Allosteric enzyme
(C) Zymogen (D) Ribozyme

46. The process of making a product of a gene is

(A) genetic map (B) gene therapy
(C) gene expression (D) genetic engineering

47. An RNA molecule that complements another RNA is called

(A) mRNA (B) RNA duplex
(C) amplification (D) antisense RNA

48. According to Food Safety Standards Authority of India, which of the following states supply purest milk?

(A) Puducherry and Goa
(B) Tamilnadu
(C) Karnataka and Kerala
(D) Andhra Pradesh

49. What is the current level of CO_2 in the atmosphere?

(A) 392 ppm
(B) 300 ppm
(C) 240 ppm
(D) 200 ppm

50. Recently, International AIDS Vaccine Initiative (IAVI) identified the following finding in AIDS patients:

(A) ART
(B) Vaccine
(C) Target binding
(D) Neutralizing antibody (bNAbs)

51. Many of the biosynthesized nanoparticles exhibit a common property such as

(A) antimicrobial activity
(B) X-RD
(C) plasmon resonance
(D) quantum dot

52. Frederick Sanger who won the Nobel Prize twice discovered

(A) 2,3-didoexynucleotide method for DNA sequencing
(B) Labeling of 3′ end of DNA with P^{32}
(C) Automatic sequencing
(D) Capillary gel sequencing

53. The whole complex of binding an antibody to a bacterial toxin covalently is called

(A) immuno complex
(B) immuno adhesion
(C) magic bullet
(D) ricin

54. The heavy metal binding protein, metallothionein, is rich in

(A) arginine
(B) histidine
(C) methionine
(D) cysteine

55. The first genome to be sequenced was from

(A) *Haemophilus influenza* (B) *E. coli*
(C) *Saccharomycetes cerevisae* (D) *Plasmodium falciparum*

56. Which one of the following is a nitrogen-fixing bacterium?

(A) Rhizobium (B) Frankia
(C) Acetobacter (D) Thiobacillus

57. The first case of a life patenting was done by

(A) Anand Chakrabarty (B) Milstein and Kohler
(C) Rolfe (D) Cocking

58. HIV binds to the following molecule:

(A) CD4 (B) CD8
(C) MHC I (D) MHC II

59. The study of genetic manipulation of a cell leading to overproduction of a particular metabolite is called

(A) enzyme engineering (B) metabolic engineering
(C) metabolic derangement (D) end product inhibition

60. Which one of the following is a radiative gas?

(A) H_2 (B) O_2
(C) CO_2 (D) N_2

61. Skin colour in man is determined by

(A) single gene (B) poly genes
(C) alleles (D) mutant genes

62. The human genome consists of the following number of genes:

(A) 100,000 (B) 50,000
(C) 30,000 (D) 15,000

63. The first recombinant protein produced was

(A) Thrombin
(B) Humilin
(C) Factor VIII
(D) Cyclodextrin

64. Gene therapy is mostly employed against

(A) genetic diseases
(B) fungal diseases
(C) bacterial diseases
(D) viral diseases

65. Which of the following is a bifunctional enzyme?

(A) RuBPCase
(B) PEPCase
(C) PEPKinase
(D) Malic enzyme

66. The GM crop that faces biggest challenge in India for commercialisation is

(A) Bt-cotton
(B) Bt-maize
(C) Bt-brinjal
(D) Bt-potato

67. One of the plants that exhibits antimitotic activity as a prelude to treatment of cancer is

(A) onion
(B) cluster bean
(C) soybean
(D) cabbage

68. To increase drought tolerance in plants, the following gene is employed:

(A) Mtl-D
(B) Pro
(C) Bet
(D) HSP

69. The most popular gene to induce herbicide tolerance in plants is

(A) LUC
(B) GFP
(C) aroa
(D) CAT

70. HBSAg is a very popular edible vaccine produced in

(A) potato
(B) cauliflower
(C) sugarcane
(D) beet root

71. Enzyme can be engineered using the following technique

(A) Site-directed mutagenesis
(B) Physical mutagen
(C) Chemical mutagen
(D) Induction of disulfide bridges

