

**UNIVERSITY OF CALICUT**  
**MODEL QUESTION PAPER - 2020**  
**Common Entrance Examination for Admission to**  
**M. Sc. Applied Plant Science / M. Sc. Biotechnology**

**Instructions to Candidates**

- I. For candidates with a single option of Applied Plant Science alone  
Part A + B – 1 hour 45 minutes
  - II. For candidates with a single option of Biotechnology alone  
Part A + C – 1 hour 45 minutes
  - III. For candidates with both options of Applied Plant Science and option of Biotechnology.  
First 1 hour 45 minutes attempt Part A + B as per their option  
Next 1 hour 15 minutes attempt Part C alone
  - IV. Students will not be permitted to take the question papers after the examination
- .....

**PART A - COMMON PAPER**

**Max Marks 25**

Attempt all 25 questions. All questions carry 1 mark each. 1/3 mark will be deducted for each wrong answer.

1. Find the odd one
  - a) Glycosylation
  - b) Proteolysis
  - c) Splicing
  - d) Phosphorylation
  
2. Secondary lymphoid organ
  - a) Bone marrow
  - b) Lymph node
  - c) Thymus
  - d) Bursa of fabricius
  
3. VDRL is a diagnostic test for ..... infection.
  - a) Salmonella
  - b) Syphilis
  - c) Human Pappiloma Virus
  - d) Candida
  
4. Competitive inhibitors will have ..... to that of normal reaction without the inhibitor.
  - a) Same Km Value
  - b) Same Vmax value
  - c) Same Km and same V max Values
  - d) Different Km and same V max Values
  
5. The primary function of baffles in the fermentor is
  - a) Prevent vortex formation
  - b) For increase the volumetric air flow in the fermenter
  - c) Increase the feed rate of media
  - d) Prevent the form formation
  
6. Rotating biological contactors are used in
  - a) Aerobic water treatment process
  - b) Alcoholic fermentation process

- c) Cheese making
  - d) In penicillin production
7. Technique used for the structural studies of protein
- a) Electrophoresis
  - b) X-ray crystallography
  - c) Ultra centrifugation
  - d) Peptide fingerprinting
8. The KDEL sequence found on luminal proteins of the ER is responsible for
- a) Translocation of proteins into the ER lumen
  - b) Recognition by signal peptidase of the signal sequence
  - c) Retrieval of ER luminal proteins from the golgi
  - d) Insertion of proteins into the membrane of ER
9. The following process requires cholesterol except:
- a) Steroid hormone synthesis
  - b) Thyroid hormone synthesis
  - c) Membrane fluidity
  - d) Synthesis of bile
10. Which of the following enzyme is activated to facilitate the uptake of triglycerols in adipose tissues by insulin enhancement?
- a) Lipoprotein lipase
  - b) Catalase
  - c) Esterase
  - d) Hormone-sensitive lipase
11. Which of the following RNA serves in the regulatory functions including splicing and gene silencing?
- a) mRNA
  - b) tRNA
  - c) small RNA
  - d) rRNA
12. Which of the following is NOT the positive regulator of Lac operon
- a) Lactose
  - b) Allolactose
  - c) cAMP
  - d) Glucose
13. Which of the virus is commonly attributed to the initiation of cervical carcinoma?
- a) HPV
  - b) EBV
  - c) HSV
  - d) HBV
14. In an experiment, IQ scores are approximately normally distributed with a mean of 100 and standard deviation of 15, the proportion of people with IQs above 130 is
- a) 95%
  - b) 2.5%

- c) 15%
  - d) 5%
15. Ribosome biosynthesis takes place in
- a) Cytoplasm
  - b) Nucleolus
  - c) Mitochondria
  - d) None of these
16.  $F_0$ - $F_1$  particles are present in
- a) Endoplasmic reticulum
  - b) Golgi complex
  - c) Mitochondria
  - d) None of these
17. The technique used to separate DNA fragments is
- a) Northern blotting
  - b) Southern blotting
  - c) Eastern blotting
  - d) Western blotting
18. Which level of protein structure is represented by the alpha-helix and beta-sheet?
- a) Primary
  - b) Secondary
  - c) Tertiary
  - d) Quaternary
19. Which of the following vitamins has cobalt as a constituent?
- a) Vitamin B<sub>1</sub>
  - b) Vitamin B<sub>2</sub>
  - c) Vitamin B<sub>6</sub>
  - d) Vitamin B<sub>12</sub>
20. Which among the following is a protein sequence data base?
- a) PIR
  - b) EMBL
  - c) DDBJ
  - d) Gen bank
21. Concentration of a solution equal to the number of gram equivalents of the solute per liter of the solution is
- a) Normality
  - b) Molarity
  - c) Molality
  - d) None of these
22. The voluntary program used to label green computing is
- a) Energy star
  - b) Energy bar
  - c) Energy Premium

