POST GRADUATE COMMON ENTRANCE TEST-2019

DATE and TIME	COURSE	SUBJECT
20-07-2019 2.30 p.m. to 4.30 p.m.	ME/M.Tech/M.Arch/ courses offered by VTU/UVCE/UBDTCE	BIO-TECHNOLOGY

MAXIMUM MARKS	TOTAL DURATION	MAXIMUM TIME FOR ANSWERING
100	150 Minutes	120 Minutes

MENTION YOUR PGCET NO.					QUESTION BOOKLET DETAILS	
					VERSION CODE	SERIAL NUMBER
					E	152013

DOs :

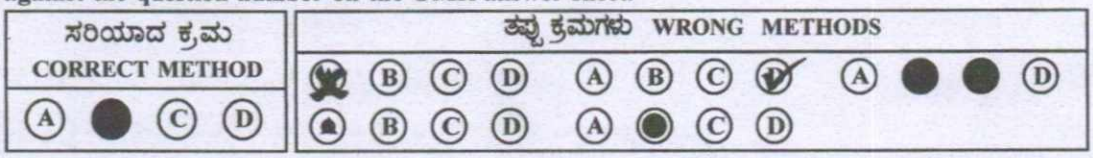
1. Candidate must verify that the PGCET number & Name printed on the OMR Answer Sheet is tallying with the PGCET number and Name printed on the Admission Ticket. Discrepancy if any, report to invigilator.
2. This question booklet is issued to you by the invigilator after the **2nd bell i.e., after 2.25 p.m.**
3. The Version Code of this Question Booklet should be entered on the OMR Answer Sheet and the respective circle should also be shaded completely.
4. The Version Code and Serial Number of this question booklet should be entered on the Nominal Roll without any mistakes.
5. Compulsorily sign at the bottom portion of the OMR answer sheet in the space provided.

DON'Ts :

1. **The timing and marks printed on the OMR answer sheet should not be damaged / mutilated / spoiled.**
2. The **3rd Bell rings at 2.30 p.m., till then;**
   - Do not remove the paper seal / polythene bag present on the right hand side of this question booklet.
   - Do not look inside this question booklet.
   - Do not start answering on the OMR answer sheet.

IMPORTANT INSTRUCTIONS TO CANDIDATES

1. This question booklet contains 75 (items) questions and each question will have one statement and four answers. (Four different options / responses.)
2. After the **3rd Bell is rung at 2.30 p.m.,** remove the paper seal / polythene bag on the right hand side of this question booklet and check that this booklet does not have any unprinted or torn or missing pages or items etc., if so, get it replaced by a complete test booklet. Read each item and start answering on the OMR answer sheet.
3. During the subsequent 120 minutes :
   - Read each question (item) carefully.
   - Choose one correct answer from out of the four available responses (options / choices) given under each question / item. In case you feel that there is more than one correct response, mark the response which you consider the best. In any case, choose **only one response** for each item.
   - **Completely darken / shade the relevant circle with a BLUE OR BLACK INK BALL POINT PEN against the question number on the OMR answer sheet.**



4. Use the space provided on each page of the question booklet for Rough Work. Do not use the OMR answer sheet for the same.
5. After the **last Bell is rung at 4.30 p.m.,** stop marking on the OMR answer sheet and affix your **left hand thumb impression** on the OMR answer sheet as per the instructions.
6. Handover the **OMR ANSWER SHEET** to the room invigilator as it is.
7. After separating the top sheet (KEA copy), the invigilator will return the bottom sheet replica (Candidate's copy) to you to carry home for self-evaluation.
8. Preserve the replica of the OMR answer sheet for a minimum period of **ONE year**.
9. Only **Non-programmable** calculators are allowed.

