A
SET

Booklet No. :

BT - 15

Bio Technology

Duration of Test : 2 Hours **Max. Marks : 120**

Hall Ticket No.

Name of the Candidate : _____

Date of Examination : _____ **OMR Answer Sheet No. :** _____

_____ _____

Signature of the Candidate **Signature of the Invigilator**

INSTRUCTIONS

1. This Question Booklet consists of **120** multiple choice objective type questions to be answered in **120** minutes.
2. Every question in this booklet has 4 choices marked (A), (B), (C) and (D) for its answer.
3. Each question carries **one** mark. There are no negative marks for wrong answers.
4. This Booklet consists of **16** pages. Any discrepancy or any defect is found, the same may be informed to the Invigilator for replacement of Booklet.
5. Answer all the questions on the OMR Answer Sheet using **Blue/Black ball point pen only.**
6. Before answering the questions on the OMR Answer Sheet, please read the instructions printed on the OMR sheet carefully.
7. OMR Answer Sheet should be handed over to the Invigilator before leaving the Examination Hall.
8. Calculators, Pagers, Mobile Phones, etc., are not allowed into the Examination Hall.
9. No part of the Booklet should be detached under any circumstances.
10. The seal of the Booklet should be opened only after signal/bell is given.

BIO TECHNOLOGY (BT)

1. The value of p for which the system of equations $x + 5y + 3z = 0$, $5x + y - pz = 0$ and $x + 2y + pz = 0$ has non zero solution is

(A) $p = \frac{1}{2}$ (B) $p = 0$ (C) $p = 2$ (D) $p = 1$

2. The eigen values of the matrix are $\begin{bmatrix} 2 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 3 \end{bmatrix}$

(A) $1, \frac{\sqrt{5}}{2}, \frac{-\sqrt{5}}{2}$ (B) $1, \frac{5+\sqrt{5}}{2}, \frac{5-\sqrt{5}}{2}$

(C) $1, \sqrt{5}, -\sqrt{5}$ (D) purely imaginary

3. If $u(x, y) = \frac{x^2 y^2}{x^2 + y^2}$ then $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y}$ is equal to

(A) $4u$ (B) $\frac{1}{2}u$ (C) $2u$ (D) $\frac{1}{4}u$

4. The Fourier series expansion of $f(x) = \sin^3 x$ in the interval $(0, 2\pi)$ is equal to

(A) $\frac{1}{4}\sin x - \frac{3}{4}\sin 3x$ (B) $\frac{3}{4}\sin x + \frac{1}{4}\sin 3x$

(C) $\frac{3}{4}\sin x - \frac{1}{4}\sin 3x$ (D) none

5. The particular integral of the differential equation $(1 + D)^2 y = x^2 + x$ is equal to

(A) $x^2 + 2x + 3$ (B) $(1 + x)^2$ (C) $x^2 - 3x - 4$ (D) $x^2 + x$

6. The solution of one dimensional wave equation $\frac{\partial^2 y}{\partial t^2} = c^2 \frac{\partial^2 y}{\partial x^2}$ is of the form

(A) $(c_1 e^{px} + c_2 e^{-px})(c_3 \cos pt + c_4 \sin pt)$

(B) $(c_1 x + c_2)(c_3 \cos pt + c_4 \sin pt)$

(C) $(c_1 \cos px + c_2 \sin px)(c_3 \cos pt + c_4 \sin pt)$

(D) none of these

7. An electronic assembly consists of two subsystems A and B. From the past experience, it is known that P(A fails) = 0.20, P(A and B fail) = 0.20 and P(B fails alone) = 0.15. The probability that P (A fails / B has failed) is

(A) $\frac{3}{7}$ (B) 0.15 (C) $\frac{2}{15}$ (D) $\frac{4}{7}$

8. If the distribution function (DF) is $F(x) = 1 - e^{-kx}$, $x > 0$, $k \geq 0$, the probability distribution function (PDF) is

(A) ke^{-kx} (B) e^{-kx} (C) 0 (D) 1

9. By intermediate value theorem one of the interval in which one root of the function $f(x) = x^2 - x - 2$ lies is

(A) (0, 1) (B) (–1, 0) (C) (1, 3) (D) None of these

10. Taylor series approximation (up to third order) of the solution $\frac{dy}{dx} = x^2 + y$ with the initial condition $y(0) = 1$ is

(A) $1 + x + \frac{x^2 + x^3}{2}$ (B) $1 + x + \frac{x^2}{2}$

(C) $1 + x + \frac{x^2}{2} + \frac{x^3}{3}$ (D) $1 + x + \frac{x^3}{3}$

11. What will be the F2 phenotypic ratio in a dihybridization experiment in which one character exhibits complete dominance whereas the second character exhibits co-dominance ?

