

## POST GRADUATE COMMON ENTRANCE TEST-2016

DATE and TIME	COURSE	SUBJECT
03-07-2016 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
		A - 1
		SERIAL NUMBER
		210303

**DOs :**

1. Check whether the PGCET No. has been entered and shaded in the respective circles on the OMR answer sheet.
2. Ensure whether the circles corresponding to course and the specific branch have been shaded on the OMR answer sheet.
3. This Question Booklet is issued to you by the invigilator after the 2<sup>nd</sup> Bell i.e., after 2.25 p.m.
4. The Serial Number of this question booklet should be entered and the respective circles should also be shaded completely on the OMR answer sheet.
5. The Version Code of this question booklet should be entered on the OMR answer sheet and the respective circles should also be shaded completely on the OMR answer sheet.
6. 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 3<sup>rd</sup> Bell rings at 2.30 p.m., till then;
  - Do not remove the paper seal / polythene bag 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 3<sup>rd</sup> Bell is rung at 2.30 p.m., remove the paper seal / polythene bag 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.**

Correct Method of shading the circle on the OMR answer sheet is as shown below :



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-A1



1. [Illegible text]

2. [Illegible text]

3. [Illegible text]

4. [Illegible text]

5. [Illegible text]

6. [Illegible text]

7. [Illegible text]

8. [Illegible text]

9. [Illegible text]

10. [Illegible text]

**[Illegible Section Header]**

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# BIOTECHNOLOGY

## PART - 1

Each question carries one mark.

(50 × 1 = 50)

1. The technique for separating loci on chromosome  
(A) Electrophoresis  
(B) Chromatography  
(C) Banding  
(D) Centrifugation
2. Fluorescent tagged oligonucleotide DNA sequence used to identify unknown gene by hybridization is called  
(A) Helper gene  
(B) Probe  
(C) Ligand  
(D) c-DNA
3. Glycosylated protein from microbe can be obtained by  
(A) Plant cell  
(B) Animal cell  
(C) Mycoplasma  
(D) Yeast
4. In the genome, the virus inserted is recognized by  
(A) PCR  
(B) FISH  
(C) Northern Blot  
(D) Southern Blot
5. Plant transformation method by which gene is introduced into chloroplast genome is  
(A) Electroporation  
(B) Permeabilization  
(C) Particle-delivery system  
(D) Agrobacterium mediated transformation
6. Flow cytometer measures number of  
(A) DNA  
(B) Protein  
(C) RNA  
(D) Cells
7. In bioinformatics for structural proteomics, the structure of protein is determined by  
(A) PDB  
(B) EMBL  
(C) NIH  
(D) Gene Bank
8. Resistance to herbicide chlorosulfan in plants is due to change in  
(A) Glutamine synthetase  
(B) Threonine deaminase  
(C) Acetolactate synthase  
(D) DNA polymerase

Space For Rough Work

9. A heterologous protein expressing milk in transgenic animal would be under the control of gene promoter coding for
- (A)  $\beta$  - lactoglobulin
  - (B)  $\beta$  - globin
  - (C) Preproinsulin
  - (D) Lac Z
10. The component of Ti plasmid required for integration into plant genome is
- (A) Origin of replication
  - (B) Tumor inducing gene
  - (C) Nopaline gene
  - (D) All the above
11. The energy is required in which process ?
- (A) Hybridization
  - (B) Ligation
  - (C) Transduction
  - (D) Restriction digestion
12. Gel retardation assay is used to study interactions between
- (A) Protein and Nucleic acid
  - (B) Protein
  - (C) Nucleic acid
  - (D) Drug
13. DNA mobility in agarose gel electrophoresis is used in
- (A) Charge
  - (B) Confirmation
  - (C) Size
  - (D) None of the above
14. The technique used for mass propagation of elite plants is
- (A) Crossing
  - (B) Breeding
  - (C) *in vitro* culture
  - (D) Grafting
15. The competent bacteria for transformation of DNA is
- (A) *Escherichia coli*
  - (B) *Bacillus subtilis*
  - (C) *Yersinia alba*
  - (D) *Mycobacterium tuberculosis*
16. Expressed sequence Tag is defined as
- (A) Partial sequence of codon randomly selected from DNA library
  - (B) Characteristic gene expressed in the cell
  - (C) Protein coding DNA sequence of the gene
  - (D) Uncharacterized fragment for presence of DNA in cell