- d) Energy Basic
23. Monosomy is associated with
- a) Down syndrome
  - b) Turner syndrome
  - c) Retinoblastoma
  - d) Leukemia
24. Practice of taking someone else's work or ideas and using as one's own is
- a) Fraudism
  - b) Plagiarism
  - c) Pilfering
  - d) None of these
25. Which among the following is an imino acid
- a) Glycine
  - b) Proline
  - c) Arginine
  - d) Glutamine

### PART B – APPLIED PLANT SCIENCE

**Time: 1½ Hour**

**Max Marks 75**

Attempt all 75 questions. All questions carry 1 mark each. 1 mark will be deducted for 3 wrong answers.

26. Cyanophyceae is separated from algae because it is
- a) Eukaryotic
  - b) Unicellular
  - c) Prokaryotic
  - d) Filamentous
27. Plants which are not differentiated into roots, stem and leaves are grouped under
- a) Gymnosperms
  - b) Pteridophytes
  - c) Thallophytes
  - d) Spermatophytes
28. Sargasso sea is named after an algae *Sargassum* which is a
- a) Green algae
  - b) Brown algae
  - c) Red algae
  - d) Blue green algae
29. Liverworts belong to
- a) Gymnosperms
  - b) Pteridophytes
  - c) Bryophyte
  - d) Algae

30. Which group of plant constitute the lower bryophytes

- a) Liverworts
- b) Mosses
- c) Anthocerotales
- d) Jungermaniales

31. A specialised organ of the sporophyte for attachment to the gametophyte is called

- a) Stalk
- b) Foot
- c) Apophysis
- d) Root

32. Which is known as Horsetails?

- a) *Equisetum*
- b) *Psilotum*
- c) *Pteris*
- d) *Adiantum*

33. Spore bearing leaf is called

- a) sorus
- b) indusium
- c) ramentum
- d) sporophyll

34. Circinate vernation is found in

- a) cycas
- b) fern
- c) both a and b
- d) none of these

35. The needles of *Pinus* and leaves of *Cycas* are similar, because both show

- a) Hydrophytic features
- b) Xerophytic features
- c) Psammophytic features
- d) None of these

36. Gymnosperm differ from angiosperm

- a) having seeds
- b) having fruits
- c) having naked ovules
- d) none of these

37. Coralloid roots are found in

- a) *Cycas*
- b) *Pinus*
- c) *Dryopteris*
- d) *Lycopodium*

38. Puffball belongs to the genera

- a) Nidularia
- b) Lycoperdon
- c) Cyathus
- d) Aspergillus

39. Cell containing many nuclei are called:

- a) Coenocyte
- b) Hyphae
- c) Mycelium
- d) Sporophore

40. Damping off is caused by:

- a) Albugo
- b) Pythium
- c) Penicillium
- d) Plasmidiophora

41. The fungal partner in lichen is called mycobiont whereas algal partner is called

- a) glycobiont
- b) algobiont
- c) phycobiont
- d) often referred as algal partner

42. The study of lichens is called

- a) phycology
- b) mycology
- c) lichology
- d) lichenology

43. Usnea is a

- a) foliose lichen
- b) fruticose lichen
- c) crustose lichen
- d) filamentous lichen

44. Coffee rust is caused by

- a) *Puccinia graminis*
- b) *Cephaleuros coffeae*
- c) *Helminthosporium coffeae*
- d) *Hemileia vastatrix*

45. Name the organism that causes quick wilt of black pepper.

- a) *Phytophthora*
- b) *Alternaria*
- c) *Pyricularia*
- d) *Plasmopara*

46. Foot rot of papaya is caused by:

- a) *Pythium debaryanum*
- b) *Pythium aphanidermatum*
- c) *Peronospora parasitica*
- d) *Albugo candida*

