

Hall Ticket Number:

Booklet Code : A

Department of Animal Sciences

ENTRANCE EXAMINATION, June 2012

M.Sc. Animal Biotechnology

Time: 2 hours

Maximum Marks: 100

**INSTRUCTIONS: PLEASE READ BEFORE ANSWERING!**

1. Enter your hall ticket number on this sheet and the (OMR) sheet.
2. Answers have to be marked on the OMR answer sheet following the instruction provided there upon.
3. Hand over both the question paper booklet and OMR answer sheet at the end of the examination.
4. All questions carry one mark each. Answer all, or as many as you can.
5. 0.33 mark will be deducted for every wrong answer
6. There are total of 12 pages in this question paper. Answer (OMR) sheet will be provided separately. Check this before you start answering.
7. The question paper consists of part "A" and part "B". The marks obtained in Part "A" will be taken in consideration in case of tie i.e., when more than one student gets equal marks, to prepare the merit list.

\*\*\*\*\*

**PART "A"**

**1. Pancreatic lipase acts upon**

A) Glycogen	B) Triglycerides
C) Disaccharides	D) Polypeptides

**2. The following phenomenon is an example of Mendelian inheritance**

A) Imprinting	B) Obesity
C) Metastasis	D) Huntington chorea

**3. Plants producing spore bearing seed without fruit and well developed vascular structure are**

A) Pteridophyta	B) Gymnosperm
C) Angiosperm	D) Bryophyta

**4. How many haploid cells are formed after two rounds of mitosis and one round of meiosis respectively?**

A) 4,4	B) 8,4
C) 0,4	D) 8,0

4-14

**5. Base hydrolysis of triglycerides is known as**

- |                   |                   |
|-------------------|-------------------|
| A) Acetylation    | B) Acidification  |
| C) Esterification | D) Saponification |

**6. Nitrifying bacteria are example of**

- |                    |                      |
|--------------------|----------------------|
| A) Photoautotrophs | B) Photoheterotrophs |
| C) Chemoautotrophs | D) Chemoheterotrophs |

**7. If crossover in one region of the chromosome affects the likelihood of another crossover event in an adjacent region of the chromosome, the phenomenon is known as**

- |                 |                                    |
|-----------------|------------------------------------|
| A) Co-dominance | B) Chromosome linkage              |
| C) Interference | D) Chromosome conformation capture |

**8. Which of the following functional group series is ranked according to increasing boiling points?**

- |  |  |
|--|--|
| A) Diethyl ether, ethane, ethanol, ethanethiol | B) Ethane, ethanol, diethyl ether, ethanethiol |
| C) Ethane, diethyl ether, ethanethiol, ethanol | D) Diethyl ether, ethane, ethanethiol, ethanol |

**9. Which one of the following statement is false with reference to contraction and relaxation of skeletal muscles?**

- |  |   |
|--|---|
| A) Release of acetylcholine at motor end plate     | B) Increased $\text{Ca}^{++}$ conductance at the end plate membrane |
| C) Generation of action potential in muscle fibers | D) Release of $\text{Ca}^{++}$ from sarcoplasmic reticulum          |

**10. What would be the pH of 0.02 M succinic acid solution taking into account both ionization.  $K_{a1} = 7 \times 10^{-5}$ ,  $K_{a2} = 3 \times 10^{-6}$ ?**

- |        |        |
|--------|--------|
| A) 2.9 | B) 3.9 |
| C) 4.9 | D) 5.9 |

**11. A living mechanical tissue is**

- |                 |                |
|-----------------|----------------|
| A) Parenchyma   | B) Collenchyma |
| C) Chlorenchyma | D) Sclrenchyma |

**12. Pepsin of gastric juice (pH 1.5) has a pI of about 1. Which of the following amino acids must be present in large numbers to give pepsin this low pI**

- |                |                |
|----------------|----------------|
| A) Arg and Lys | B) Asp and Gly |
| C) Ser and Thr | D) Gly and Ala |

**13. A bacterial toxin that causes cramps, diarrhea and nausea in gastric tract is called**

- |                |                |
|----------------|----------------|
| A) Exotoxin    | B) Endotoxin   |
| C) Immunotoxin | D) Enterotoxin |

