

M.Sc. APPLIED MICROBIOLOGY ENTRANCE TEST-2014

POST GRADUATE DEPARTMENT OF BOTANY
UTKAL UNIVERSITY, VANIVIHAR, BHUBANESWAR-751004

Name of the Candidate:.....

Entrance Roll No.....

Answer copy No.....082.....

Date.....

Signature of Invigilator

Full Marks : 100

Time : 01 hour

INSTRUCTIONS

5. Answer all questions.
6. The questions are of equal value.
7. There is no negative mark for giving wrong answers.
8. The questions are of multiple choice type. Write the most appropriate answer out of four choices (a), (b), (c) and (d) given for the respective question, on the answer sheet as shown below in the example.

Example

Question 1: Four multiplied by four is

- a. 4 b. 16 c. 18 d. 20

Q. No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Answer	b																			

****Important-** Please write the answer exactly the way it is shown above in the example. Writing more than one answer will be treated as wrong /cancelled

"Space for rough work is given at the end of this booklet"

Wish you Best of Luck

1. When a bacterial cell and mitochondria are treated with cyanide and carbon monoxide what happens initially?
 - (a) Respiration stops
 - (b) Photosynthesis stops
 - (c) Protein synthesis stops
 - (d) No effect occurs

2. Which virus was first observed?
 - (a) Hepatitis Virus
 - (b) TMV
 - (c) Cauliflower mosaic virus
 - (d) None of these

3. Cell cycle can be regulated by:
 - (a) Cyclins
 - (b) CDKs
 - (c) Cyclins and CDKs
 - (d) None of these

4. A cell becomes flaccid when placed in a:
 - (a) Isotonic solution
 - (b) Hypertonic solution
 - (c) Hypotonic solution
 - (d) Normal solution

5. A mutation causing a substitution of one amino acid is called:
 - (a) Point mutation
 - (b) Silent mutation
 - (c) Missense mutation
 - (d) None of these

6. The formation spindle fibres in the process of cell division is prevented by:
 - (a) Colchicine
 - (b) ATP
 - (c) Hydrazine
 - (d) All of these

7. Cerebral malaria is caused by:
 - (a) *Plasmodium vivax*
 - (b) *Plasmodium ovale*
 - (c) *Plasmodium falciparum*
 - (d) *Plasmodium malariae*

8. Ergot disease is caused by:
 - (a) *Puccinia*
 - (b) *Rhizopus*
 - (c) *Claviceps*
 - (d) *Penicillium*

9. Mycotoxins are produced by:
 - (a) Bacteria
 - (b) Fungi
 - (c) Algae
 - (d) Protozoans

10. The main product of glycolysis under aerobic conditions is:
 - (a) Pyruvate
 - (b) Lactate
 - (c) None of these
 - (d) Both a and b

11. The protein moiety of an enzyme is known as:
 - (a) Holoenzyme
 - (b) Apoenzyme
 - (c) Coenzyme
 - (d) Enzyme

12. The following organisms have been proposed as sources of single cell protein:

(a) Bacteria	(b) Yeasts
(c) Algae	(d) All the three

13. Nitrites are oxidized to nitrates by which of the following microorganisms?

(a) <i>Nitrosomonas</i>	(b) <i>Nitrosococcus</i>
(c) <i>Nitrobacter</i>	(d) <i>Azotobacter</i>

14. The major constituents in agar are:

(a) Fats	(b) Amino acids
(c) Polysaccharides	(d) Polypeptides

15. The first phase of a growth curve is:

(a) Log phase	(b) Lag phase
(c) Stationary phase	(d) Both a and b

16. The cellular generation time is:

- (a) The time required for the cell to divide
- (b) The total division of the cell during its life time
- (c) The total number of cells formed
- (d) None of these

17. The genetic material in HIV is:

- (a) ds DNA
- (b) ss RNA
- (c) ds RNA
- (d) None of these

18. PolyA tail is frequently found in:

- (a) Histone mRNA
- (b) Bacterial RNA
- (c) Eukaryotic RNA
- (d) tRNA

19. In which medium the hybridoma cells grow selectively?

- (a) Polyethylene glycol
- (b) Hypoxanthine aminopterin thymidine
- (c) Hypoxanthine-guanine phosphoribosyl transferase
- (d) Both b and c

20. The enzymes which are commonly used in genetic engineering are:

- (a) Exonuclease and ligase
- (b) Restriction endonuclease and polymerase
- (c) Ligase and polymerase
- (d) Restriction endonuclease and ligase