47. Collenchyma are characterized by the presence of

- a) elongated cells with deposits of cellulose and pectin all over the wall
- b) isodiametric cells with deposits of cellulose and pectin at the corners
- c) elongated cells with thickening at the corners
- d) isodiametric cells with thickening all over the wall

48. The waxy substance associated with the wall of cork cells is

- a) Cutin
- b) Lignin
- c) Hemicellulose
- d) Suberin

49. Vascular cambium produces

- (a) primary xylem and primary phloem
- (b) secondary xylem and secondary phloem
- (c) primary xylem and secondary phloem
- (d) secondary xylem and primary phloem

50. Opening of pollen sac is termed

- a) Archosporium
- b) Stomium
- c) Tapetum
- d) None of these

51. Double fertilization is characteristic of

- a) Gymnosperms
- b) Angiosperms
- c) Monocots
- d) Bryophytes

52. Porogamy is

- a) Fertilization in which pollen tube enters the ovule through integument
- b) Fertilization without pollen grain
- c) Fertilization in which pollen tube enters the ovule through chalaza
- d) Fertilization in which pollen tube enters the ovule through micropyle

53. Pollination is best defined as

- a) Germination of pollen grains
- b) Visiting flowers by insects
- c) Transfer of pollen from anther to stigma
- d) Growth of pollen tube in ovule

54. The exine of a pollen grain is made of

- a) Pectin and cellulose
- b) sporopollenin
- c) pollenkit
- d) lignocellulose

55. Wind pollinated plants differ from insect pollinated plants in having

- a) small petals and sticky pollen
- b) small coloured petals and heavy pollen
- c) Coloured petal and large pollens
- d) No petals and light pollen

56. International Rice Research Institute is located at

- a) Philippines
- b) London
- c) Newyork
- d) Canada

57. The rice variety PTB-10 is obtained from

- a) Selection
- b) Hybridisation
- c) Introduction
- d) Mutation breeding

58. The irrigation technique mimicking rain is

- a) Surface irrigation
- b) Drip irrigation
- c) Sprinkler irrigation
- d) None of these

59. Organisms inhabiting a common environment belong to the same

- a) Community
- b) Species
- c) Genus
- d) Population

60. MAB stands for

- a) Man and Biosphere
- b) Man, antibiotics and bacteria
- c) Man and biotic community
- d) Mayer, Anderson and Bisby

61. Green House effect is caused by:

- a) CO
- b) CO<sub>2</sub>
- c) H<sub>2</sub>
- d) CFC

62. The bacteria involved in symbiotic nitrogen fixation are:

- a) Clostridium
- b) Rhizobium
- c) Nitromonas
- d) None

63. A biological community together with the associated abiotic environment is:

- a) Biomes
- b) population
- c) community
- d) Ecosystem

64. The number of individuals of species in a unit area is called:

- a) Abundance
- b) Density
- c) Frequency
- d) Cover

65. Which of the following species of trees were suited for building ships and railways?

- a) Sal and Semur
- b) Teak and Mahogany
- c) Rosewood and Sal
- d) Teak and Sal

66. Jeevani is

- a) Carminative
- b) Name of an ethnomedicine
- c) a weed
- d) an oil seed crop

67. Branch of ethnobotany dealing with mushrooms is

- a) Ethnofungal Science
- b) Ethnofungal Biology
- c) Ethnomycology
- d) None of these

68. Beetrot is a

- a) Napiform root
- b) Fusiform root
- c) Conical root
- d) Adventitious root

69. Avicennia is an example for

- a) Taproot modification
- b) Aerial root modification
- c) Stilt root
- d) Pneumatophores

70. In *Ficus* the inflorescence is termed as

- a) Hypanthodium
- b) Cyathium
- c) Capitulum
- d) Verticillaster

71. Syngenesious anthers and epipetalous stamens are found in

- a) Liliaceae
- b) Malvaceae
- c) Solanaceae
- d) Asteraceae

72. TBGRI is in

- a) Kerala
- b) Tamilnadu
- c) Karnataka
- d) Andhra Pradesh

73. Linnaeus is credited with introducing:

- a) The concept of inheritance
- b) Law of limiting factor
- c) Theory of heredity
- d) Binomial nomenclature