(A) 12 : 3 : 1 (B) 9 : 3 : 4

(C) 3 : 6 : 3 : 1 : 2 : 1 (D) 9 : 3 : 3 : 1

12. A carrier female for taysachs disease marries a man who is also carrier for the same condition. What will be the probability that their first child is normal female ?

(A) 2/8 (B) 1/8 (C) 4/8 (D) 3/8

13. In a dihybrid two genes A and B are located at a distance of 16 map units. If the dihybrid is in repulsion phase, what will be the proportion of Ab gametes ?

(A) 84% (B) 42% (C) 21% (D) 8%

14. Taysachs disease caused due to mutation in

(A) Homogentisate oxidase (B) β hexoseaminidase

(C) Tyrosinase (D) Pyruvate decarboxylase

15. In the fallowing phenotypes, which one is related to Recessive epistasis ?

(A) 9 : 3 : 4 (B) 13 : 3 (C) 15 : 1 (D) 9 : 6 : 1

16. A mutation to DNA polymerase that eliminated the 5^I to 3^I exonuclease activity would prevent

(A) Ligation of the Okazaki fragments (B) Removal of the RNA primer

(C) Removal of the base mismatches (D) Repair of deaminated bases

17. How many high energy bonds are required for the recruitment of 2^{nd} amino acid in Ribosomes in translation ?

(A) 3 (B) 2 (C) 4 (D) 6

18. Which of the following pair is not correctly described ?

(A) 5^{I} splice site : begins with GU, marks 5^{I} end of intron

(B) Branch site : contains A that binds U2 ; branch site of lariat

(C) 3^{I} splice site : begins with AG, marks 3^{I} end of intron

(D) Trimer : consists of U4/U6 and U5, brings 5^{I} splice site to branch site

19. Which of the following protein families are chromosome remodelling complexes ?

(A) HATs (B) SWI/SNF (C) TFIID (D) XPA

20. If an mRNA has 207 nts length, what will be the molecular weight of protein synthesized from that mRNA ?

(A) 8.8 KD (B) 7.6 KD (C) 7.5 KD (D) 8.7 KD

21. Which of the following toxins inhibits eukaryotic protein synthesis through the depurination of a single adenine residue in 28 S ribosomal RNA (r RNA)

(A) Diptheria toxin (B) Ricin

(C) α-Sarcin (D) Colicin E-3

22. Most of the gram –ve bacteria shows quorum sensing by the release of

(A) Homoserine lactones (B) phospho lactones

(C) Phosphoserine lactones (D) Phosphoinositol lactone

23. The process in which a molecule is transported into the cell while being chemically altered is called

(A) Passive transport (B) Group translocation

(C) Facilitated transport (D) Active transport

24. During the transformation in bacteria the exogonate DNA combines with endogonate DNA to form a triple stranded structure. Which protein is involved in the formation of double cross-over between exogonate and endogonate strands ?

(A) Rec B (B) Rad 51 (C) Rec A (D) Ruv A

25. Proteins which are responsible for induction of lytic phase from lysogenic phase in bacteriophases

(A) CI (B) Cro (C) Gag (D) Pol

26. *Agrobacterium tumefaciens* is not an effective vector for

(A) Rice (B) Soya bean (C) Tomato (D) Sorghum

27. Which of the following bacteria is chemolitho-autotroph ?

(A) Purple and green sulphur bacteria (B) Purple non sulphur bacteria
(C) Green non sulphur bacteria (D) sulphur oxidizing bacteria

28. Halobacterium and other extremely halophillic bacteria have significantly modified the structure of their proteins and membranes by

(A) increasing intracellular Na^+ and K^+ levels.
(B) increasing intracellular Ca^{++} levels.
(C) increasing extracellular Cl^- ions.
(D) increasing intracellular Cl^- ions.