**14. For which of the following mixtures would steam distillation be the most appropriate method of separation?**

- |                                |                            |
|--------------------------------|----------------------------|
| A) Diethyl ether and water     | B) Ethyl alcohol and water |
| C) Aniline and sodium chloride | D) Methanol and water      |

**15. Allopurinol is used to treat gout. It acts by inhibiting**

- |                        |  |
|------------------------|--|
| A) Xanthine oxidase    | B) Hypoxanthine-guanine phosphoribosyl transferase |
| C) Adenosine deaminase | D) Urate oxidase                                   |

**16. The specific absorption coefficient ( $\epsilon_{1\%}^{1\text{cm}}$ ) of glycogen-iodine complex at 450nm is 0.2. Calculate the concentration of glycogen in a solution of the iodine complex which has an absorption of 0.38 in a 3cm cuvette**

- |            |          |
|------------|----------|
| A) 0.633%  | B) 6.33% |
| C) 0.0633% | D) 63.3% |

**17. The prevention of growth or development of an organism by a substance released by another organism is called**

- |               |               |
|---------------|---------------|
| A) Inhibition | B) Antibiosis |
| C) Repression | D) Biolistics |

**18. The formation of acetyl coenzyme A from pyruvic acid is the result of its**

- |                  |                              |
|------------------|------------------------------|
| A) Reduction     | B) Dehydration               |
| C) Carboxylation | D) Oxidative decarboxylation |

**19. Which of the following statements is correct regarding nucleophiles?**

- |   |                                      |
|---|--------------------------------------|
| A) They have an overall positive charge | B) They have a lone pair of electron |
| C) They have an unpaired electron       | D) They have empty orbitals          |

**20. The placenta in humans is**

- |  |  |
|--|--|
| A) Zonary placenta with eccentric implantation       | B) Zonary placenta with superficial implantation |
| C) Discoidal placenta with interstitial implantation | D) Diffuse placenta with eccentric implantation  |

**21. Which one of the following has the maximum number of unpaired electrons?**

- |                     |                     |
|---------------------|---------------------|
| A) $\text{Mg}^{2+}$ | B) $\text{Ti}^{3+}$ |
| C) $\text{V}^{3+}$  | D) $\text{Fe}^{2+}$ |

**22. The enzyme that catalyzes the conversion of 2-phosphoglycerate to phosphoenol pyruvate is**

- |                           |                        |
|---------------------------|------------------------|
| A) Enolase                | B) Phosphofructokinase |
| C) Pyruvate decarboxylase | D) Pyruvate kinase     |

**23. Which of the following statement is correct with reference to B form of DNA ?**

- |   |  |
|---|--|
| A) Consists of 10 minor and 10 major grooves per 100bp of DNA | B) Consists of 1 minor and 10 major grooves per 100bp of DNA |
| C) Consists of 10 minor and 1 major grooves per 100bp of DNA  | D) Consists of 1 minor and 1 major groove per 100bp of DNA   |

**24. Which of the following is most resistant to oxidation?**

- |  |                                 |
|--|---------------------------------|
| A) $\text{CH}_3\text{CH}_2\text{OH}$   | B) $(\text{CH}_3)_2\text{CHOH}$ |
| C) $\text{HOCH}_2\text{CH}_2\text{OH}$ | D) $(\text{CH}_3)_3\text{COH}$  |

**25. Calculate the axial length of an  $\alpha$ -helix containing 78 amino acids**

- |                          |                           |
|--------------------------|---------------------------|
| A) 117 $^\circ\text{A}$  | B) 1.17 $^\circ\text{A}$  |
| C) 11.7 $^\circ\text{A}$ | D) 0.117 $^\circ\text{A}$ |

### PART "B"

**26. The percentage of human genome that codes for protein is**

- |           |           |
|-----------|-----------|
| A) 0-0.5% | B) 0.5-1% |
| C) 1-1.5% | D) 1.5-2% |

**27. One mole of potassium chlorate is thermally decomposed and excess of aluminium is burnt in the gaseous product. How many moles of aluminium oxide are formed ?**

- |        |      |
|--------|------|
| A) 1   | B) 2 |
| C) 1.5 | D) 3 |

**28. The method of vegetative culture is called**

- |                 |                  |
|-----------------|------------------|
| A) Pomology     | B) Olericulture  |
| C) Sylviculture | D) Arboriculture |