74. Number of sepals in family Fabaceae is:

- a) 3
- b) 4
- c) 5
- d) 6

75. Fruit in the family Poaceae is:

- a) Capsule
- b) Caryopsis
- c) Regina
- d) Carcerulus

76. Jute is obtained from

- a) *Corchorus*
- b) *Cannabis*
- c) *Linum*
- d) *Crotalaria*

77. The plant for the source of the drug, Quinine is

- a) *Cinchona*
- b) *Ephedra*
- c) *Atropa*
- d) None of these

78. Which is known as finger millet?

- a) *Hordeum vulgare*

- b) *Eleusine coracana*
- c) *Avena sativa*
- d) None of these

79. Branch of science that deals with finding the age of wood is

- a) Dendrobiology
- b) Dendrochronology
- c) Phytochronology
- d) None of these

80. Famous Indian Palaeontologist is

- a) M. O. P. Iyengar
- b) Birbal Sahni
- c) B. P. Pandey
- d) None of these

81. A fossil Gymnosperm is

- a) Rhynia
- b) Calamites
- c) Williamsonia
- d) Lepidodendron

82. Which of the following statements is NOT correct?

- a) Stomata are present in mosses and hornworts but absent in liverworts.
- b) Only the lycophytes have microphylls and almost all other vascular plants have megaphylls.
- c) Monocot pollen grains have three opening whereas eudicot pollen grains have one opening
- d) Monocot have fibrous root system whereas eudicots have taproot.

83. Carnoy's solution is a mixture of

- a) Chromic acid & glacial acetic acid
- b) Et OH, glacial acetic acid & formalin
- c) Et OH, glacial acetic acid & chloroform
- d) Et OH, acetic acid & distilled water

84. The sectioning of woody plant materials is made through

- a) Rotary microtome
- b) Sledge microtome
- c) Cryotome
- d) Rocking microtome

85. Consider the following statements: Hybrid plants can show

- a) Sterility
- b) Mosaicism
- c) Crossing over
- d) Vigour

86. Gamma garden is used for

- a) Growing plantlet produced by tissue culture

- b) Eradicating pathogens from infecting plants
- c) Growing genetically engineered plants on trial basis
- d) Mutation breeding for crop improvement

87. Which among the following is the principal pigment in photosynthesis

- a) Chlorophyll a
- b) Chlorophyll b
- c) Carotene
- d) Xanthophyll

88. Which among the following exhibit seismonastic movement

- a) *Enterolobium saman*
- b) *Phaseolus vulgaris*
- c) *Mimosa pudica*
- d) None of these

89. One of the methods of breaking dormancy is

- a) Mechanical scarification
- b) Vernalization
- c) Etiolation
- d) Phosphorylation

90. The most abundant protein in the biosphere is

- a) Collagen
- b) Rubisco
- c) r-protein
- d) None of the above

91. Which hormone is involved in stomatal closure

- a) Abscisic acid
- b) IAA
- c) GA3
- d) Ethylene

92. Which among the following is the transport form of sugar?

- a) Glucose
- b) Sucrose
- c) Lactose
- d) Fructose

93. The nodule forming bacteria are:

- a) Azotobacter
- b) Nitrobacter
- c) Clostridium
- d) Rhizobium

94. The property of *Taq* polymerase that makes it suitable for PCR is

- a) Low molecular weight

- b) Solubility in water
- c) Heat stability
- d) Easy availability

95. Restriction endonucleases react with DNA by

- a) cleaving at recognition sequences
- b) removing methyl groups from DNA
- c) denaturing the entire DNA
- d) adding methyl groups to DNA

96. A fluorescent dye that is used to localize DNA in gel electrophoresis is

- a) Acridine orange
- b) Fluorescein isothiocyanate
- c) Rhodamine B
- d) Ethyidium bromide

97. Which among the following is a rooting hormone?

- a) Zeatin
- b) IAA
- c) GA
- d) ABA

98. Which one of the following compounds is used in protoplast fusion

- a) Sorbitol
- b) Polyethylene glycol
- c) Dinitrophenol
- d) Mannitol

99. Mitochondrial genome encodes tRNAs, \_\_\_\_\_ and polypeptides involved in \_\_\_\_\_

- a) mRNAs, oxidative phosphorylation
- b) rRNAs, oxidative phosphorylation
- c) rRNAs, reductive phosphorylation
- d) mRNAs, reductive phosphorylation

100. For Chlorella, which method is used for DNA uptake?

- a) Electroporation
- b) Direct uptake of naked DNA
- c) Conjugation
- d) Chemically induced uptake by protoplast

**PART C - BIOTECHNOLOGY**

**Time: 1½ Hour**

**Max Marks 75**

Attempt **all** 75 questions. All questions carry **1** mark each. **1/3** mark will be deducted for each wrong answer.