Marks Distribution

PART-1 : 50 QUESTIONS CARRY ONE MARK EACH (1 TO 50)
PART-2 : 25 QUESTIONS CARRY TWO MARKS EACH (51 TO 75)

BT-E

BIOTECHNOLOGY

PART – 1

Each question carries one mark. **(50 × 1 = 50)**

1. Who was regarded as the 'Father of Microbiology' ?
   (A) Robert Koch
   (B) Louis Pasteur
   (C) Antony Van Leuwenhoek
   (D) Alexander Fleming

2. The bacteria which utilizes CO_2 as the sole source of carbon :
   (A) Phototrophs
   (B) Autotrophs
   (C) Lithotrophs
   (D) Chemotrophs

3. Name the bacteria appeared as grape like cluster in their morphological form.
   (A) *E. coli*
   (B) *Staphylococcus*
   (C) *Streptococcus*
   (D) *Pseudomonas*

4. Transfer of genetic material from one bacteria to another by means of bacteriophages are known as
   (A) Transduction
   (B) Conjugation
   (C) Transformation
   (D) Recombination

5. Which of the following antibiotic is regarded as last line drugs against Gram negative bacteria ?
   (A) Amino glycosides
   (B) Carbapenams
   (C) β-lactams
   (D) Macrocyclic lactones

6. The structure of collagen was demonstrated by
   (A) Frederick Sanger
   (B) James Watson
   (C) Linus Pauling
   (D) Max Pesutz

Space For Rough Work

7. Which Amino acid is F ?
   (A) Valine
   (B) Glutamine
   (C) Phenyl alanine
   (D) Glutamic acid

8. The helix pitch of a B DNA is
   (A) 25.30 Å
   (B) 23.7 Å
   (C) 45.6 Å
   (D) 35.36 Å

9. Induced fit model of enzyme substrate reaction is proposed by
   (A) Emil Fischer
   (B) Daniel Koshland
   (C) Edward Bachner
   (D) Wendell Meredith Stanley

10. The order of cell cycle is
   (A) $G_0 \rightarrow G_1 \rightarrow S \rightarrow G_2 \rightarrow M$
   (B) $G_0 \rightarrow G_1 \rightarrow M \rightarrow G_2 \rightarrow S$
   (C) $G_1 \rightarrow G_0 \rightarrow S \rightarrow G_2 \rightarrow M$
   (D) $G_1 \rightarrow G_0 \rightarrow M \rightarrow G_2 \rightarrow S$

11. Test cross is a cross between
   (A) Hybrid × recessive parent
   (B) Dominant parent × recessive parent
   (C) Hybrid × Hybrid
   (D) Hybrid × dominant parent

12. X-linked recessive gene is
   (A) Always expressed in male
   (B) Always expressed in female
   (C) Never expressed in males
   (D) Always expressed in males and female

13. A protein that bind to DNA and regulate gene expression by promoting or suppressing transcription :
   (A) Transcriptional factor
   (B) Coactivator
   (C) Corepressor
   (D) Activator

14. The stop codon 'opal' is
   (A) UAG
   (B) UGA
   (C) UAA
   (D) UGG

15. The newly synthesized DNA fragment that are formed on the lagging template strand during DNA replication.
   (A) Klenow fragment
   (B) Okazaki fragment
   (C) Conseus sequence
   (D) Leading strand

Space For Rough Work

16. Select a secondary metabolite from the following :

(A) Amino acid

(B) Antibiotic

(C) Alcohol

(D) Vitamins

17. Name the producer organism used in industrial production of glutamic acid.

(A) Corynebacterium

(B) Shigella

(C) Aspergillus

(D) Enterobacter

18. Select the name of the bacteria used in the bioremediation of oil spills

(A) *E. coli*

(B) *Pseudomonas*

(C) *Protens*

(D) *Staphylococcus*

19. Which process is considered as biological process in waste water treatment ?

(A) Primary treatment

(B) Secondary treatment

(C) Tertiary treatment

(D) Quaternary treatment

20. Baker's yeast is developed and established by

(A) Louis Pasteur

(B) Aristole

(C) Robert Koch

(D) Fransco Reddi

21. Which of the following is used as a nitrogen source in fermentation media ?

(A) Malt extract

(B) Molasses

(C) Corn steep liquor

(D) Starch

22. Give an example of antifoam agent in fermentation.

(A) Ether

(B) Glucose

(C) Silicons

(D) Terpensich

23. Turbido stat is an example of

(A) Batch culture

(B) Continuous culture

(C) Fed batch culture

(D) Synchronous culture

Space For Rough Work

24. The structural components of a fermentor involved in aeration process.
(A) Impeller
(B) Sparger
(C) Baffles
(D) Stirrer