**29. Oxygen carrying capacity of chlorocruorin in the respiratory pigment of Annelids is associated with metallic ion**

- |       |       |
|-------|-------|
| A) Fe | B) Cu |
| C) Zn | D) Ag |

**30. The filamentous DNA and protein that can be stained in interphase nuclei is called**

- |                    |                        |
|--------------------|------------------------|
| A) Solenoid        | B) Extended nucleosome |
| C) Looped Solenoid | D) Chromatin           |

**31. Hexokinase phosphorylates glucose. The phosphorylation process**

- |   |   |
|---|---|
| A) Prevents escape of glucose from the cell             | B) Promotes membrane transport  |
| C) Accelerates its conversion into fructose 6 phosphate | D) Inhibits the conversion of glucose 6 phosphate to fructose 6 phosphate |

**32. Which of the following type of bonds/interactions contribute the least towards stabilizing the three dimensional folding of protein molecule?**

- |                             |                   |
|-----------------------------|-------------------|
| A) Hydrophobic interactions | B) Hydrogen bonds |
| C) Disulphide bonds         | D) Ester bonds    |

**33. The characteristic reaction of carboxylic acids is**

- |                           |                               |
|---------------------------|-------------------------------|
| A) Electrophilic addition | B) Electrophilic substitution |
| C) Nucleophilic addition  | D) Nucleophilic substitution  |

**34. Cellular proteins tagged with ubiquitin undergo degradation in one of the following organelles**

- |               |                |
|---------------|----------------|
| A) Phagosomes | B) Proteosomes |
| C) Endosomes  | D) Lysosomes   |

**35. Which of the following is a major unsaturated fatty acid present in corn, peanut and soybean oil?**

- |               |                        |
|---------------|------------------------|
| A) Timnodonic | B) Elaidic             |
| C) Linoleic   | D) $\alpha$ -Linolenic |

**36. The hormone for regulation of calcium and phosphate homeostasis is secreted by**

- |                    |                      |
|--------------------|----------------------|
| A) Pituitary gland | B) Parathyroid gland |
| C) Thymus gland    | D) Thyroid gland     |

**37. A plant enzyme produced in response to infection by fungal pathogen which hydrolyses some components of the fungal cell wall is**

- |                           |                           |
|---------------------------|---------------------------|
| A) Chitinase              | B) $\beta$ -1,3 Glucanase |
| C) $\beta$ -1,6 Glucanase | D) Cellulase              |

**38. The strain of yeast that is used in beer production is**

- |                                     |                                       |
|-------------------------------------|---------------------------------------|
| A) <i>Pichia pastoris</i>           | B) <i>Saccharomyces cerevisiae</i>    |
| C) <i>Saccharomyces diastaticus</i> | D) <i>Saccharopolyspora erythraea</i> |

**39. Which of the histone is not a part of the nucleosome?**

- |        |        |
|--------|--------|
| A) H1  | B) H2A |
| C) H2B | D) H4  |

**40. Which of the following organism is not recommended for production of recombinant therapeutics?**

- |                                    |                           |
|------------------------------------|---------------------------|
| A) <i>Saccharomyces cerevisiae</i> | B) <i>E. coli</i>         |
| C) <i>Pseudomonas aeruginosa</i>   | D) <i>Pichia pastoris</i> |

**41. One of the following arthropods does not serve as a vector for transmission of Rickettsial disease**

- |                       |                     |
|-----------------------|---------------------|
| A) <i>Dermacentor</i> | B) <i>Pediculus</i> |
| C) <i>Xenopsylla</i>  | D) <i>Culiseta</i>  |

**42. Following substrate capable of traversing blood brain barrier can be utilized by the brain to restore normal function during hypoglycemia**

- |            |              |
|------------|--------------|
| A) Sucrose | B) Lactose   |
| C) Mannose | D) Galactose |

**43. The factor that does not influence the heat of reaction is**

- |   |  |
|---|--|
| A) The physical state of reactants and products | B) The temperature                                     |
| C) The pressure or volume                       | D) The method by which the final products are obtained |

**44. Genetically induced dwarfness in plants can be overcome by treatment with**

- |             |                 |
|-------------|-----------------|
| A) Ethylene | B) Auxin        |
| C) ABA      | D) Gibberellins |