26. In electrophoretic separation of biomolecules is based on  
(A) Electrical charge (B) Mass of the molecule  
(C) Both A and B (D) S value of substance
27. Pick out the odd one :  
(A) UAG. (B) UGA.  
(C) UAA. (D) AUG.
28. Pick out the odd one :  
(A) Lysosome. (B) Liposome.  
(C) Peroxisome. (D) Glyoxysome.
29. ATP synthase is present in :  
(A) Cytoplasm. (B) Nucleus.  
(C) Mitochondria. (D) Plasma membrane.
30. Which of these is used for genetic mapping ?  
(A) Conjugation. (B) Transduction.  
(C) Hfr. (D) All of these.
31. Lambda phage  
(A) Is a lytic phage (B) Is a lysogenic phage  
(C) Can form both turbid plaque and clear plaque (D) have all the above properties
32. In an autoclave, at 15 pounds per square inch, water boils at :  
(A) 100 °C. (B) 110 °C.  
(C) 121° C. (D) 160° C.
33. Ribosomes are produced in the  
(A) Cytoplasm. (B) ER.  
(C) Golgi complex. (D) Nucleolus.
34. The number of cell types found in the human body is about :  
(A) 50. (B) 100.  
(C) 200. (D) 500.
35. Two allelic genes are located on :  
(A) The same chromosome. (B) Two homologous chromosomes.  
(C) Two non-homologous chromosomes. (D) Any two chromosomes.
36. Pick out the wrong statement :  
(A) 50S subunit contains 5S rRNA. (B) 60S subunit contains 5S rRNA.  
(C) 50S subunit contains 5.8S rRNA. (D) 60S subunit contains 5.8S rRNA.
37. Apical Meristem culture is used for  
(A) Generating haploid plants  
(B) Generating embryo culture  
(C) Anther culture  
(D) Generate virus free plants.

38. Cancers arising from epithelial cells are called :  
 (A) Sarcoma. (B) Carcinoma.  
 (C) Myeloma. (D) Adenoma.
39. Bioremediation includes :  
 (A) Biotransformation. (B) Biodegradation.  
 (C) Mineralization . (D) All of the above.
40. If an enzyme is saturated with substrate, the most effective way to obtain an even faster yield of products would be :  
 (A) Add more of the enzyme. (B) Add more of the substrate.  
 (C) Add an allosteric inhibitor. (D) Add a non competitive inhibitor.
41. Enzymes are classified into :  
 (A) Five groups. (B) Six groups.  
 (C) Eight groups. (D) Seven groups.
42. Primase is  
 (A) A DNA polymerase. (B) Reverse transcriptase  
 (C) An RNA polymerase. (D) None of the above.
43. Core histones contain  
 (A) H1, H2, H3 and H4. (B) H1, H2A, H2B, and H2C.  
 (C) H2A, H2B, H3, and H4. (D) H2A, H3A, H4A and H4B.
44. Which of the following is not a secondary lymphoid tissue ?  
 (A) Lymph node. (B) Spleen.  
 (C) Tonsils. (D) Thymus.
45. Vector derived the following is used for single strand DNA generation ?  
 (A) pBR 322. (B) pUC 18.  
 (D) pUC 19. (C) pM13.
46. Apical dominance in plants are produced by  
 (A) Gibberellins (B) Auxin  
 (C) Cytokinin (D) Ethylene
47. Common food poisoning microbes are :  
 (A) *Clostridium and Salmonella.* (B) *E. coli and Salmonella.*  
 (B) *Clostridium and E. coli.* (D) *Clostridium and Streptococcus*
48. Leaves appear green because they :  
 (A) Absorb green light. (B) Reflect green light.  
 (C) Absorb and reflect green light. (D) None of these.
49. Deamination of cytosine generates :  
 (A) Thymine. (B) Guanine.  
 (C) Adenine. (D) Uracil.
50. Well known attenuation controlled operon is  
 (A) Tryptophan, (B) Galactose  
 (C) Arabinose (D) X-gal