72. In tissue culture the following auxin is primarily required:

(A) Myo-inositol
(B) IPA
(C) 2,4-D
(D) IBA

73. Our coastal regions can be guarded against tsunami more economically by employing

(A) blockades
(B) concrete walls
(C) cement blocks
(D) mangrove afforestation

74. Nucleic acids absorb maximally at

(A) 240 nm
(B) 250 nm
(C) 260 nm
(D) 280 nm

75. Most higher eukaryotes contain

(A) exons
(B) introns
(C) exons and introns
(D) overlapping genes

76. When the final product of a metabolic pathway inhibits the action of the existing enzymes, the process is called

(A) repression
(B) feedback inhibition
(C) catabolic repression
(D) uncompetitive inhibition

77. The emerging defense strategy employed in plants against biotic and biotic stresses is

(A) abscisic acid (ABA)
(B) salicylic acid (SA)
(C) jasmonic acid (JA)
(D) ABA-SA-JA inter metabolic pathway

78. In recent times, Multiphoton Fluoroscence Microscope is employed in the detection of

(A) cancer
(B) jaundice
(C) malaria
(D) AIDS

79. The most important potentially industrial application of halophilic bacteria is

(A) stress tolerant proteases
(B) osmoregulatory compounds
(C) salinity tolerance
(D) stress protective agents

80. Jatropha is considered as a wonder plant because of its

(A) drought tolerance
(B) unpalatability to animals
(C) high oil content in seeds
(D) All of the above

81. Which of the following is a non-leguminous plant to contain leghaemoglobin in N_2 fixing root nodules?

(A) *Arachis hypogaea*
(B) *Paraponia andersonii*
(C) *Glycine max*
(D) *Cyamopsis tetragonaloba*

82. Transgenic plants accumulating glycine betaine were found to exhibit more tolerance to

(A) salinity
(B) heavy metals
(C) cold
(D) high temperature

83. An anti-oxidant vitamin is

(A) ascorbic acid
(B) biotin
(C) pantothenic acid
(D) deoxy-calciferol

84. The light-dependent uptake of O_2 and evolution of CO_2 in photosynthetic organism is called

(A) light reaction
(B) dark reaction
(C) photorespiration
(D) oxygenase reaction

85. To avoid transgene escape to the environment, genes are cloned into chloroplast for expression and the process is called

(A) vectorless mode of transformation
(B) green technology
(C) metbolic engineering
(D) transplastomic technology

86. The antioxidants of green tea specifically prevent

(A) cancer
(B) jaundice
(C) hypertension
(D) AIDS

87. To distinguish intraspecific genetic variation, the identification tool employed is:

(A) RFLP
(B) RAPD
(C) DNA bar coding
(D) PCR

88. Which of the following is a new threat to the environment?

(A) Heavy metals
(B) Radioactive wastes
(C) Radiative gases
(D) e-Wastes

89. Eco RI is isolated from

(A) *E. coli*
(B) *A. niger*
(C) *B. thuringensis*
(D) fire fly

90. The total genetic material collected and sequenced from an environment is called

(A) structural genomics
(B) metagenomics
(C) functional genomics
(D) genetic diversity

91. The vast majority of life on Earth is

(A) plants
(B) animals
(C) insects
(D) microbes

92. In the case of genetic diseases and spinal cord injury, the efficacy of the following therapy is tested:

(A) Neural stem cells
(B) Embryonic stem cells
(C) Bone marrow stem cells
(D) A combination of all the above

93. Antisense coat protein gene is used against

(A) pest resistance
(B) viral resistance
(C) nematode resistance
(D) fungal resistance

94. Which of the following treatment in the control of malaria is promising and environmentally safe?

(A) Pyrethroids
(B) Chloroquinone
(C) Indoor spray of chemicals
(D) Artemisinin-based combination therapy

95. The genome of *Trichoderma sp.* potentially codes for an industrially relevant product

(A) Gliotoxin
(B) Atmospheric N_2 fixation
(C) Aegerolysins
(D) Chitinase and glucanase