**45. Isozymes are**

- |  |   |
|--|---|
| A) Enzymes catalyzing same reaction with different physical properties       | B) Enzymes catalyzing same reaction with identical physical properties      |
| C) Enzymes catalyzing different reactions with identical physical properties | D) Enzymes catalyzing different reaction with different physical properties |

**46. A small protein that acts as an electron carrier**

- |                |             |
|----------------|-------------|
| A) Thrombin    | B) Thionin  |
| C) Thioredoxin | D) Triazine |

**47. Rhizopus multiplies by the production of**

- |                    |                    |
|--------------------|--------------------|
| A) Zoospores       | B) Conidiospores   |
| C) Sporangiospores | D) Chlamydo spores |

**48. The triple helix model of DNA structure was proposed by**

- |                     |                      |
|---------------------|----------------------|
| A) Watson and Crick | B) Rosalind Franklin |
| C) Linus Pauling    | D) Erwin Chargaff    |

**49. Which of the following reactions can be used to prepare alkanes?**

- |                              |                         |
|------------------------------|-------------------------|
| A) Corey-House synthesis     | B) Williamson synthesis |
| C) Friedel -Crafts reactions | D) Feulgen synthesis    |

**50. Embryonic stem cells are**

- |   |   |
|---|---|
| A) Totipotent and have non-self renewal capacity  | B) Pluripotent and have self renewal capacity |
| C) Multipotent and have non self renewal capacity | D) Multipotent and have self renewal capacity |

**51. Nephron is the structural and functional unit of kidney. Juxtamedullary nephrons are present in**

- |            |             |
|------------|-------------|
| A) Mammals | B) Reptiles |
| C) Birds   | D) Fishes   |

**52. A sample of DNA purified from *Mycobacterium tuberculosis* contains 15.1% adenine on a molar basis. What is the percentage of the Guanine present?**

- |          |          |
|----------|----------|
| A) 34.9% | B) 15.1% |
| C) 68.1% | D) 3.49% |

**53. Lyme disease is caused by**

- |                                 |                                     |
|---------------------------------|-------------------------------------|
| A) <i>Yersinia pestis</i>       | B) <i>Borrelia burgdorferi</i>      |
| C) <i>Ehrlichia chaffeensis</i> | D) <i>Anaplasma phagocytophilum</i> |

**54. Inter nucleosomal DNA is called**

- |               |                   |
|---------------|-------------------|
| A) Linker DNA | B) Linear DNA     |
| C) Junk DNA   | D) Intergenic DNA |

**55. Crown gall disease in plants is caused by infection of**

- |                    |                         |
|--------------------|-------------------------|
| A) Scale insect    | B) <i>Agrobacterium</i> |
| C) <i>Fusarium</i> | D) <i>Rhizoctonia</i>   |

**56. A genetic mutation that changes a codon for one amino acid into a codon specifying for another amino acid is**

- |                        |                      |
|------------------------|----------------------|
| A) Frameshift mutation | B) Missense mutation |
| C) Nonsense mutation   | D) Point mutation    |

**57. Coenzyme pyridoxal phosphate is derived from vitamin**

- |       |       |
|-------|-------|
| A) C  | B) B1 |
| C) B6 | D) B2 |

**58. Homolytic fission of C-C bond leads to the formation of**

- |                  |                                 |
|------------------|---------------------------------|
| A) Free radicals | B) Carbonium ions               |
| C) Carbanions    | D) Carbanion and Carbonium ions |

**59. Structures that have same evolutionary origin but differing with regard to structure and function are said to be**

- |                 |               |
|-----------------|---------------|
| A) Analogous    | B) Homologous |
| C) Heterologous | D) Contiguous |

**60. Enzyme found in saliva of animals is**

- |            |            |
|------------|------------|
| A) Patatin | B) Ptyalin |
| C) Pepsin  | D) Renin   |

**61. The movement of masses of cells towards each other and their fusion into one cell mass is called**

- |                |                 |
|----------------|-----------------|
| A) Convergence | B) Concrescence |
| C) Epiauxesis  | D) Emboly       |

**62. Which of the following is an inducer of *lac* operon?**

- |                |              |
|----------------|--------------|
| A) Lactose     | B) Galactose |
| C) Allolactose | D) Glucose   |