21. Humans normally have 46 chromosomes in skin cells. How many autosomes would be expected in a kidney cell?

- (a) 46
- (b) 23
- (c) 47
- (d) 44

22. The smallest unit of genetic material that can undergo mutation is called:

- (a) Gene
- (b) Cistron
- (c) Replicon
- (d) Muton

23. A gene that codes a polypeptide is a:

- (a) Structural gene
- (b) Regulator gene
- (c) Operator gene
- (d) Promoter gene

24. During cell cycle DNA replicates during:

- (a) G1 – phase
- (b) S – phase
- (c) G2 – phase
- (d) M – phase

25. Crossing over most commonly occurs: During:

- (a) Prophase I
- (b) Prophase II
- (c) Anaphase I
- (d) Telophase II

26. The best mode of DNA replication is:

- (a) Conservative
- (b) Semiconservative
- (c) Dispersive
- (d) None of the a,b,c

27. Synthesis of RNA from DNA is called:

- (a) Translation
- (b) RNA splicing
- (c) Transcription
- (d) Transposition

28. Nucleic acids contain:

- (a) Alanine
- (b) Adenine
- (c) Lysine
- (d) Arginine

29. The pitch of each turn in the helical strand of DNA is:

- (a) 20 Angstroms
- (b) 34 Angstroms
- (c) 28 Angstroms
- (d) 42 Angstroms

30. Western blotting is a technique used in the detection of:

- (a) DNA
- (b) RNA
- (c) Protein
- (d) Polysaccharides

31. In an antigen haptens are:

- (a) Immunogenic
- (b) Non-immunogenic
- (c) Antigenic
- (d) None of these

32. The antibody that is first formed after infection is:
 (a) IgG (b) IgM
 (c) IgD (d) IgE
33. Antibodies in our body are produced by:
 (a) B-lymphocytes (b) T-lymphocytes
 (c) Monocytes (d) RBCs
34. AIDS disease is caused by a virus which belongs to:
 (a) Retro virus group
 (b) Rhabdo virus group
 (c) Hepatitis virus group
 (d). Adeno virus group
35. Reverse transcriptase is an enzyme involved in the synthesis of
 (a) DNA (b) Soluble RNA
 (c) mRNA from DNA (d) Nucleotides
36. The cellular immune response is mediated by:
 (a) B cells (b) T cell
 (c) Natural killer cells (d) Endothelial cells
37. Which of the following techniques can effectively detect the presence of antigen/antibody?
 (a) ELISA (b) CFT
 (c) Neutralization (d) Agglutination
38. Food poisoning is caused by:
 (a) *Clostridium tetani*
 (b) *Clostridium welchi*
 (c) *Corynebacterium diphtheriae*
 (d) *Clostridium botulinum*
39. Aflatoxin is produced by:
 (a) *Aspergillus sps* (b) *Penicillium sps*
 (c) *Alternaria sps* (d) None of these
40. Penicillin was discovered by:
 (a) Flemming (b) Pasteur
 (c) Koch (d) None of these
41. An organism that is osmophilic and has a specific requirements for sodium chloride:
 (a) Halophile (b) Basophile
 (c) Barophile (d) Xerophile
42. A large culture vessel providing optimum condition necessary for the growth of desired microorganisms is called:
 (a) Bioreactor (b) Autoreactor
 (c) Impeller (d) Sparger
43. *Clostridium acetobutylicum* is used for the production of:
 (a) Acetone – Butanol
 (b) Ethanol
 (c) Vitamin- B12
 (d) None of these
44. Which of the following can provide naturally acquired passive immunity for the new born:
 (a) IgA (b) IgG
 (c) IgE (d) IgM
45. Citric acid is used as:
 (a) Flavouring agent in food
 (b) As an antioxidant
 (c) As preservative
 (d) All of the above
46. The strain of fungi used for the large scale production of penicillin is:
 (a) *Penicillium chrysogenum*
 (b) *Penicillium notatum*
 (c) *Streptomyces aureus*
 (d) *Saccharomyces cerevisiae*
47. Bacilli Calmette Guerin (BCG) contains the avirulent strains of:
 (a) Human tubercle bacilli
 (b) Avian tubercle bacilli
 (c) Bovine tubercle bacilli
 (d) A typical mycobacteria