96. One of the following is a novel ornamental plant commercially grown in nurseries:

(A) Crotons
(B) Rose
(C) Ferns
(D) Cycas

97. *Helicoverpa armigera* is an important pest of

(A) brinjal
(B) cotton
(C) potato
(D) papaya

98. Given the DNA sequence, ATTAAGGC, which one of the following is the antisense RNA?

(A) AUUAAGGC
(B) UAAUUCCG
(C) CGGAATTA
(D) TAATTCCG

99. The transgenic plant 'flavr-savr' is characterized by

(A) delayed ripening
(B) longer shelf life
(C) aroma
(D) All of the above

100. Photo gene has been identified in

(A) nucleus
(B) mitochondrion
(C) cytoplasm
(D) chloroplast

101. Which vector is commonly used to express a foreign gene in a dicot plant?

(A) Baculovirus vector
(B) Retroviral vector
(C) Transposon
(D) Ti-plasmid

102. Transfer of T-DNA from Ti-plasmid into a plant cell is mediated by

(A) MOB genes
(B) VIR genes
(C) CAT genes
(D) OCT-NOP genes

103. Plant developed from pollen is called

(A) monoecious plant
(B) di-haploid plant
(C) sterile plant
(D) androgenic plant

104. The production of pharmaceuticals through *in vitro* culture is called

(A) metabolic engineering
(B) recombinant protein
(C) biopharming
(D) pharmaceutical engineering

105. Restriction endonuclease is employed in cutting

(A) single-stranded DNA
(B) double-stranded DNA
(C) double-stranded RNA
(D) anti-sense RNA

106. Reverse transcriptase is

(A) RNA dependent RNA polymerase
(B) DNA dependent RNA polymerase
(C) DNA dependent DNA polymerase
(D) RNA dependent DNA polymerase

107. The common feature among the nucleus, chloroplast and mitochondrion is

(A) lamellae
(B) DNA
(C) cristae
(D) ETC

108. A technique of using very small metal particles coated with desired gene in gene transfer is called

(A) electroporation
(B) microinjection
(C) biolistics
(D) conjugation

109. Which of the following is a stable isotope?

(A) O^{18}
(B) C^{14}
(C) P^{32}
(D) H^{3}

110. Which of the following bacteria is involved in the biosorption and detoxification of heavy metals?

(A) *Pseudomonas aeruginosa*
(B) *Pseudomonas putida*
(C) *Rhizobium japonicum*
(D) *Bradyrhizobium sp.*

111. In the analysis of heavy metals, which of the following instrument is essentially used?

(A) FTIR
(B) SDS-PAGE
(C) Sieve chromatography
(D) AFM

112. Rheumatoid arthritis is

(A) an auto immune disorder
(B) an immunosuppressive reaction
(C) a hypersensitive reaction
(D) a heavy metal-induced disorder

113. Nanoparticles can be confirmed by the following method:

(A) X-RD
(B) UV-VIS spectrophotometer
(C) SEM
(D) All of the above

114. Which bacterium is known as the 'Work Horse' in molecular biology?

(A) Pseudomonas
(B) Acetobacter
(C) *E. coli*
(D) Azotobacter

115. Eukaryotic polypeptides are synthesized on the following ribosome complex:

(A) 80S
(B) 70S
(C) 60S
(D) 40S

116. Catalytic antibodies are called

(A) abzymes
(B) ribozymes
(C) lysozyme
(D) novozymes

117. Harvesting the solar energy is carried out by one of the plastids:

(A) Amyloplast
(B) Leucoplast
(C) Chromoplast
(D) Chloroplast

118. Hairy roots are induced *in vitro* by the following bacterium:

(A) *Agrobacterium tumefaciens*
(B) *Agrobacterium rhizogens*
(C) *Rhizobium japonicum*
(D) *Pseudomonas sp.*

119. The following one is a non-communicable disease:

(A) Diabetes
(B) Jaundice
(C) Dengue fever
(D) Chikungunya

120. According to the Human Genome Project study, what is the percentage of coding genes?

(A) 3%
(B) 10%
(C) 15%
(D) 20%

121. The following is the second messenger in plants:

(A) Calmodulin
(B) Plasmodemma
(C) Nodulin
(D) Golgi body

122. Somaclones are due to variation in

(A) ploidy level
(B) protein profile
(C) plastid number
(D) 2,4-D concentration

123. Conversion of CO_2 to methanol using solar energy is called

(A) dark reaction
(B) photosynthesis
(C) light reaction
(D) artificial photosynthesis