**63. An enzyme that selectively degrades single stranded DNA is**

- |                 |                |
|-----------------|----------------|
| A) Endonuclease | B) Exonuclease |
| C) S1 nuclease  | D) P1 nuclease |

**64. Total number of vertebra found in vertebral column of human is**

- |       |       |
|-------|-------|
| A) 18 | B) 33 |
| C) 38 | D) 42 |

**65. The common name for Indian rose wood is**

- |                     |                    |
|---------------------|--------------------|
| A) <i>Acacia</i>    | B) <i>Shorea</i>   |
| C) <i>Dalbergia</i> | D) <i>Purpurea</i> |

**66. How many different disaccharides are possible from D-galactopyranose and D-glucopyranose ?**

- |       |       |
|-------|-------|
| A) 10 | B) 20 |
| C) 5  | D) 40 |

**67. Which one of the following is not a hemoprotein?**

- |               |                       |
|---------------|-----------------------|
| A) Myoglobin  | B) Cytochrome P450    |
| C) Hemoglobin | D) Billirubin oxidase |

**68. In humans the rectus femoris muscle is found in**

- |              |              |
|--------------|--------------|
| A) Upper arm | B) Lower arm |
| C) Thigh     | D) Elbow     |



**69. Humans can digest starch and not cellulose. Both of them contain the monomeric glucose units. Starch can be digested due to the specificities of the intestinal enzymes for**

A)  $\alpha$  1→4 linkageB)  $\beta$  1→4 linkageC)  $\alpha$  1→6 linkageD)  $\beta$  1→6 linkage

**70. Transfer of electrons during photosynthesis occurs in a sequential manner. The correct order of this sequence is**

A) P700→Plastoquinone (PQ)→ Pheophytin (PE) →CytB6→Plastocyanin(PC)→P680→Ferridoxin (FD)

B) P680→PQ→PE→CytB6→PC→P680→FD

C) P680→PE→PQ→CytB6→PC→P700→FD

D) P700→PE→PQ→CytB6→PC→P680→FD

**71. Example of genomic imprinting is**

A) Prader-Willi syndrome

B) Down syndrome

C) Klinefelter syndrome

D) Turner syndrome

**72. Which of the following is ketose?**

A) Glycerose

B) Fructose

C) Ribose

D) Glucose

**73. Which of the following eukaryotic DNA polymerase plays role in mitochondrial DNA synthesis?**

A)  $\alpha$ B)  $\beta$ C)  $\gamma$ D)  $\delta$ 

**74. The decline of reptiles and expansion of mammals is characteristic of**

A) Mesozoic

B) Paleozoic

C) Archaeozoic

D) Coenozoic

**75. Which of the following characteristics features is typical for enantiomers?**

A) Rotate ordinary light

B) Have the same melting point

C) Are superimposable mirror images

D) React with the optically active molecules at the same rate

**76. The germ theory of disease was developed by**

A) Koch

B) Fleming

C) Van Leeuwenhoek

D) Pasteur

**77. Which of the following is not a rodent?**

A) Mole rat

B) Porcupine

C) Guinea pig

D) Mongoose

**78. In cold countries ethylene glycol is added to water in car radiators. This helps to**

A) Reduce the viscosity

B) Make water a better lubricant

C) Lower the freezing point

D) Lower the boiling point

**79. An extra embryonic membrane essential for gas exchange during embryonic development of amniotes is**

- |            |              |
|------------|--------------|
| A) Amnion  | B) Allantois |
| C) Chorion | D) Yolk sac  |

**80. Which of the following sterilization methods does not kill endospores?**

- |                   |                          |
|-------------------|--------------------------|
| A) Autoclave      | B) Hot air sterilisation |
| C) Pasteurisation | D) Dry air sterilisation |

**81. In glycolysis and citric acid cycle, the only dehydrogenase to use FAD as cofactor is**

- |                             |                            |
|-----------------------------|----------------------------|
| A) Isocitrate dehydrogenase | B) Succinate dehydrogenase |
| C) Pyruvate dehydrogenase   | D) Malate dehydrogenase    |

**82. Myelin producing cells in the central nervous system are**

- |                     |                    |
|---------------------|--------------------|
| A) Oligodendrocytes | B) Schwann cells   |
| C) Astrocytes       | D) Ependymal cells |