29. Amino acid with highest positive hydropathy index

(A) Leucine (B) Isoleucine (C) Methionine (D) Tryptophan

30. Which RNA plays a role in protein targeting ?

(A) tm RNA (B) P RNA (C) i RNA (D) 7SL RNA

31. Peptide antibiotic which is synthesized without the involvement of Ribosomes

(A) Actinomycin-D (B) Gramicidin
(C) Streptomycin (D) Valinomycin

32. An alpha helix made up of 114 aminoacid residues. What will be the value of its axial length and also length when polypeptide chain is fully extended?

(A) 171 Å , 410.4 Å (B) 171 Å, 171 Å
(C) 410.4 Å , 171 Å (D) 410.4 Å, 410.4 Å

33. Refsum's disease arises due to defective

(A) β -Oxidation pathway (B) α Oxidation pathway
(C) ω Oxidation pathway (D) TCA cycle

34. Liddle's syndrome is associated with

(A) excessive Ca^{++} absorption (B) excessive K^+ absorption
(C) excessive Na^+ absorption (D) excessive Mg^{++} absorption

35. Which of the following is an excitatory neurotransmitter ?

(A) GABA (B) Glycine (C) Dopamine (D) Glutamine

36. Rb and P^{53} both are genes that function in regulating the cell cycle transition from

(A) S to G2 (B) G2 to M (C) M to G1 (D) G1 to S

37. Enzyme which is called as pace maker of glycolysis

(A) Hexokinase (B) Phosphohexose isomerise
(C) Phosphofructo kinase (D) Triose phosphate isomerise

38. The difference in the Theoretical and practical time duration of protein folding is called

(A) Levinthal paradox (B) C-Value paradox

(C) Raven paradox (D) Ross's paradox

39. Which of the following glycolysis intermediate will regulate the binding of O_2 to haemoglobin ?

(A) Glyceraldehyde-3-phosphate (B) Dihydroxy acetone phosphate

(C) 2, 3 bis phosphoglycerate (D) Phosphoenol pyruvate

40. Three restriction enzymes A, B and C have six, eight and four base pairs as their recognition sites respectively. The ratios of the number of fragments that will generate on restriction digestion of a genomic DNA of E. coli are approximately

(A) 1 : 64 : 16 (B) 16 : 256 : 6 (C) 16 : 256 : 1 (D) 256 : 16 : 1

41. The secretory IgM was electrophoresed on SDS PAGE under reduced and denaturing conditions. The number of polypeptide bands detected on the gel is

(A) 2 (B) 3 (C) 4 (D) 5

42. RBC and Platelets destruction occurs in spleen. The process is called

(A) Hemocatheresis (B) Hemolysis

(C) Hemopoiesis (D) Hemogenisis

43. Which of the following is not present on the neutrophil membrane ?

(A) TLR-2 (B) TLR-4 (C) MHC-II (D) Fc ϒ R

44. In which stage of the B-cell development Ig gene rearrangement occurs ?

(A) Hematopoietic stem cell to lymphoid progenitor

(B) Lymphoid progenitor to pre B-cell

(C) Pro B-cell to Pre B-cell

(D) Immature B-cell to mature B-cell

45. α-Defensins are found in

(A) Azurophilic granules of polymorphonuclear leucocytes

(B) Epithelial cells

(C) Lymphocytes

(D) Macrophages

46. CD 40 ligand is seen only on

(A) Macrophages (B) Cytotoxic T-cells

(C) Helper T-cells (D) Dendritic cells

47. In celiac disease there is T-cell sensitivity to

(A) B adrenergic receptor (B) Myelin basic proteins

(C) Gluten (D) Gastric H^+ -K^+ dependent ATPase

48. Which cells first recognise grafted foreign tissue and starts the process of rejection ?

(A) Helper T-cells (B) Macrophages

(C) Cytotoxic T-cells (D) B-cells

49. Accumulation of lactic acid causes metabolic acidosis due to deficiency of

(A) Pyruvate kinase (B) Citrate synthase

(C) Pyruvate decarboxylase (D) Malate dehydrogenase

50. The primer used for the amplification had the following composition. Calculate the annealing temperature, A = 6, T = 4, G = 5, C = 5

(A) 60 °C (B) 50 °C (C) 70 °C (D) 40 °C

51. On an average each human chromosome contains 0.1 billion base pairs of DNA. The carrying capacity of a yeast vector is 10^3 Kbp. How many molecules of YAC required for inserting the chromosomal DNA ?