Space For Rough Work

17. Agarose gel is used for separation of DNA fragments because
- (A) Positively charged agarose traps negatively charged DNA.
  - (B) Longer DNA fragments move through the gel faster.
  - (C) Agarose impede movement of larger DNA fragments than smaller ones.
  - (D) Positively charged DNA is slowed by negatively charged agarose.
18. Database means
- (A) Storing and organizing data
  - (B) Accessing data
  - (C) Managing data
  - (D) GP of Software
19. NCBI means
- (A) National Biotechnology Centre Information
  - (B) National Centre for Biotechnology Information
  - (C) National Council for Biotechnology Information
  - (D) National Corporation for Biotechnology Information
20. To find 'x' protein, database used is
- (A) NCBI
  - (B) TREMBL
  - (C) PIR
  - (D) PROSITE
21. Study of evolutionary relationship is called
- (A) Genomics
  - (B) Proteomics
  - (C) Genetics
  - (D) Phylogenetics
22. Negative potential across plasma membrane is maintained by
- (A) Passive transport
  - (B) Active transport
  - (C) Ion channel
  - (D) Transporters
23. The membrane lipid molecules form bilayers when placed in water to form spherical structure called
- (A) Liposome
  - (B) Lysosome
  - (C) Endosome
  - (D) Lactosome
24. The site of respiration in bacteria is
- (A) Cytoplasm
  - (B) Microsomes
  - (C) Endoplasmic reticulum
  - (D) Golgi bodies

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Space For Rough Work

25. Protein degradation takes place in  
(A) Lysosome  
(B) Mitochondria and Lysosome  
(C) Lysosome and Cytoplasm  
(D) Mitochondria
26. Characteristic feature of micro-organism is,  
(A) they are multicellular.  
(B) they have distinct nucleus.  
(C) they are visible only with microscope.  
(D) they perform photosynthesis.
27. Food produced by micro-organism for human consumption is  
(A) Milk  
(B) Ham  
(C) Yogurt  
(D) Cucumber
28. Organisms found in fungal kingdom are  
(A) Viruses and Yeast  
(B) Yeasts and Molds  
(C) Molds and Bacteria  
(D) Bacteria and Protozoa
29. Characteristic feature of eukaryote is,  
(A) they do not have organelles.  
(B) they have single chromosome.  
(C) they have nucleus and organelles.  
(D) they do not divide by mitosis.
30. Peptidoglycan is found in  
(A) Ribosomes of eukaryotes  
(B) Cell wall of bacteria  
(C) Chromosomes of eukaryotes  
(D) Cell membrane of bacteria
31. Endocytosis permits  
(A) Cell motion  
(B) Breakdown of carbohydrates and energy release  
(C) Materials to pass into the cell  
(D) Mitosis to take place
32. During stationary phase of growth of micro-organisms  
(A) Rate of cell division increases  
(B) Rate of cell division decreases  
(C) Population is at its vigorous state  
(D) Population is at decline state
33. Chemical units of DNA and RNA are  
(A) Amino acids  
(B) Nucleotides  
(C) Enzyme molecules  
(D) NAD and FAD
34. UV light causes mutation in bacteria by  
(A) Breaking the chromosome  
(B) Causing the frameshift  
(C) Binding together adjacent thymine bases  
(D) Reversing the segment of DNA