48. Tumor inducing plasmids are extensively used in production of:
- Avirulent phases
 - Single cell proteins
 - Transgenic plants
 - Nitrogen fixing bacteria
49. Viruses that infect bacteria are:
- Cyanophages
 - Commensals
 - Bacteriophages
 - None of these
50. Bacteria that are responsible for fermentation of milk are:
- Azetobacter*
 - Rhizobium*
 - Lactobacillus*
 - Hay bacillus*
51. The enzyme needed in biological systems for joining two DNA molecules is called:
- Lyase
 - Lipase
 - Ligase
 - Lipoxygenase
52. Mesosomes are the part of:
- Plasma membrane
 - ER
 - Lysosomes
 - Golgi
53. Enzyme hydrolyzing bacterial cell wall:
- Lysozyme
 - Reductase
 - Protease
 - Lysosome
54. Which one of the following bacteria has found extensive use in genetic engineering work in plants?
- Clostridium septicum*
 - Xanthomonas oriza*
 - Bacillus coagulens*
 - Agrobacterium tumefaciens*
55. Bacteriophage lytic phase can be regulated by:
- cl*
 - cro* protein
 - both of the a & b
 - None of the a & b
56. Recombination in bacteria occurring via the phages is:
- Conjunction
 - Transduction
 - Transformation
 - Transfection
57. Mordant used in grams staining is:
- Crystal violet
 - Iodine
 - Saffranin
 - All of these
58. The bacterial cell wall contains a large pore like structure which is also a part of eukaryotic mitochondrial outer membrane. The protein is called as:
- TIM
 - Porins
 - TOM
 - LPS
59. The differences between Gram positive and Gram negative bacteria is shown to reside in the:
- Cell wall
 - Nucleus
 - Cell membrane
 - Mesosomes
60. Mycobacteria can be stained by:
- Gram's staining
 - Simple staining
 - Negative staining
 - Acid fast staining
61. The nodule forming bacteria are:
- Azotobacter*
 - Nitrobacter*
 - Clostridium*
 - Rhizobium*
62. *Nitrosomonas* and *Nitrobacter* are:
- Ammonifying bacteria
 - Denitrifying bacteria
 - Nitrifying bacteria
 - Nitrogen fixing bacteria
63. *Anabaena*, a N_2 fixer can symbiotically fix N_2 with:
- Marsilea*
 - Salvinia*
 - Pistia*
 - Azolla*

64. To fix one molecule of nitrogen:
 (a) 6 ATP molecules are required
 (b) 12 ATP molecules are required
 (c) 16 ATP molecules are required
 (d) 20 ATP molecules are required
65. Sphingosine is *not* a component of:
 (a) cardiolipin (b) ceramide
 (c) cerebrosides (d) sphingomyelin
66. Leghaemoglobin creates:
 (a) Anaerobic condition for optimum activity of nitrogenase
 (b) Aerobic condition for optimum activity of nitrogenase
 (c) Required oxygen concentration for optimum activity of nitrogenase
 (d) Suitable environment for nodule formation
67. Which of the following vitamins is water soluble as well as anti-oxidant?
 (a) Vitamin-B1 (b) Vitamin-A
 (c) Vitamin-D (d) Vitamin-C
68. ΔG is negative
 (a) the reaction is in equilibrium
 (b) the reaction is spontaneous
 (c) the reaction does not occur in forward direction
 (d) the reaction may occur in forward or reverse direction
69. An example of a glycerophospholipid that is involved in cell signaling is:
 (a) Arachidonic acid
 (b) Ceramide
 (c) Phosphatidyl inositol
 (d) Testosterone
70. The Bax tumor-suppressor protein promotes:
 (a) Unscheduled entry into S phase
 (b) Attachment of the kinetochores to the spindle
 (c) Apoptosis
 (d) Overexpression of cyclin D
71. What is true for apoptosis? It
 (a) is the normal physiological process of programmed cell death
 (b) occurs only in old age
 (c) results in products that are removed by phagocytosis
 (d) causes the plasma membrane to undergo zeiosis
72. A Barr body is an example of:
 (a) constitutive euchromatin
 (b) facultative euchromatin
 (c) facultative heterochromatin
 (d) constitutive heterochromatin
73. The mobility of DNA in agarose gel electrophoresis is solely based on its:
 (a) Charge (b) Conformation
 (c) Size (d) None of these
74. DNA gyrase is inhibited by:
 (a) Streptomycin (b) Penicillin
 (c) Nalidixic acid (d) Tetracyclines
75. In a *lac* operon, a mutation is created so that lactose cannot bind with *lac* inducer. Now, if lactose is provided, what would happen to the gene expression?
 (a) The β -galactosidase will be over-expressed
 (b) *lac I* repressor will remain inactivated.
 (c) Expression of *lac* operon will remain unaffected
 (d) *lac I* repressor would remain bound to operon preventing expression