124. Identification of mud crabs belonging to the genus Scylla is carried out by the following tool:

(A) PCR
(B) RAPD
(C) RFLP
(D) Micro array

125. Cry1 expression in Bt cotton is affected by the following abiotic stress:

(A) water stress
(B) salinity stress
(C) cold stress
(D) heat shock stress

126. The epiphytic lichens act as bio-indicators of

(A) pollution
(B) atmospheric moisture
(C) ambient temperature
(D) global warming

127. The normal BP of an individual should be

(A) 120/80
(B) 140/90
(C) 110/90
(D) 100/80

128. The nanoparticles are potent

(A) bacteriocide
(B) fungicide
(C) nematicide
(D) biopesticide

129. The chief proponent of endosymbiosis theory is

(A) Rosalind Franklin
(B) Darwin
(C) Milton
(D) Margulies

130. Sexual incompatibility can be overcome by

(A) *In vitro* fertilization
(B) hybridization
(C) cloning
(D) cell culture

131. Aromatic amino acids are biosynthesized by a special pathway called

(A) terpenoid pathway
(B) shikimic acid pathway
(C) glycolate pathway
(D) glyoxalate pathway

132. In addition to mitochondria, there is one more power house in plant cells called

(A) nucleus
(B) glyoxysome
(C) chloroplast
(D) peroxisome

133. Against dental caries, the following edible plantibody has been produced:

(A) Guy's 13 antibody
(B) Ig E
(C) Ig A
(D) humanized antibody

134. Vinblastin is produced by

(A) *Rosa indica*
(B) *Vinca rosea*
(C) *Vernonia cinera*
(D) *Victoria regia*

135. Spacers are present in

(A) polycistronic mRNA
(B) mRNA
(C) tRNA
(D) RNAi

136. Phylogenetic tree can be constructed by using the following software:

(A) clustal W
(B) MSa
(C) gene finder
(D) ORF finder

137. Which one of the following gases plays a key role in animal cell culture?

(A) CO_2
(B) O_2
(C) H_2
(D) O_3

138. In the case of nuclear power plant disaster, the radioactive rays emitted can be detected employing the following instrument:

(A) GM Counter (portable)
(B) Blotting analysis
(C) Autoradiography
(D) FTIR

139. The most common substrate used in distilleries for the production of ethanol is

(A) molasses
(B) corn meal
(C) soya meal
(D) potato starch

140. The RNAi technology has been used in the development of plants resistant to

(A) insects
(B) nematode
(C) fungi
(D) mycoplasma

141. The most important ornamental plant decorating many international airports is

(A) cycas
(B) fern
(C) orchids
(D) bonsai

142. The advantage of immobilized enzyme is

(A) recycling of the enzyme
(B) to avoid enzyme inhibition
(C) to get pure end product
(D) to reduce the Km value

143. Which of the following is a sugar-free plant for diabetic patient?

(A) Stevia
(B) Gymnema
(C) Phyllanthus
(D) Curcuma

144. Agar agar is obtained from

(A) *Agaricus sp.*
(B) polyporus
(C) *Fusarium sp.*
(D) seaweeds

145. For large scale production of single cell protein, the following mode of culture is resorted to:

(A) Petri plate
(B) simple culture flask
(C) continuous culture
(D) bioreactor

146. For disposal of municipal organic wastes, the following tool is used:

(A) Incineration
(B) Vermicompost
(C) Fermentor
(D) *Ex situ* remediation

147. Pyrimidine dimer is induced by

(A) visible light
(B) gamma rays
(C) UV rays
(D) infra-red rays

148. The following enzyme provides protection against UV light in plants:

(A) Isocitrate lyase
(B) Photolyase
(C) Glycolate oxidase
(D) Peroxidase

149. The important function of folic acid metabolism is

(A) chlorophyll biosynthesis
(B) Haeme biosynthesis
(C) DNA synthesis and repair
(D) synthesis of cytochrome

150. In the preparation of fast food in the modern world, the following irradiation is made use for safety purposes:

(A) UV rays
(B) Infra red rays
(C) Microwaves
(D) Gamma rays

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