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Space For Rough Work

35. When virus remaining with chromosome of host bacterium for long period, viral DNA is called
- (A) Adenovirus
  - (B) Baculovirus
  - (C) Enterovirus
  - (D) Provirus
36. Restriction enzymes used in biotechnology function is
- (A) Binding nucleotide molecule together
  - (B) Cleaving DNA molecule at certain points
  - (C) Binding amino acids together to form proteins
  - (D) Restricting entry of plasmids to cells
37. Bacteria living during earliest years of Earth belong to
- (A) Eubacteria
  - (B) Rickettsiae
  - (C) Archaeobacteria
  - (D) Clostridia
38. Enteric bacteria live in
- (A) Soil
  - (B) Nervous system
  - (C) Respiratory tract
  - (D) Intestinal tract
39. *Agrobacterium tumefaciens* causes
- (A) Decay of tooth
  - (B) Animal disease
  - (C) Plant disease
  - (D) Microbial disease
40. The following all are fungi, except
- (A) Mushrooms
  - (B) Yeasts
  - (C) Molds
  - (D) Amoebas
41. Lysogenic virus
- (A) Remain in host cell nucleus
  - (B) Multiplies after entering host cell
  - (C) Contain its own ATP for replication
  - (D) Contain enzymes for replication

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Space For Rough Work

42. Organs of body rich in mature T and B cells are
- (A) Brain and Spinal cord
  - (B) Liver and Gall bladder
  - (C) Small and Large intestines
  - (D) Spleen and Lymph nodes
43. Complement system contain series of reaction resulting in
- (A) Phagocytosis
  - (B) T-cell activity
  - (C) Antibody activity
  - (D) Activity of large foreign molecule
44. Site of T-cell maturation in human body is,
- (A) Thymus
  - (B) Brain & Spinal cord
  - (C) Tonsils and Adenoids
  - (D) Heart
45. Batch culture technique is used to
- (A) Pasteurize milk
  - (B) Produce micro organisms of industrial scale
  - (C) Perform std plate count technique
  - (D) Perform membrane filter technique
46. Relationship between microbial population and their environment is studied as
- (A) Microbial evolution
  - (B) Micro Physiology
  - (C) Micro Ecology
  - (D) Micro Biochemistry
47. Non-essential component in Nitrogen Cycle is
- (A) Calcium phosphate
  - (B) Ammonia
  - (C) Nitrate ions
  - (D) Amino acids
48. BOD determines
- (A) Pollution in waste-water
  - (B) Filtering capacity of soil
  - (C) Bacteria in water sample
  - (D) Biota in ecosystem
49. Waste-water treatment involve
- (A) Addition of chlorine
  - (B) Addition of hydrogen sulfide
  - (C) Removal of particulate matter
  - (D) Addition of phosphorus
50. Nitrogen fixing Bacteria are located in
- (A) Roots of leguminous plants
  - (B) Outer space layers
  - (C) Human intestine
  - (D) Leaf of angiosperm

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**Space For Rough Work**



PART – 2

Each question carries two marks.

(25 × 2 = 50)

51. Kary Mullis is associated with  
(A) RFLP  
(B) RAPD  
(C) PCR  
(D) SSR
52. GFP protein was originally isolated from  
(A) *Arabidopsis thaliana*.  
(B) *Aequoria victoria*.  
(C) *C. elegans*.  
(D) *Drosophila melanogaster*
53. Plasmid is used as vector because  
(A) It has antibiotic resistant gene.  
(B) It has circular DNA and joins eukaryotic DNA.  
(C) Its both ends show replication.  
(D) Its move between prokaryotic and eukaryotic cells.
54. The travel of gene expression and gene activation is measured using  
(A) Reporter gene  
(B) Marker gene  
(C) Gene sequences  
(D) Promoter element
55. DNA molecules, identical except for different numbers of superhelical turns, are called  
(A) Chain isomers  
(B) Topo isomers  
(C) Helical isomers  
(D) Geometrical isomers
56. Virus-free plants are obtained through  
(A) Embryo culture  
(B) Meristem culture  
(C) Ovule culture  
(D) Anther culture
57. Immobilized cell bioreactors are based on  
(A) Cell cultures in solid medium  
(B) Cell cultures in liquid medium  
(C) Cells entrapped in gels  
(D) All the above
58. Elicitors are substances which  
(A) Induce cell division  
(B) Stimulate production of secondary metabolites  
(C) Stimulate hairy root formation for secondary metabolite production  
(D) None of the above