(A) 10^2 (B) 10^3 (C) 10^4 (D) 10^5

52. Which of the following pair is Neoschizomer ?

(A) Mbo I , Sau 3A (B) Hind III , Eco RI

(C) Xma I , Pst I (D) Sma I, Xma I

53. In electroporation, once critical field is achieved there is a rapid localized rearrangement of lipids which results a structure called Pre-Pore complex. Which is a right statement for Pre-Pore complex ?

(A) Pre-Pore complex has 3Å diameter and it is electrically conductive.

(B) Pre-Pore complex has 4Å diameter and it is electrically non conductive.

(C) Pre-Pore complex has 4Å diameter and it is electrically conductive.

(D) Pre-Pore complex has 3Å diameter and it is electrically non conductive.

54. In a sequencing reaction, instead of d ATP, dd ATP was added, what will be the consequence ?

(A) Normal DNA synthesis would occur

(B) No DNA synthesis would occur

(C) Synthesis would terminate randomly regardless of the nucleotide incorporated

(D) Synthesis would always stop at the position at which the first A was incorporated

55. The structural analogue of folic acid which is widely used to control cancer

(A) Methotraxate (B) Nalidixic acid (C) Cisplatin (D) Etoposide

56. Choose the wrong statement from the following statements :
(A) BMR increases with increase of surface area
(B) Infants and growing children show high BMR
(C) In warm climates, the BMR is higher when compared to cold climates
(D) BMR increases in persons who do regular exercise

57. Diptheria toxin inhibits protein synthesis by
(A) binding with 60S ribosomal sub unit
(B) inhibits peptidyl transferase
(C) inactivates elongation factor eEF2
(D) inhibits binding of aminoacylt-RNA to ribosomal complex

58. Find out primary bile acids from the following pair :
(A) Cholic acid, chenodeoxycholic acid
(B) Deoxycholic acid, lithocholic acid
(C) Glycocholic acid, glcochenodeoxycholic acid
(D) Taurocholic acid, taurochenodeoxycholic acid

59. Which of the following enzymes do not require template for the synthesis of DNA and RNA ?
(A) DNA polymerase 5
(B) RNA pol 1
(C) reverse transcriptase
(D) terminal deoxy nucleotidyl transferase

60. A restriction fragment obtained with a type II endonuclease was subjected to Maxam-Gilbert sequencing which results as shown in the autoradiogram below. What will be the sequence of fragmented DNA ?

G	A + G	C	C + T
–	–		
		–	–
			–
	–		
	–		
			–
–	–		
		–	–
			–
	–		
–	–		
		–	–
			–
	–		
		–	–

(A) 5^{I}CATCGATCGTAATCG 3^{I}
(B) 3^{I}CATCGATCGTAATCG 5^{I}
(C) 5^{I} CATCGAGCTTAATCG 3^{I}
(D) 3^{I} CATCGATCGAATTCG 5^{I}

61. Trypsin cleaves the peptidyl bond at the site of
(A) carboxyl side of arginine or lysine
(B) amino side of arginine or lysine
(C) carboxyl side of tryptophan or phenylalanine
(D) amino side of tryptophan or phenylalanine

62. To immobilise an enzyme in a durable way, Diazolation is frequently used, which of the following statement is correct for Diazolation ?
(A) Reaction occurs between the amino group of the support and the carboxyl group of the enzyme
(B) A bifunctional or multi-functional reagent used to create bonding between the amino group of the support and the amino group of the enzyme
(C) Bonding between the amino group of the support and a tryosyl or histidyl group of the enzyme
(D) Use of cyanogen bromide, which can be applied to a support containing glycol groups

63. Which of the following is not used as crosslinking agent for immobilization of enzymes ?
(A) Hexamethylene di isocyanate
(B) Diazonium salt
(C) N-N` polymethyelene bis iodoacetinamide
(D) Cyanogen bromide

