Roll. No. .....

O.M.R. Serial No. | | | | | | | | |

Question Booklet Number

08

B.Sc. (PART-III) EXAMINATION, 2021

BIOTECHNOLOGY

[PAPER : Third (BBT-303)]

(Medical Biotechnology)

Paper ID		
6	0	3

Question Booklet Series
C

Time : 1 : 30 Hours **Max. Marks : 150**

Instructions to the Examinee :

1. Do not open this Booklet untill you are told to do so.
2. Candidates should fill their roll number, subject and series of question booklet details correctly, otherwise, in case of any discrepancy in the evaluation, it will be the responsibility of the examinee himself.
3. There are 100 questions in the booklet. Examinee is required to answer only 75 questions in the OMR Answer Sheet provided. Four alternative answer to each question are given below the question, out of these four only one answer is correct. The answer which you think is correct or most appropriate, completely fill in the circle containing its letter in your answer sheet (O.M.R. Answer Sheet) with black or blue ball point pen.

परीक्षार्थियों के लिए निर्देश :

1. जब तक कहा न जाये, इस प्रश्नपुस्तिका को न खोलें।
2. परीक्षार्थी अपने अनुक्रमांक, विषय एवं प्रश्नपुस्तिका की सिरीज का विवरण यथास्थान सही-सही भरें, अन्यथा मूल्यांकन में किसी भी प्रकार की विसंगति की दशा में उसकी जिम्मेदारी स्वयं परीक्षार्थी की होगी।
3. प्रश्न-पुस्तिका में 100 प्रश्न हैं। परीक्षार्थी को केवल 75 प्रश्नों का उत्तर दी गई OMR उत्तर-पत्रक में देना है। प्रत्येक प्रश्न के चार वैकल्पिक उत्तर प्रश्न के नीचे दिये गये हैं। इन चारों में से केवल एक ही उत्तर सही है। जिस उत्तर को आप सही या सबसे उचित समझते हैं, अपने उत्तर-पत्रक (O.M.R. Answer Sheet) में उसके अक्षर वाले वृत्त को काले या नीले बॉल प्वाइंट पेन से पूरा भर दें।

(Remaining instructions on last page) *(शेष निर्देश अन्तिम पृष्ठ पर)*

Rough Work

1. The first human protein produced through recombinant DNA technology :

(A) Insulin

(B) Erythropoietin

(C) Somatostatin

(D) Interferon

2. Before the production of recombinant insulin, the insulin for treatment of diabetes in humans wasobtained from :

(A) Healthy humans

(B) Dead human body

(C) Cows and pigs

(D) Dogs and cats

3. During recombinant insulin synthesis, the bond between insulin polypeptide and galactosidase can be removed by :

(A) Cyanogen bromide

(B) Chymotrypsin

(C) Carboxypeptidase

(D) Amylase

4. Which group of enzymes are popularly called molecular stitchers ?

(A) Restriction endonucleases

(B) Ligases

(C) RNA polymerase

(D) DNA polymerase

5. A gene for insulin hasbeen inserted into a vector for the purpose of obtaining its protein product, such vector is called :

(A) Expression vector

(B) Supression vector

(C) Storage vector for genomic library

(D) None of the above

6. Expression vectors are used for :

(A) Produce protein products

(B) Used for genomic library

(C) Used for cDNA library

(D) Used for DNA finger printing

7. Transgenic organisms are :

(A) Produced by gene transfer technology

(B) Extinct organisms

(C) Produced by traditional breeding

(D) Naturally occuring and endemic

8. Using genetic techniques in forensic science is also called :

(A) Genetic analysis

(B) Genetic fingerprinting

(C) In vitro culture

(D) Polymerase chain reaction

9. Which among the following is the most suitable vector for mammalian cells to express recombinant proteins ?

(A) Baculovirus based vectors

(B) SV 40 based vector

(C) PET system

(D) Ti plasmid based vectors

10. Complex human proteins are expressed in mammalian cells because :

(A) These are easy to culture

(B) Their culture media is not expansive

(C) Growth of mammalian cell is very fast

(D) Human proteins are processed same as their natural version

11. If a human protein is expressed in E. coli, there will be :

(A) No disulphide bond formation

(B) No proper folding of proteins

(C) No glycosylation

(D) All of the above

12. For viral vaccine production, the virus is propagated in :

(A) HAT medium

(B) Animal cells

(C) Plant cells

(D) Cell free medium

13. Which of the following techniques is used for disease diagnosis ?

(A) ELISA

(B) PCR

(C) Western Blotting

(D) All of the above

14. Molecular diagnosis of a pathogen detects :

(A) DNA and RNA

(B) Antibodies

(C) Enterotoxins

(D) Whole pathogen

15. The term biosimilar is used for :

(A) Cloned organisms

(B) Cells from similar origin

(C) In vitro produced protein or any other biologically active compound similar to its natural version