51. Chaperones are proteins which help in :  
 (A) Protein degradation. (B) Protein folding.  
 (C) Protein misfolding. (D) Protein synthesis
52. Northern blotting is concerned with one of the following :  
 (A) Proteins. (B) DNA.  
 (C) RNA. (D) Lipids
53. DNA fingerprinting is based on :  
 (A) Satellite DNA (B) Single copy genes.  
 (C) Moderately repeated sequences. (D) rDNA.
54. Automated DNA sequencing is based on the same principle as that involved in  
 (A) Maxam and Gilbert's method. (B) Sanger's method.  
 (C) Chemical sequencing. (D) None of these.
38. Down's syndrome occurs due to :  
 (A) Non-disjunction of chromosomes. (B) Sex-linked inheritance.  
 (C) Linkage of genes. (D) Chromosomal aberration
55. Lac operon is :  
 (A) Negatively controlled. (B) Positively controlled.  
 (C) Under both positive and negative types of control. (D) None of these.
56. Which of the following names is associated with PCR ?  
 (A) E.Southern. (B) Cary B Mullis.  
 (C) Cesar Milstein. (D) Leyland H
57. Test cross involves :  
 (A) Crossing between two dominant genotypes.  
 (B) Crossing between two recessive genotypes.  
 (C) Crossing the F1 hybrid with a double recessive genotype.  
 (D) Crossing between two F1 hybrids.
58. Crossing over occurs in :  
 (A) Zygotene. (B) Pachytene.  
 (C) Diplotene. (D) Metaphase
59. Down syndrome is :  
 (A) Autosomal. (B) Sex linked.  
 (C) Viral. (D) Bacterial
60. Which of the following is a metabolic disorder?  
 (A) Sickle cell anemia. (B) Phenylketonuria.  
 (C) Thalassemia. (D) Jaundice
61. Limit of resolution of human eye is :  
 (A) 0.1 mm. (B) 0.018 A°.  
 (C) 5 mm. (D) 1 mm.
62. The light and heavy chains of an IgG molecule are held to each other by  
 (A) Covalent bonds. (B) Non-covalent bonds.  
 (C) Both. (D) Neither.

63. Which of the following is a water soluble vitamin ?  
 (A) Vitamin E. (B) Vitamin K.  
 (C) Vitamin A. (D) Vitamin B.
64. The resolving power of light microscope is :  
 (A) 0.2 (B) 1.1.  
 (C) 10 (C) 20
65. Which of the following is the actual replicase in E. coli ?  
 (A) DNA Pol. (B) DNA Pol II.  
 (C) DNA Pol III. (D) None of these
66. Liposomes are :  
 (A) Found in the cytoplasm. (B) Present in the plant cells.  
 (C) Present in the animal cells. (D) Artificial synthetic vesicles.
67. Which is the correct order of events ?  
 (A) Leptotene — zygotene — pachytene — diplotene.  
 (B) Diplotene — zygotene — pachytene — Leptotene.  
 (C) Leptotene — zygotene - diplotene - pachytene.  
 (D) Leptotene — pachytene - zygotene — diplotene.
68. Name associated with cell membrane structure :  
 (A) Robertson. (B) Danielli.  
 (C) Singer. (D) All of these.
69. Filariasis is caused by :  
 (A) Taenia solium. (B) Fasciola hepatica.  
 (C) Ascaris lumbricoides. (D) Wuchereria bancrofti.
70. Names associated with pBR322 :  
 (A) Boyer and Robert. (B) Roger and Brown.  
 (C) Bolivar and Rodriguez. (D) Berger and Russell.
71. If starch containing substrates are used for ethanol production, yeast strain can't be used directly because :  
 (A) It doesn't contain amylases to hydrolyze starch.  
 (B) Starch is not a suitable substrate for the production of ethanol.  
 (C) It is converted to pentose sugar.  
 (D) None of the above.
72. What are different substrates used for ethanol production ?  
 (A) Starch containing substrate.  
 (B) Juices from sugarcane or molasses or sugar beet.  
 (C) Waste product from wood or processed wood.  
 (D) All of the above
73. Ethanol is produced by :  
 (A) Continuous fermentation. (B) Batch fermentation.  
 (C) Both (A) and (B). (D) None of these.