**83. Following properties will decrease with increase in temperature except**

- |                    |                    |
|--------------------|--------------------|
| A) Surface tension | B) Viscosity       |
| C) Density         | D) Vapour pressure |

**84. Which region is the most biologically diverse area on the planet?**

- |                      |                         |
|----------------------|-------------------------|
| A) Arctic tundra     | B) Tropical rain forest |
| C) Coniferous forest | D) Prairie grassland    |

**85. Relaxed plasmid is a**

- |                                      |                                 |
|--------------------------------------|---------------------------------|
| A) Plasmid found in open circle form | B) Plasmid found in Linear form |
| C) Low copy number plasmid           | D) High copy number plasmid     |

**86. The free energy change,  $\Delta G$ :**

- |  |                                    |
|--|------------------------------------|
| A) Is directly proportional to the standard free energy change, $\Delta G^0$                 | B) Is equal to zero at equilibrium |
| C) Can only be calculated when the reactant and products are present at 1mol/L concentration | D) Is equal to $-RT/nK_{eq}$       |

**87. During embryonic development the Anti-Mullerian Factor or Anti-Mullerian Hormone (AMH) performs the following function**

- |  |  |
|--|--|
| A) Prevents formation of vas efferens and vas deferens | B) Promotes formation of vas efferens and vas deferens |
| C) Prevents formation of oviducts and uterus           | D) Promotes formation of oviducts and uterus           |

**88. The appearance of silver mirror in Tollen's test indicates the presence of**

A) An aldehyde

B) A ketone

C) An alcohol

D) An alkene

**89. Compared to herbivores, carnivores intestine is generally**

A) Longer

B) More convoluted

C) Less convoluted

D) About the same size

**90. Which of the following ecosystems is called as "Taiga"?**

A) Boreal forest

B) Littoral forest

C) Tropical rain forest

D) Tundra

**91. Laron syndrome is due to an autosomal recessive disorder occurring in consanguineous families and affected individuals are resistant to**

A) Growth hormone

B) Melatonin

C) Prolactin

D) Serotonin

**92. A gas of pressure 5 atm is heated from 0°C to 546°C and simultaneously compressed to one-third of its original volume. Hence, final pressure is**

A) 10 atm

B) 30 atm

C) 45 atm

D) 5 atm

**93. Antibiotic puromycin inhibits protein synthesis by**

A) Preventing amino acyl tRNA to the A site of the ribosome

B) Preventing the formation of covalent linkage between tRNA and amino acid

C) Binding to 30S subunit of the ribosome and preventing the process of elongation

D) Binding to elongation factor G

**94. How many different aldohexose stereoisomer are possible excluding anomers?**

A) 24

B) 16

C) 8

D) 4

**95. An unicellular heterotroph has a nucleus, 70S ribosome but does not have golgi apparatus. Which one of the following taxonomic classification best suits the description**

A) Fungi

B) Eubacteria

C) Archezoa

D) Animalia

**96. A lake rich in nutrients and algal species is classified as**

A) Dystrophic

B) Oligotrophic

C) Eutrophic

D) Ectotrophic

**97. In the absence of glycocholic acid and taurocholic acid, the intestinal absorption of all the following would be impeded except**

- |                |               |
|----------------|---------------|
| A) Vitamin C   | B) Oleic acid |
| C) Cholesterol | D) Vitamin A  |

**98. Shingles is a disease caused by**

- |                   |                     |
|-------------------|---------------------|
| A) Smallpox virus | B) Chickenpox virus |
| C) Adenovirus     | D) Poliovirus       |

**99. It is possible to distinguish between optical isomers**

- |                           |                         |
|---------------------------|-------------------------|
| A) By using chemical test | B) By mass spectrometry |
| C) By IR spectroscopy     | D) By polarimetry       |

**100. Which is a part of blood buffer?**

- |   |  |
|---|--|
| A) $\text{HCO}_3^-$ , $\text{H}_2\text{CO}_3$           | B) $\text{CO}_3^{2-}$ , $\text{HCO}_3^-$ |
| C) $\text{CH}_3\text{COOH}$ , $\text{CH}_3\text{COO}^-$ | D) $\text{SO}_4^{2-}$ , $\text{HSO}_4^-$ |

For rough work