(D) Identical twins

16. Which of the following approach is used for Ligand based drug designing ?

(A) Molecular docking

(B) Pharmacophore modeling

(C) QSAR modeling

(D) Both (B) and (C)

17. Lipinski's rule of five is used for :

(A) Docking

(B) Similarity search

(C) Drug likeness

(D) Dynamics simulation

18. Test tube baby means, a baby born when :

(A) Developed in test tube

(B) Ovum is fertilized externally and there after implanted in the uterus

(C) Developed through tissue culture

(D) Developed from non-fertilized egg

19. Through amniocentesis foetal cells can be tested for detecting diseases by :

(A) DNA analysis

(B) Karyotyping

(C) Enzyme production

(D) All of the above

20. Foetal sex can be determined by examining cells from the amniotic fluid by looking for :

(A) Kinetochore

(B) Chiasmata

(C) Autosomes

(D) Barr bodies

21. Chromosome number of an organism is maintained constant because of :

(A) Independent assortment

(B) Crossing over

(C) DNA duplication

(D) Synopsis

22. Which of the following is commonly produced in animal cell cultures ?

(A) Interferon

(B) Monoclonal antibodies

(C) Vaccines

(D) All of the above

23. Recombinant proteins are :

(A) Protein synthesized in animals

(B) Protein synthesized in E. coli

(C) Protein synthesized by transgene in host cell

(D) Protein synthesized in mutated cell line

24. The production of complete animal from somatic cell of an animal is called :

(A) Gene cloning

(B) Animal cloning

(C) Cell cloning

(D) All of the above

25. Tissue transplants usually give rise :

(A) Immune response

(B) Heat shock response

(C) Uneven body temperature

(D) Syndromes

26. Tissue transplant rejection is due to :

(A) Iso enzymes

(B) HLA proteins

(C) Cell receptors

(D) All of the above

27. Active immunity may be gained by :

(A) Natural infection

(B) Vaccines

(C) Toxoids

(D) All of the above

28. The process of weaking of a pathogen for vaccine is called :

(A) Vaccination

(B) Attenuation

(C) Immunization

(D) Virulence reduction

29. The first vaccine developed by Louis Pasteur was against :

(A) Poxvirus

(B) Hepatitis virus

(C) Rabies virus

(D) HIV

30. A vaccine can be :

(A) An antigenic protein

(B) Heat killed pathogen

(C) Live attenuated pathogen

(D) All of the above

31. Vaccination is :

(A) Active immunization

(B) Passive immunization

(C) Artificial passive immunization

(D) Natural passive immunization

32. Natural humoral immune response against a pathogen bads to the production of :

(A) Monoclonal antibodies

(B) Polyclonal antibodies

(C) Both (A) and (B)

(D) None of the above

33. Hybridoma Technology was developed by :

(A) Beedle and Tautum

(B) Khorana and Nirenberg

(C) Watson and Crick

(D) Kohler and Milstein

34. Hybridomas are made by :

(A) Fusing T-cells and myeloma cells

(B) Fusing B-cells and myeloma cells

(C) Fusing T_H cells and myeloma cells

(D) Fusing Tc cells and myeloma cells

35. Bioreactors are used for :

(A) Large scale production of desired substrates using cells/microbe

(B) Large scale chemical synthesis

(C) To store viruses

(D) To kill bacteria

36. The bacterium used for gene transfer in plants is :

(A) E. coli

(B) Rhizobium

(C) Azatobacter

(D) Agrobacterium

37. cDNA, a term used in recombinant DNA technology means :

(A) Competative DNA

(B) Chemical DNA

(C) Complex DNA

(D) Complementary DNA

38. The process of introduction of foreign DNA into an animal cell is called :

(A) Transversion

(B) Transfection

(C) Conversion

(D) Inversion

39. Genes have been transfered into animals to obtain large scale production of proteins in the milk, blood etc. is called :

(A) In vivo culture

(B) Molecular farming

(C) Gene therapy

(D) Hybridoma technology

40. Transgenic animals that produce large quantity of proteins encoded by transgene. These transgenic animals can be called :