64. In industrial fermentation process, which phase of the microbes were minimised or avoided ?
(A) lag phase (B) log phase
(C) stationary phase (D) decline phase

65. An organism grows under given conditions on a given substrate with μ_{max} 0.75 h^{-1} and Ks with respect to substrate is 0.01 kg m^{-3}. What will be the growth rate of the organism under the given conditions when the substrate concentration is 0.25 kg m^{-3} ?
(A) 0.75 h^{-1} (B) 0.76 h^{-1} (C) 0.72 h^{-1} (D) 0.73 h^{-1}

66. For industrial production of vitamin B_{12} which of the following bacteria is used ?
(A) *Propionibacterium freudeureichii* (B) *Clostridium acetobutylicum*
(C) *Leuconostoc mesenteroides* (D) *Sarcina ventriculi*

67. In Entner-Doudroff pathway what are the end products of glucose ?
(A) One molecule pyruvate, one mol of ATP, $NAD(P)H_2$ and $NADH_2$
(B) Two molecule pyruvate, two mol of ATP, $NAD(P)H_2$ and $NADH_2$
(C) Two molecule pyruvate, one mol of ATP, $NAD(P)H_2$ and $NADH_2$
(D) One molecule pyruvate, two mol of ATP, $NAD(P)H_2$ and $NADH_2$

68. During the fermentation process of penicillin–G, which of the following is not added to medium ?

(A) Phenyl acetic acid (B) Phenyl acetamide

(C) β Phenyl ethylamine (D) Phenoxy acetic acid

69. Preferred method of sterilization in large scale fermentation

(A) Radiation (B) Filteration (C) Chemicals (D) Heat

70. Match the products in Column A with their corresponding product in Column B :

Column A	Column B
a. *Micromonospora purpurea*	1. Bacitracin
b. *Bacillus subtilis*	2. Polymyxin B
c. *Streptomyces aureofaciens*	3. Gentamycin
d. *Streptomyces spheroids*	4. Rifamycin
	5. Tetracyclin
	6. Novobiocin

(A) a – 3, b – 1, c – 5, d – 6 (B) a – 6, b – 4, c – 1, d – 5

(C) a – 1, b – 3, c – 6, d – 4 (D) a – 6, b – 3, c – 4, d – 1

71. In plants proline is produced from ornithine under normal condition, however under stress condition it is made directly from

(A) Aspartate (B) Glutamate (C) Glutamine (D) Lysine

72. Glyphosate resistant plants developed by the insertion of _____ genes.

(A) aroA gene (B) Glutamine synthase gene

(C) ALS gene (D) psbA gene

73. Which of the following transcription factor is involved in the expression of the cold responsive genes ?

(A) CBF1 (B) HSF (C) Bxn (D) Oct4

74. Vincristine and Vinblastine are anti cancerous drugs which are obtained from

(A) *Crocus sativus* (B) *Chrysanthemum species*

(C) *Catharanthus roseus* (D) *Atropa belladonna*

75. Elicitors are the compounds which

(A) Stimulate the production of secondary metabolites

(B) Induce somatic embryogenesis

(C) Enhance the biotransformation

(D) Induce androgenic embryos

76. Production of secondary metabolites requires the use of
(A) Protoplasts (B) Apical Meristem
(C) Axillary buds (D) Cell suspension

77. Germplasm preservation through tissue culture is
(A) Insitu conservation (B) Exsitu conservation
(C) Protected area conservation (D) Both insitu and exsitu conservation

78. In organogenesis multiple shoot production is promoted by
(A) 2,4-D (B) Abscisic acid
(C) Gibberilic acid (D) Benzyl adenine

79. Artificial seeds (synthetic seeds) are produced from somatic embryos encapsulated with
(A) Sodium carbonate (B) Sodium alginate
(C) Calcium alginate (D) Sodium nitrate

80. The rol gene present in Ri plasmid responsible for
(A) Shoot induction (B) Flower bud induction
(C) Root induction (D) Dedifferentiation

81. The functions of VirE2 protein in plants are
(A) Nuclear targetting and protection of 5^1 end of T-DNA
(B) Sensing phenolic Kinase and induction of phosphorylation
(C) Nicking and processing of T-DNA
(D) Coats the T-DNA strand protects it from degradation