Space For Rough Work

59. The modification of exogenous compounds by plant cell is called  
(A) Bio-transformation  
(B) Bio-conversion  
(C) Both (A) and (B)  
(D) Bio-remediation
60. Hairy root cultures for secondary metabolite production is induced by transforming plant cells with  
(A) *Agrobacterium tumefaciens*  
(B) *Agrobacterium rhizogenes*  
(C) Viruses  
(D) *Bacillus thuringiensis*
61. Cybrids are  
(A) Nuclear hybrids  
(B) Hybrids derived from cross pollination  
(C) Cytoplasmic hybrids  
(D) Cytological hybrids
62. Variation in *in vitro* culture is called  
(A) *in vitro* variation  
(B) Mutation  
(C) Somaclonal variation  
(D) All of the above
63. Interferons are  
(A) Antibacterial proteins  
(B) Antiviral proteins  
(C) Bacteriostatic proteins  
(D) All of the above
64. The technique used for rapid multiplication and production of animals having desired genotype is  
(A) Protoplast fusion and embryo transfer  
(B) Hybrid selection and embryo transfer  
(C) *in vitro* fertilization and embryo transfer  
(D) All of the above
65. Protein purification refers to  
(A) Purification of proteins  
(B) Separation of proteins from other biomolecules  
(C) Separation of particular protein from other contaminating protein  
(D) Purification of amino acids
66. Transgenic Golden rice has improved trait with  
(A) Insect resistance  
(B) High protein content  
(C) High vitamin content  
(D) High lysine content
67. DNA fingerprinting refer to  
(A) Technique used for identification of fingerprints of individuals  
(B) Molecular analysis of profiles of DNA samples  
(C) Analysis of DNA samples using imprinting devices  
(D) Techniques used for molecular analysis of DNA specimens

Space For Rough Work

68. Monoclonal antibodies are
- (A) Obtained from one parent and for one antigen
  - (B) Obtained from many parent and for many antigens
  - (C) Obtained from different parent and for one antigen
  - (D) Obtained from one parent and for many antigens
69. Bacteria useful in genetic engineering experiments are
- (A) Nitrobacter and Azatobacter
  - (B) Rhizobium and Diplococcus
  - (C) Nitrosomonas and Klebsiella
  - (D) Escherichia and Agrobacterium
70. Probiotics are
- (A) Cancer inducing microbes
  - (B) Safe antibiotics
  - (C) New kind of food allergen
  - (D) Live microbial food supplement
71. Gene cloning means
- (A) Production of mutated genes
  - (B) Production of wild genes
  - (C) Production of dominant genes
  - (D) Production of large populations of desired DNA fragments
72. DNA extraction from plant tissues are difficult due to
- (A) Presence of large amount of DNA
  - (B) Presence of large amount of RNA along with DNA
  - (C) Both (A) and (B)
  - (D) Presence of secondary metabolites and polysaccharides
73. Molecular markers are used to construct
- (A) Chromosome maps
  - (B) Cytogenetic maps
  - (C) Physical maps
  - (D) All of the above
74. In which of the following separation method the proteins are separated based on their net charge ?
- (A) Affinity chromatography
  - (B) Ion exchange chromatography
  - (C) Dialysis
  - (D) Gel filtration chromatography
75. A synchronous culture is one where majority of cells proceed through
- (A) Lag phase
  - (B) Log phase
  - (C) Exponential phase
  - (D) All the phases of cell cycle (G1, S, G2 and M)

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Space For Rough Work

## Space For Rough Work