74. *Bacillus thuringiensis* is associated with :  
(A) Polio vaccines. (B) Cry proteins.  
(C) Tissue culture. (D) Nitrogen fixation.
75. Which of the following techniques was carried out first historically ?  
(A) DNA sequencing. (B) RNA sequencing .  
(C) Protein sequencing. (D) Genome sequencing.
76. Prions contain :  
(A) DNA. (B) RNA.  
(C) Protein. (D) DNA + protein.
77. Naturally occurring DNA exhibits :  
(A) Negative supercoiling. (B) Positive supercoiling.  
(C) No supercoiling. (D) None of these.
78. Which of the following does not require staining for observation of cells ?  
(A) Electron microscopy. (B) Confocal microscopy.  
(C) Phase-contrast microscopy. (D) All of the above.
79. Which of the following names is associated with Reverse Transcriptase ?  
(A) Watson and Crick.  
(B) Nirenberg and Khurana.  
(C) Paul Berg and Stanley cohen.  
(D) Temin and Baltimore.
80. Which form of DNA is normally found in cells  
(A) A-DNA (B) B-DNA (C) C-DNA (D) Z-DNA
81. Which of the following is associated with blue-white selection of recombinant clones ?  
(A) IPTG. (B) X-gal.  
(C) Beta-galactosidase. (D) All of these.
82. Cos sites of cosmids is derived from the phage :  
(A) M13. (B) T4.  
(C) Lambda. (D) All of these.
83. Transpositional DNA recombination involves :  
(A) Homologous recombination.  
(B) NHEJ recombination.  
(C) Site-specific recombination.  
(D) None of these.
84. Klenow fragment is part of :  
(A) RNA polymerase.  
(B) DNA ligase  
(C) Restriction endonuclease.  
(D) DNA polymerase
85. First human gene therapy is associated with :  
(A) Cystic fibrosis. (B) GFP.  
(C) Adenosine deaminase. (D) Alzheimers

86. Cyclins proteins are  
 (A) Regulatory (B) Enzymatic  
 (C) Membrane bound (D) Extracellular
87. Dilution rate  $D$  in a continuous fermentation process is calculated by flow rate  $F$  and Volume of the fermentor  $V$  using the formulae  
 (A)  $D = F$  (B)  $D = F/V$  (C)  $D = V/F$  (D)  $D = V$
88. Baffles are used in fermentor to  
 (A) Prevent forming (B) Aerate  
 (C) Prevent Vortex formation (D) Measure pH of the media
89. Efficiency of enzyme for its catalytic action can be better represented by  
 (A)  $K_m$  (B)  $K_m/V_{max}$  (C)  $V_{max}$  (D)  $V_{max}/K_m$
90. Activation of complement pathway happens by  
 (A) Classical pathway (B) Alternative pathway  
 (C) Lectin pathway (D) All the above
91. Primary Immune response is of -----type  
 (A) IgG (B) IgM (C) IgD (D) IgE
92. Sour taste of vinegar is due to  
 (A) Citric acid (B) Tartaric acid (C) Acetic acid (D) Lactic acid
93. Chlorophyll contains  
 (A) Fe (B) Mg (C) Mn (D) K
94. Widal test is a  
 (A) Precipitation test (B) Agglutination test  
 (C) Flocculation test (D) ELISA test
95. Long stretches of DNA can be separated by  
 (A) MALDI-TOF (B) FACS  
 (C) Pulse field gel electrophoresis (D) DNA Autoradiogram
96. Endogenous antigens are generally presented by  
 (A) Class I MHC (B) Class II MHC  
 (C) Class III MHC (D) Class IV MHC
97. Find the odd one  
 (A) Cellulose (B) Chitin  
 (C) Peptidoglycan (D) Starch
98. Ornithin and citruline for urea cycle are derivative from  
 (A) Cysteine (B) Lysine  
 (C) Arginine (D) Glutamic acid
99. Acid fast staining is done for  
 (A) E. Coli (B) Mycobacterium leprae  
 (C) Streptococcus pneumonia (D) Staphylococcus aureus
100. Fluidised bed reactor can also considered as  
 (A) CSTR (B) Packed bed reactor  
 (C) Air lift fermentors (D) Batch reactor