82. Choose the correct statement from the following :
(A) Edible vaccines are antigens generated by bacteria
(B) Edible vaccines are pre made antibiotics that are produced in transgenic plants
(C) Edible vaccines stimulate mucosal immune system to produce secretary IgA at mucosal surface
(D) Edible vaccines cannot uncoat the calcium ion binding sites on the coat protein of the virus

83. All the statements are true regarding RFLP and RAPD except
(A) RAPD is a quick method compared to RFLP
(B) RFLP is more reliable than RAPD
(C) Species specific primers are required for RAPD
(D) Radioactive probes are not required in RAPD

84. Aquatic fern which is an excellent bio fertilizer also form symbiotic association with *Anabaena* ?
(A) *Salvinia* (B) *Marsilea* (C) *Azolla* (D) *Pteridium*

85. An advantage of organic fertilizer over inorganic fertilizer is the addition of

(A) Micronutrients to the soil (B) Humus to the soil

(C) Macronutrients to the soil (D) Phosphorus to the soil

86. Which of the following fungi is used as an insecticide ?

(A) *Beauveria bassiana* (B) *Lecanicillum Spp*

(C) *Metarhizium Spp* (D) *Aspergillus flavus*

87. Match the following :

Column A	Column B
a. *Trichoderma*	1. Bioinsecticide
b. *Plytopthera*	2. Bacteriocide
c. *Bacillus thurengenesis*	3. Biofungicide
	4. Bioherbicide

(A) a – 3, b – 2, c – 1 (B) a – 3, b – 4, c – 1

(C) a – 2, b – 3, c – 4 (D) a – 4, b – 3, c – 2

88. Reducing the mobility of a substance in an environment by employing plants through a process called

(A) Phytostimulation (B) Phytostabilization

(C) Phytoextraction (D) Phytochelation

89. Choose the correct statement regarding the *Genobacter metalreducens*.

(A) It is rod shaped, Gram+ve, removes uranium.

(B) It is round shaped, Gram+ve, removes iron.

(C) It is round shaped, Gram–ve, removes uranium.

(D) It is rod shaped, Gram–ve, removes uranium.

90. Which of the following is used as a surfactant for enhancing oil recovery ?

(A) Xanthan gum (B) furfural (C) Lignins (D) Polyacrylamide

91. Once the sequences are obtained from next generation sequencing experiment, what is the first thing to do ?

(A) Perform a bioinformatics analysis of your data

(B) Publish your results

(C) Further investigate the sequence of interest

(D) Check data using a different method

92. SWISS PROT is related to

(A) Portable data (B) Swiss bank data

(C) Sequence data bank (D) Sequence sequence data

93. Clustal W :
(A) Multiple sequence alignment
(B) Protein secondary structure prediction tool
(C) Data retrieving tool
(D) Nucleic acid sequencing tool

94. PRINTS are software used for
(A) Detection of genes from genome
(B) Detection of T–RNA gene
(C) Prediction of function of new gene
(D) Identification of functional motifs/domains of proteins

95. An example of homology and similarity tool
(A) PROSPECT (B) EMBOSS (C) RASMOL (D) BLAST

96. Deposition of c DNA into inert structure is
(A) DNA fingerprinting (B) DNA polymerase
(C) DNA probes (D) DNA microarrays

97. CpG islands and codon bias are used in eukaryotic genomics to
(A) identify open reading frames
(B) differentiate between eukaryotic and prokaryotic DNA sequence
(C) find regulatory sequences
(D) look for DNA binding domains

98. The first bioinformatics database was created by
(A) Richard Durbans (B) Dayhoff
(C) Michael Dunn (D) Pearson

99. If you were using proteomics to find out the causes of muscle disorder, which technique is preferred ?
(A) Creating genomic library
(B) Sequencing the gene responsible for disorder
(C) Determining which environmental factor influences the expression of your gene of interest annotating the gene sequence
(D) Developing physical map from genomic clones

100. If the E value is 3 for the search in BLAST. This means
(A) 3 proteins in the database have same sequence as its protein
(B) Chance of similarities arose due to chance is over in 10^3
(C) There would be 3 matches that are good in database of this size by chance alone
(D) The match in aa^- sequence is perfect except for aa^- at 3 position