(A) Hybrids

(B) Cybrids

(C) Bioreactors

(D) Special animals

41. A segment of DNA that reads from the same forward and backward is called :

(A) Palindromic DNA

(B) Complementary DNA

(C) Plasmid DNA

(D) Copy DNA

42. The technology used for monoclonal antibody production is :

(A) Mass culture Technology

(B) Hybridoma Technology

(C) Myeloma Technology

(D) Cell Hybridization Technology

43. Monoclonal antibodies are :

(A) Homogeneous antibodies by single clone of plasma cells

(B) Heterogeneous antibodies from single clone of plasma cells

(C) Both (A) and (B)

(D) None of the above

44. In hybridoma technology, hybrid cells are selected by :

(A) MS Media

(B) HAT Media

(C) TH Media

(D) X-gal Media

45. Which of the following is made HGPRT deficient in hybridoma technology ?

(A) B-cells

(B) T-cells

(C) Hybrid cells

(D) Myeloma cells

46. Erythropoietin is produced by :

(A) Kidney

(B) Hypothalamus

(C) Pancreas

(D) Lungs

47. Erythropoietin is :

(A) Polysaccharide

(B) Triglyceride

(C) Glycoprotein

(D) Structural protein

48. Erythropoietin stimulates :

(A) RBC production

(B) WBC production

(C) Platelet production

(D) All of the above

49. Recombinant erythropoietin is used for treatment of :

(A) Polycythemia

(B) Anemia

(C) Diabetes mellitus

(D) Cancer

50. Stem cells found in the umbilical cord blood is :

(A) totipotent

(B) pluripotent

(C) omnipotent

(D) multipotent

51. Stem cells can be obtained from :

(A) Embryonic cells

(B) Nerve cells

(C) Dendritic cells

(D) Fibroblast cells

52. Which of the following therapies can be suggested for spinal cord injuries ?

(A) Gene therapy

(B) Stem cell therapy

(C) Radio therapy

(D) Ultra sonic therapy

53. Monoclonal antibodies are used for :

(A) Disease diagnosis

(B) Detection of specific type of pathogen

(C) Early detection of cancer

(D) All of the above

54. For immunization of animals, the antigen is usually injected with adjuvant, function of adjuvant is :

(A) To increase the immune response

(B) To suppress the immune response

(C) To protect the animal from infection

(D) None of the above

55. Which of the following is not a method for antibody purification ?

(A) Ammonium Sulphate Precipitation

(B) Affinity Chromatography Purification

(C) Ion Exchange Chromatography

(D) Western Blotting

56. Baculovirus based expression vectors are used for :

(A) Insect cells

(B) Mammalian cells

(C) E. coli

(D) Agrobacterium

57. During gene therapy, the genes can be introduced into the cell by :

(A) Microinjection

(B) Some viruses

(C) Both (A) and (B)

(D) $CaCl_2$ treatment

58. When functional genes are introduced into sperm or egg cell, the type of gene therapy called :

(A) Somatic cell gene therapy

(B) Germline gene therapy

(C) Vegetative cell gene therapy

(D) Reproduction gene therapy

59. In somatic cell gene therapy, the functional genes can be introduced into :

(A) Sperm

(B) Egg

(C) Any cell of body

(D) Germinal cells

60. Bt cotton is a :

(A) A cotton variety obtained by breeding two different cotton plants

(B) A cotton variety brought from South America

(C) An insecticide sprayed on cotton plants

(D) A transgenic cotton variety

61. In biotechnology, mass culturing of cells/ microbes can be achieved by using :

(A) Test tube culture

(B) Bioreactor

(C) Thermal cycler

(D) Autoclave

62. A device in which a substrate of low value is utilized by living cells or enzyme to generate a high value product is called :

(A) Bioreactor

(B) Electrophoresis

(C) Chromatography

(D) Test tube culture

63. A bioreactor must have :

(A) Agitation for mixing cells and medium

(B) Sterile conditions

(C) Regulation of temperature, pH etc.

