

**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
		<b>E</b>
		SERIAL NUMBER
		<b>152013</b>

**DOs :**

- 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.
- This question booklet is issued to you by the invigilator after the 2<sup>nd</sup> bell i.e., after 2.25 p.m.
- The Version Code of this Question Booklet should be entered on the OMR Answer Sheet and the respective circle should also be shaded completely.
- The Version Code and Serial Number of this question booklet should be entered on the Nominal Roll without any mistakes.
- Compulsorily sign at the bottom portion of the OMR answer sheet in the space provided.

**DON'Ts :**

- The timing and marks printed on the OMR answer sheet should not be damaged / mutilated / spoiled.
- The 3<sup>rd</sup> 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**

- This question booklet contains 75 (items) questions and each question will have one statement and four answers. (Four different options / responses.)
- After the 3<sup>rd</sup> 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.
- 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.**

ಸರಿಯಾದ ಕ್ರಮ CORRECT METHOD	ತಪ್ಪು ಕ್ರಮಗಳು WRONG METHODS

- Use the space provided on each page of the question booklet for Rough Work. Do not use the OMR answer sheet for the same.
- 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.
- Handover the OMR ANSWER SHEET to the room invigilator as it is.
- 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.
- Preserve the replica of the OMR answer sheet for a minimum period of ONE year.
- 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



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POSTGRADUATE COMMON ENTRANCE TEST-2019

DATE/TIME	COLLEGE	SUBJECT
10.00 AM TO 12.00 PM	MEERUT UNIVERSITY	PHYSICS
MAXIMUM MARKS	100 MARKS	100 MARKS
QUESTION YOUR SHEET NO.	OPERATION BOOKLET DETAILS	SEAT NUMBER

INSTRUCTIONS FOR CANDIDATES

1. Candidates should bring their admit card and a valid photo ID card with them to the examination centre.

2. Candidates should reach the examination centre at least 30 minutes before the start of the examination.

3. Candidates should not bring any mobile phone, calculator, or any other electronic device to the examination centre.

4. Candidates should not discuss the questions with other candidates during the examination.

5. Candidates should not write anything on the question paper.

6. Candidates should not use any unfair means during the examination.

7. Candidates should not leave the examination centre without the permission of the invigilator.

8. Candidates should not take any material out of the examination centre.

9. Candidates should not use any writing instrument other than the one provided.

10. Candidates should not fold or tear the question paper.

11. Candidates should not use any other language other than the one specified.

12. Candidates should not use any other script other than the one specified.

13. Candidates should not use any other method other than the one specified.

14. Candidates should not use any other material other than the one specified.

15. Candidates should not use any other facility other than the one specified.

1. The question paper is divided into two parts, A and B. Part A contains 10 questions and Part B contains 10 questions. Candidates should attempt all the questions in Part A and any 10 questions in Part B.

2. The duration of the examination is 2 hours. Candidates should not exceed this duration.

3. The maximum marks for the examination are 100. Candidates should not exceed this mark.

4. The question paper is in English. Candidates should not use any other language.

5. The question paper is in the Hindi script. Candidates should not use any other script.

6. The question paper is in the Urdu script. Candidates should not use any other script.

7. The question paper is in the Sanskrit script. Candidates should not use any other script.

8. The question paper is in the Assamese script. Candidates should not use any other script.

9. The question paper is in the Bengali script. Candidates should not use any other script.

10. The question paper is in the Gujarati script. Candidates should not use any other script.

11. The question paper is in the Kannada script. Candidates should not use any other script.

12. The question paper is in the Malayalam script. Candidates should not use any other script.

13. The question paper is in the Marathi script. Candidates should not use any other script.

14. The question paper is in the Odia script. Candidates should not use any other script.

15. The question paper is in the Punjabi script. Candidates should not use any other script.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20

1. The question paper is in the English script. Candidates should not use any other script.

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13. The question paper is in the Telugu script. Candidates should not use any other script.

14. The question paper is in the Tamil script. Candidates should not use any other script.

15. The question paper is in the Vietnamese script. Candidates should not use any other script.

BT 2 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<sub>2</sub> 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  $\times$  recessive parent  
(B) Dominant parent  $\times$  recessive parent  
(C) Hybrid  $\times$  Hybrid  
(D) Hybrid  $\times$  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<sub>g</sub>G
  - (B) I<sub>g</sub>D
  - (C) I<sub>g</sub>E
  - (D) I<sub>g</sub>M
27. The mediators of Allergy :
- (A) I<sub>g</sub>G
  - (B) I<sub>g</sub>E
  - (C) I<sub>g</sub>D
  - (D) I<sub>g</sub>M
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) Parcelllea
  - (D) Providentia

Space For Rough Work



32. The recognition sequence of BamHI is  
(A) 5' - GGATCC  
(B) 5' - GAATCC  
(C) 5' - GAATC  
(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 tree  
(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 of 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) Edwardsiella
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) Topoisomerase
  - (D) Gyrase
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. Transposons are identified by  
(A) Elie Mechnikoff  
(B) Barbara Macclintoff  
(C) Joshua Lederberg  
(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<sub>1</sub>  
(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