101. A BLAST search of DNA sequence identifies as EXON 1 gene, an EXON gene is
(A) A section of eukaryotic gene that is translated into protein
(B) A section of eukaryotic gene that is not translated into protein
(C) A regulatory sequence that turns gene on and off
(D) DNA that has no genetic role but does maintain the physical structure of chromosome

102. The complexity of organisms increases all of the characteristics, except
(A) The gene density increases (B) The number of introns increases
(C) Gene size increases (D) An increase in number of chromosomes

103. Excess CO_2 suppress cell growth and productivity by
(A) Altering pH of the medium
(B) Inhibiting Respiration
(C) Altering intracellular pH by diffusing across cell membrane
(D) (B) and (C)

104. For profiling mammalian cells the buffering capacity of the medium is increased by
(A) $NaHCO_3$ (B) K_2HPO_4 (C) $CaCO_3$ (D) $MgSO_4$

105. In monolayer cultures cells preferentially adhere to the surfaces with
(A) Positively charged (B) Negatively charged
(C) Neutrally charged (D) Double positively charged

106. In monolayer cultures, Gap junctions allow intra cellular exchange of ions and molecules with
(A) 1100 D (B) 900 D (C) 500 D (D) 2000 D

107. Osmolarity of human plasma is about
(A) 290 mosmol/kg (B) 310 mosmol/kg
(C) 410 mosmol/kg (D) 180 mosmol/kg

108. Which of the following statement is incorrect regarding HAT medium ?
(A) HAT medium is a selective medium
(B) Aminopterin in the HAT medium blocks denovo pathway of nucleotide synthesis
(C) Salvage pathway requires aminopterin and thymidine
(D) Hypoxanthine is converted to guanine by HGPRT enzyme

109. The most recent method for screening large synthetic antibody libraries
(A) ELISA (B) Phage display (C) Bio display (D) RIA

110. Choose the recombinant product which is used in treatment of acute myocardial infraction.
(A) Lepirudin (B) Interferron B (C) Alteplase (D) Filgrastim

111. Tumour cells can grow in suspension or in a semi solid agar gel because of
(A) loss of contact inhibition (B) high telomerase activity
(C) reduced levels of Glycolysis (D) increased levels of blood circulation

112. BRAC 1 gene involved in the occurrence of breast cancer, It is a
(A) Tumour suppressor gene (B) Onco gene
(C) DNA repair gene (D) Structural gene

113. Two homeodomain transcription factors which are the first proteins identified as essential for both early embryo development and pluripotency maintenance in embryonic stem cells
(A) TRA-1-60, TRA-1-81 (B) CD 349, frizzled-9
(C) SSEA-1, SSEA-4 (D) Oct-4, Nanog

114. Which of the following interleukin is required for the development of basophils from hematopoietic stem cells
(A) IL-3 (B) IL-12 (C) IL-1 (D) IL-9

115. COS cell line is
(A) Cohesive end site of phage Lambda
(B) Derivative of permissive CV-1 monkey cell line
(C) Cohesive initial stage of phage Lambda
(D) Derivative of non permissive CV-1 monkey cell line

116. When heated above the melting point, sucrose forms a brown substance called
(A) Monellin (B) Caramel (C) Saccharin (D) Alitame

117. Antibiotic that blocks e^- transfer from Cyt b to Cyt c in oxidative phosphorylation
(A) Antimycin A (B) Streptomycin D
(C) Novobiocin (D) Erythromycin

118. Human DNA contains 40% GC content, what will be the melting temperature ?
(A) 80.3 °C (B) 90.3 °C (C) 85.3 °C (D) 92.5 °C

119. The transcription of ribosomal RNA gene cluster by RNA Pol I in the nucleus generates
(A) 55 S Pre r RNA transcript (B) 28 S Pre r RNA transcript
(C) 18 S Pre r RNA transcript (D) 45 S Pre r RNA transcript

120. Transgenic sheep developed by the insertion of
(A) α-1 antitrypsin (B) Tissue plasminogen activator
(C) Interleukin-2 (D) K-Casein

SPACE FOR ROUGH WORK