76. Which of the following molecules can be broken down into acetyl CoA and enter the citric acid cycle?
 (a) Proteins (b) Fatty acids
 (c) Pyruvate (d) All of the choices
77. In a phospholipid bilayer, the
 (a) phosphate groups are hydrophobic.
 (b) fatty acid tails are ionized.
 (c) fatty acid tails are hydrophobic.
 (d) proteins are located only between the two layers.
78. Which of these processes occurs in the cytosol?
 (a) The citric acid cycle
 (b) Glycolysis
 (c) The electron transport system
 (d) The degradation of pyruvate
79. Which process reduces molecular oxygen to water?
 (a) Citric acid cycle
 (b) Glycolysis
 (c) Electron transport system
 (d) Fermentation
80. One turn of the citric acid cycle produces:
 (a) 2 NADH, 2 FADH₂, 2 ATP /GTP
 (b) 3 NADH, 1 FADH₂, 1 ATP/GTP
 (c) 1 NADH, 3 FADH₂, 2 ATP /GTP
 (d) 3 NADH, 2 FADH₂, 1 ATP/ GTP
81. The immunoglobulin Joining chain (J-chain) is:
 (a) only produced by T-Cells
 (b) only produced by neutrophils
 (c) associated with only multimeric forms of IgM and IgA
 (d) associated with IgE for histamine release
82. The class of an immunoglobulin is determined by:
 (a) the variable region (b) the J-chain
 (c) the heavy chain (d) the carbohydrate
83. Entry of pollen tube through micropyle is termed:
 (a) Chalazogamy (b) Mesogamy
 (c) Porogamy (d) Pseudogamy
84. A mechanism that can cause a gene to move from one linkage group to another is:
 (a) Crossing over (b) Inversion
 (c) Translocation (d) Duplication
85. Process of formation of ATP from ADP during photosynthesis is referred to as:
 (a) Photophosphorylation
 (b) Photorespiration
 (c) Phosphorylation
 (d) Oxidative phosphorylation
86. Myeloma cells and lymphocytes can be fused by using:
 (a) Calcium chloride
 (b) Ethidium bromide
 (c) Polyethylene glycol
 (d) DNA polymerase
87. After a region of DNA has been replicated, _____ removes the RNA primers:
 (a) DNA polymerase I
 (b) DNA polymerase III
 (c) DNA helicase
 (d) RNA primase
88. Simultaneous movement of two molecules across a membrane in the same direction is known as:
 (a) antiport (b) symport
 (c) uniport (d) none of these

89. The "10 per cent law" is related to:
 (a) Mendelian genetics
 (b) Neo-Mendelian genetics
 (c) Energy transfer from lower trophic level to higher trophic level
 (d) Energy consumption during photosynthesis in C4 plants
90. Movement of leaves of sensitive plant, *Mimosa pudica* are due to:
 (a) Thermonasty (b) Seismonasty
 (c) Thigmonasty (d) Chemonasty.
91. What is the direct cause of cell death by diphtheria toxin?
 (a) Formation of an ion channel in the cell membrane
 (b) Inactivation of a translational elongation factor
 (c) Induction of apoptosis
 (d) None of the above
92. Respiratory center of humans is located in the:
 (a) Pneumotaxic center
 (b) Medulla oblongata
 (c) Alveoli
 (d) Cerebrum
93. How many mRNA molecules are produced from the *E.coli* tryptophan operon that encodes four enzymes of tryptophan biosynthesis pathway in 5 cistrons?
 (a) 1 (b) 3
 (c) 4 (d) 5
94. A gene showing codominance:
 (a) Has both alleles independently expressed in the heterozygote
 (b) Has one allele dominant to the other
 (c) Has alleles tightly linked on the same chromosome
 (d) Has alleles expressed at the same time in development
95. Which type of membrane transporter is the sodium potassium pump?
 (a) Passive transporter (b) ABC transporter
 (c) P type of ATPase (d) Aquaporins
96. Conjugation between an Hfr and an F⁻ cell usually results in:
 (a) Two F⁺ cells
 (b) Two F⁻ cells
 (c) An Hfr and an F⁻ cell
 (d) An Hfr cell and an F⁺ cell
97. Conversion of starch to organic acids is required for:
 (a) stomatal opening
 (b) stomatal closing
 (c) stomatal formation
 (d) stomatal activity
98. A biological cycle with a period of about 24 hours is called:
 (a) Thigmotropism
 (b) Circadian rhythm
 (c) Photoperiod
 (d) Abscission
99. Double fertilization is fusion of:
 (a) Two eggs
 (b) Two eggs and polar nuclei with pollen nuclei
 (c) One male gamete with egg and other with synergid
 (d) One male gamete with egg and other with polar nuclei
100. A chromosome has the following segments, where • represents the centromere:
 A B • C D E F G. What type of chromosome mutations are required to change this chromosome into following chromosome
 A B A B • C D E F G
 (a) Inversion (b) Duplication
 (c) Deletion (d) Translocation