25. Temperature measurement and control in a fermenter is performed by
(A) Thermocouple
(B) Thermistor
(C) Thermometer
(D) All of these

26. Which of the following Antibody is a pentamer ?
(A) I_gG
(B) I_gD
(C) I_gE
(D) I_gM

27. The mediators of Allergy :
(A) I_gG
(B) I_gE
(C) I_gD
(D) I_gM

28. Which of the following is an immune complex disease ?
(A) Serum sickness
(B) Rheumatoid arthritis
(C) Coeliac disease
(D) Multiple sclerosis

29. The production of monoclonal antibodies was invented by
(A) James Chamberland
(B) Rosalind Franklin
(C) Leonard Heisenberg
(D) George Kohler

30. WIDAL test is used for the serodiagnosis of
(A) Tuberculosis
(B) Syphilis
(C) AIDS
(D) Enteric fever

31. The restriction enzyme PVUII is obtained from
(A) Proteins
(B) Pseudomonas
(C) Parcellea
(D) Providentia

Space For Rough Work

32. The recoganition sequence of BamH1 is
(A) 5' - GGATCC
(B) 5' - GAATCC
(C) 5' - GAATTC
(D) 5' - GGTACC

33. Number of genes present in Ti plasmid
(A) 175
(B) 196
(C) 201
(D) 194

34. The size of pBR322 plasmid is
(A) 4631 bp
(B) 4361 bp
(C) 4561 bp
(D) 4261 bp

35. Name the vector which uses lamda phage cos site.
(A) Plasmid
(B) Cosmid
(C) Phasmid
(D) Viral vectors

36. Name the test used to study the quality of drinking water.
(A) Membrane filter
(B) Most probable number
(C) Roll tube
(D) Dye reduction

37. MSG is used in food industry as
(A) Sweetners
(B) Stabilised
(C) Substituents
(D) Anti-nutritional factor

38. Radiation sterilization which uses high dose of radiation in food industry ?
(A) Radio apertisation
(B) Radurization
(C) Radicidation
(D) Radiation pasteurisation

39. The temperature used for Flash process in food preservation :
(A) 68.2 °C
(B) 62.8 °C
(C) 71.7 °C
(D) 68.5 °C

40. Appertization is otherwise known as
(A) Tyndalisation
(B) Canning
(C) Pasteurisation
(D) Cold sterilisation

41. Cryogenic freezing in food industry are carried out at
(A) –100 °C
(B) –196 °C
(C) –150 °C
(D) –200 °C

Space For Rough Work

42. Potato blight is caused by
(A) Rhizopus
(B) Phytophthora
(C) Penicillium
(D) Aspergillus

43. Red rot in egg is due to
(A) Pseudomonas
(B) Serratia
(C) Flavobacterium
(D) Alcaligenes

44. Well-lit, open surface water in a lake away from the shore, is termed as
(A) Profound zone
(B) Littoral zone
(C) Limnetic zone
(D) Benthic zone

45. The main biofilm, producing bacterial used in trickling filter is
(A) Zooglea
(B) *E. coli*
(C) Bacillus
(D) *Clostridium*

46. Name the structural database present in NCBI.
(A) PIR
(B) OMIM
(C) CATH
(D) MMDB

47. Which of the following is tool for multiple sequence analysis ?
(A) CLUSTAL W
(B) T-COFFEE
(C) CINEMA
(D) All of these

48. The fundamental unit of a phylogenetic free
(A) Taxa
(B) Node
(C) Clade
(D) Root

49. Which of the following is NOT a molecular visualisation tool ?
(A) Chimera
(B) PyMOL
(C) PHYLIP
(D) VMD

50. The distance based tree building method which used to construct a rooted tree.
(A) UPGMA
(B) FM
(C) NJ
(D) MP

Space For Rough Work

PART – 2

Each question carries two marks. **(25 × 2 = 50)**

51. Analyze the mutational changes in haemoglobin gene that leads to sickle cell anemia.

(A) Valine is substituted by Glutamic acid.

(B) Glutamic acid is substituted by valine.

(C) Valine is substituted by Glutamine.

(D) Glutamine is substituted by valine.