(D) All of the above

64. There will be minimum chance for tissue transplant rejection between :

(A) Identical twins

(B) Father and son

(C) Mother and daughter

(D) Grand parents and grand childrens

65. The DNA molecule to which the gene of interest is integrated for cloning is called :

(A) Carrier

(B) Transformer

(C) Vector

(D) None of the above

66. DNA can be separated by :

(A) Gel electrophoresis

(B) Autoradiography

(C) X-ray crystallography

(D) Centrifugation

67. Technique involved in preparation of genomic libraries :

(A) PCR technique

(B) Shotgun experiment

(C) Colony hybridization

(D) All of these

68. The sites of DNA where restriction enzymes act are generally :

(A) Palindromic

(B) Tandem repeats

(C) GC-rich regions

(D) TATA boxes

69. The most effective treatment for genetic disorder in the present time is :

(A) Gene mapping

(B) Genetic counselling

(C) Gene therapy

(D) Gene cloning

70. Cells obtained from cancerous tumors are called :

(A) Galls

(B) Myelomas

(C) Hybridomas

(D) Antibodies

71. A person shows presence of interferons in body, he may got infection of :

(A) Tapeworm

(B) Measles

(C) Tetanus

(D) Malaria

72. The enzyme used in PCR technology :

(A) RNA polymerase

(B) DNA polymerase I

(C) Taq DNA polymerase

(D) DNA topoisomerase

73. Which of the following recombinant protein is used to dissolve blood cloths during heart attacks ?

(A) Insulin

(B) Interferon

(C) Tissue plasminogen activator

(D) Antihemophilic factor

74. Secondary antibody is :

(A) Antibody against antigen

(B) Antibody against antibody

(C) Antibody against pathogen

(D) Monoclonal antibody

75. A technique called Southern Blotting is used in :

(A) Monoclonal antibody production

(B) Genetic fingerprinting

(C) In vitro culture

(D) In vivo protein localization

76. Genetic fingerprinting is useful in :

(A) Identifying criminals of rape and murder

(B) To establish parentage of a child

(C) Identifying illegal immigrants

(D) All of the above

77. In DNA fingerprinting, small amount of collected DNA sample can be multiplied into millions of copies by the technique :

(A) Autoradiography

(B) Southern Blotting

(C) Polymerase Chain Reaction

(D) Electrophoresis

78. RFLP, VNTR, Probe are some terms associated with :

(A) DNA fingerprinting

(B) Animal tissue culture

(C) In vitro fertilization

(D) Hybridoma technology

79. Dolly, the first animal produced through cloning is :

(A) Camel

(B) Rat

(C) Cow

(D) Sheep

80. Gene therapy helps in :

(A) Saving endangered species

(B) Curing genetic disorders

(C) Clonal propagation

(D) Producing monoclonal antibodies

81. By gene therapy, inherited diseases can be cured by :

(A) Repairing the faulty gene

(B) Introducing a correct copy of gene

(C) Adding new cell to the body

(D) Polymerase Chain Reaction

82. What are liposomes ?

(A) Spherical vesicles with phospholipid bilayer

(B) Part of lysosome

(C) Spherical vesicle made up of protein

(D) Aggregated ribosomes

83. Liposomes are used for :

(A) To lyse cellular debris

(B) To deliver drug or DNA into cells

(C) To induce DNA recombination

(D) To induce apoptosis

84. The antibiotics :

(A) Kills bacteria

(B) Kills viruses

(C) Causes inflammation

(D) Stimulates immune system

85. Culture media for animal cells contain :

(A) Vitamins and amino acids

(B) Glucose

(C) Growth factors

(D) All of the above

86. Name the type of culture which is prepared by inoculating directly from tissue of animal to culture media :

(A) Primary cell culture

(B) Secondary cell culture

(C) Cell lines

(D) Transformed cell culture

87. What is a cell line ?

(A) Multilayer culture

(B) Transformed cells

(C) Multiple growth of cells

(D) Sub-culturing of primary culture

88. Transformed cell lines can :

(A) Grow infinitely

(B) Divide upto 50 cell divisions

(C) Convert into stem cells

(D) Acquire contact inhibition

89. Poly Ethylene Glycol (PEG) induces :

(A) Cell growth

(B) Apoptosis

(C) Cell fusion

(D) Necrosis

90. Continuous cell lines are :

(A) Transformed

(B) Genetically modified

(C) Attenuated

(D) All of the above

91. Cryopreservation of animal cells require :

(A) Nitrogen

(B) Liquid Nitrogen

(C) Hydrogen

(D) Ice

92. Which of the following cryoprotectant for animal cell during cryopreservation ?

(A) Glycerol

(B) Dimethyl Sulfoxide (DMSO)

(C) Both (A) and (B)

(D) Chlorofluorocarbon (CFC)

93. Interferons are :

(A) Antibiotics

(B) Signalling proteins

(C) Structural proteins

(D) Enzymes

94. Interferons inhibit growth of :

(A) Viruses

(B) Bacteria

(C) Fungus

(D) Protozoan parasites

95. Interleukin play major role in :

(A) Immune system

(B) Nervous system

(C) Muscular system

(D) Digestive system

96. Neurotropins are :

(A) Epidermal growth factors

(B) Nerve growth factors

(C) Fibroblast growth factors

(D) Platelet derived growth factor

97. To be useful in the preparation of recombinant DNA, a plasmid must have :

(A) No origin of replication

(B) An origin of replication

(C) The ability to alternate between linear and circular forms

(D) Restriction endonuclease activity

98. Restriction endonucleases have ability of cutting :

(A) DNA at specific sites

(B) DNA a random sites

(C) Both (A) and (B)