52. Name the amino acid which forms helix in a polypeptide chain.

(A) Glycine

(B) Proline

(C) Tryptophan

(D) Both (A) and (B)

53. The molecular weight of molecular chaperon HSP70 is _____ dalton.

(A) 68000

(B) 70000

(C) 72000

(D) 80000

54. The melting temperature (T_m) of the oligonucleotide sequence "GCATGCATGCCATGCAT" is

(A) 48 °C

(B) 52 °C

(C) 50 °C

(D) 56 °C

55. The size of t-RNA is _____ nucleotides.

(A) 73-95

(B) 73-93

(C) 75-95

(D) 75-93

56. The equation for mass transfer coefficient (k_c)

(A) $k_c = \frac{\eta A}{A \Delta C_A}$

(B) $k_c = \frac{C_A \eta}{\Delta C_A}$

(C) $k_c = \frac{\eta A}{\Delta C_A}$

(D) $k_c = \frac{A}{\eta A \Delta C_A}$

57. The precursor used in penicillin fermentation

(A) Sodium bisulfate

(B) Phenyl acetic acid

(C) Potassium bisulfate

(D) Phenyl phenoxy acetic acid

Space For Rough Work

58. Which is the following is a fat soluble vitamin ?
(A) Vitamin A
(B) Vitamin B
(C) Vitamin C
(D) All of these

59. Which of the following is the heterocyclic nitrogen containing antibiotic ?
(A) Rifamycin
(B) Cycloserin
(C) Bacitracin
(D) Polyoxins

60. The organism used to produce ethanol is
(A) Zymomonas
(B) Vibrio
(C) Clostridium
(D) Edwersiella

61. A single nucleotide change results in a codon that code for a different amino acid is related with
(A) Missense mutation
(B) Non-sense mutation
(C) Frame shift mutation
(D) Spontaneous mutation

62. Which enzyme is known as Kornberg enzyme ?
(A) DNA polymerase-I
(B) DNA ligases
(C) Topoisomerage
(D) Gyrases

63. RNA molecular have the catalytic activity :
(A) Ribozymes
(B) Apoenzymes
(C) RNA polymerase
(D) SnRNA

64. Chemical degradation method is otherwise known as
(A) Edman degradation
(B) Maxam Gilbert Method
(C) Sanger Method
(D) Fluorescent Method

65. The enzyme used in PCR
(A) Taq polymerase
(B) Pfu polymerase
(C) Vent polymerase
(D) All of these

66. An example of auxotrophic selection marker used in vector
(A) Amp
(B) Lacz
(C) URAZ
(D) Tet

Space For Rough Work

67. Trizol is a reagent used for
(A) Isolation of RNA
(B) Isolation of mitochondria
(C) Isolation plasmid
(D) Separation of heterochromatin

68. An associative symbiotic nitrogen fixing bacteria :
(A) Rhizobium
(B) Rhizopus
(C) Azospirillum
(D) Nitrosomonas

69. Transposoms are identified by
(A) Elie Mechnikoff
(B) Barbara Macclintoff
(C) Joshua Leaderberg
(D) Arthur Kornberg

70. Which of the first free living organism whose genome was completely sequenced.
(A) *Drosophila melanogaster*
(B) *Haemophilus influenzae*
(C) *E. coli*
(D) *Mus musculus*

71. Cytoplasmic invaginations are commonly present in bacteria
(A) Nuclear elements
(B) Magnetosome
(C) Mesosomes
(D) Inclusion body

72. Which of the following amino acid is an aromatic amino acid ?
(A) Phenyl alanine
(B) Valine
(C) Glutamine
(D) Arginine

73. The Complex-II present in Electron transport chains
(A) ubiquinone oxidoreductase
(B) succinate dehydrogenase
(C) cytochrome bc_1
(D) cytochrome oxidase

74. Which of the following is NOT a molecular docking software ?
(A) ADAM
(B) GEMDOCK
(C) YASARA
(D) CHIMERA

75. Name the scoring matrices used for the sequence alignment of divergent sequences.
(A) BLOSUM62
(B) PAM100
(C) PAM250
(D) BLOSUM80

Space For Rough Work

Space For Rough Work