(D) DNA and RNA at random sites

99. A plasmid consisting of its own DNA with a foreign DNA inserted into it is called :

(A) Vector DNA

(B) Non-coding DNA

(C) Recombinant DNA

(D) None of the above

100. Insulin, a protein, consisting of :

(A) 1 polypeptide chain

(B) 2 polypeptide chains

(C) 3 polypeptide chains

(D) 4 polypeptide chains

Rough Work

Example :

Question :

Q.1 Ⓐ ● Ⓒ Ⓓ
Q.2 Ⓐ Ⓑ ● Ⓓ
Q.3 Ⓐ ● Ⓒ Ⓓ

If more than 75 questions are attempted by candidate, then the first attempted 75 questions will be considered for evaluation.

4. Each question carries equal marks. Marks will be awarded according to the number of correct answers you have.
5. All answers are to be given on OMR Answer Sheet only. Answers given anywhere other than the place specified in the answer sheet will not be considered valid.
6. Before writing anything on the OMR Answer Sheet, all the instructions given in it should be read carefully.
7. After the completion of the examination, candidates should leave the examination hall only after providing their question booklet and OMR Answer Sheet separately to the invigilator.
8. There will be no negative marking.
9. Rough work, if any, should be done on the blank pages provided for the purpose in the booklet.
10. To bring and use of log-book, calculator, pager & cellular phone in examination hall is prohibited.
11. In case of any difference found in English and Hindi version of the question, the English version of the question will be held authentic.

Impt. On opening the question booklet, first check that all the pages of the question booklet are printed properly. If there is any discrepancy in the question Booklet, then after showing it to the invigilator, get another question Booklet of the same series.

उदाहरण :

प्रश्न :

प्रश्न 1 Ⓐ ● Ⓒ Ⓓ
प्रश्न 2 Ⓐ Ⓑ ● Ⓓ
प्रश्न 3 Ⓐ ● Ⓒ Ⓓ

यदि परीक्षार्थी द्वारा 75 से अधिक प्रश्नों को हल किया जाता है तो प्रारम्भिक हल किये हुए 75 उत्तरों को ही मूल्यांकन हेतु सम्मिलित किया जाएगा।

4. प्रत्येक प्रश्न के अंक समान हैं। आपके जितने उत्तर सही होंगे, उन्हीं के अनुसार अंक प्रदान किये जायेंगे।
5. सभी उत्तर केवल ओ०एम०आर० उत्तर-पत्रक (OMR Answer Sheet) पर ही दिये जाने हैं। उत्तर-पत्रक में निर्धारित स्थान के अलावा अन्यत्र कहीं पर दिया गया उत्तर मान्य नहीं होगा।
6. ओ०एम०आर० उत्तर-पत्रक (OMR Answer Sheet) पर कुछ भी लिखने से पूर्व उसमें दिये गये सभी अनुदेशों को सावधानीपूर्वक पढ़ लिया जाये।
7. परीक्षा समाप्ति के उपरान्त परीक्षार्थी कक्ष निरीक्षक को अपनी प्रश्नपुस्तिका बुकलेट एवं ओ०एम०आर० शीट पृथक-पृथक उपलब्ध कराने के बाद ही परीक्षा कक्ष से प्रस्थान करें।
8. निगेटिव मार्किंग नहीं है।
9. कोई भी रफ कार्य, प्रश्न-पुस्तिका में, रफ-कार्य के लिए दिए खाली पेज पर ही किया जाना चाहिए।
10. परीक्षा-कक्ष में लॉग-बुक, कैल्कुलेटर, पेजर तथा सेल्युलर फोन ले जाना तथा उसका उपयोग करना वर्जित है।
11. प्रश्न के हिन्दी एवं अंग्रेजी रूपान्तरण में भिन्नता होने की दशा में प्रश्न का अंग्रेजी रूपान्तरण ही मान्य होगा।

महत्वपूर्णः प्रश्नपुस्तिका खोलने पर प्रथमतः जाँच कर देख लें कि प्रश्नपुस्तिका के सभी पृष्ठ भलीभाँति छपे हुए हैं। यदि प्रश्नपुस्तिका में कोई कमी हो, तो कक्षनिरीक्षक को दिखाकर उसी सिरीज की दूसरी प्रश्नपुस्तिका प्राप्त कर लें।