

Hall Ticket Number:
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Department of Animal Sciences

ENTRANCE EXAMINATION, June 2012  
Ph. D Animal Sciences

Time: 2 hours

Maximum Marks: 75

**INSTRUCTIONS: PLEASE READ BEFORE ANSWERING**

1. Enter your hall ticket number on this sheet and the answer (OMR) sheet.
2. Answers have to be marked on the OMR sheet with ball point pen (Blue/Black) following instructions provided there upon.
3. All questions carry equal marks..
4. 0.33 marks will be deducted for every wrong answer.
5. There are total of 10 pages in this question paper booklet including space for rough work. Check the question paper thoroughly before answering.
6. The question paper consists of part "A" and part "B". The marks obtained in Part "A" will be considered for the preparation of the merit list when two or more students get equal marks.

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**PART "A"**

1. What is the concentration of  $H^+$  in a solution of 0.1M NaOH?
 

A) $10^{-12}$ M	B) $10^{-13}$ M
C) $10^{-14}$ M	D) $10^{-10}$ M
2. How many ATP are produced during oxidation of one molecule of palmitic acid?
 

A) 120	B) 140
C) 130	D) 150
3. Which of the following is not a metalloprotein?
 

A) Phytochrome	B) Hemoglobin
C) Cytochrome	D) Erythropoietin
4. In bacteria, which of the following is not an effector?
 

A) cAMP	B) L-Arabinose
C) Allolactose	D) Lactose

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**5. Which one of the following inhibits platelet aggregation?**

- A) Leukotriene A4
- B) Prostacyclin
- C) Thromboxane A2
- D) Prostaglandin H2

**6. One of the following is an 'endangered species'**

- A) *Cycas beddomei*
- B) *Santalum album*
- C) *Petrocarpus marsupium*
- D) *Terminalia bellerica*

**7. The antistreptolysin O titer is raised in infections caused by**

- A) *Streptococcus sanguis*
- B) *Streptococcus pneumonia*
- C) *Streptococcus bovis*
- D) *Streptococcus pyogenes*

**8. The role of blood cells in phagocytosis was first demonstrated by**

- A) Louis Pasteur
- B) Robert Koch
- C) Elie Metchinkoff
- D) Charles Chamberland

**9. Aromatase enzyme converts**

- A) Estradiol to testosterone
- B) Testosterone to estradiol
- C) Estrogen to progesterone
- D) Progesterone to estradiol

**10. Chemoautotrophs obtain energy by oxidizing inorganic compounds. What is their source of carbon?**

- A) Glucose
- B) Lactose
- C) CO<sub>2</sub>
- D) They require no carbon source

**11. Which of the amino acids is coded by only a single codon?**

- A) Glutamine
- B) Tryptophan
- C) Asparagine
- D) Isoleucine

**12. *Rickettsia rickettsii* is responsible for**

- A) Q-fever
- B) Rocky Mountain Spot fever
- C) Lyme disease
- D) Typhoid fever

**13. Serglycan is a proteoglycan expressed exclusively in**

- A) Tendon
- B) Fibroblast
- C) White blood cells
- D) Embryonic epithelia

**14. Which of the following introduces flagellated promastigotes into the skin of host?**

- A) Mosquito
- B) Deer tick
- C) Sand fly
- D) Buffalo gnat

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**15. Which of the following is the function of the contractile vacuole?**

- A) Site of food digestion                      B) Contain specific enzymes that perform various functions  
C) Maintain osmotic balance by continuous water expulsion                      D) Site for photosynthesis

**16. The term Variolation refers to**

- A) Generation of antibody variable regions                      B) The attenuation of virulent organisms  
C) Inoculation of scab material into small skin wounds                      D) Removal of scab material from an individual with smallpox

**17. Upon successful invasion of the pathogen, disease is progressed through a series of stages. Which of the following indicates correct order?**

- A) Prodermal, incubation, acute, convalescent, decline                      B) Incubation, acute, prodernal, convalescent, decline  
C) Incubation, prodermal, acute, decline, convalescent                      D) Prodermal, convalescent, incubation, acute, decline

**18. Defects in Neutrophil NADPH Oxidase system produce**

- A) Chediak-Higashi disease                      B) Hashimoto's disease  
C) Chronic granulomatous disease                      D) Streptococcal infection

**19. Which one of the following protozoan infection is detected by Sabin-Feldman dye test?**

- A) Trichomonas sp.                      B) Toxoplasma sp.  
C) Giardia sp.                      D) Cryptosporidium sp.

**20. Merozoites are stored in merozoon. Membrane of merozoon is derived from**

- A) Hepatocyte plasma membrane                      B) *Plasmodium* plasma membrane  
C) Mitochondrial membrane of hepatocytes                      D) Plasma membranes derived from hepatocyte and *Plasmodium*

**21. Circular RNA virus is**

- A) Hepatitis A virus                      B) Hepatitis B virus  
C) Hepatitis C virus                      D) Hepatitis D virus

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**22. Immunoglobulin that is present at highest concentration in normal individuals**

- A) IgM  
B) IgG  
C) IgD  
D) IgE

**23. Lesions of corner of mouth, lips and tongue are caused by deficiency of**

- A) Riboflavin  
B) Thiamin  
C) Calciferol  
D) Cobalamine

**24. Which one of the following does not derive from monocyte-macrophage lineage?**

- A) Follicular dendritic cells of lymph nodes  
B) Neutrophils  
C) Kupffer cells in liver  
D) Monocytes in blood

**25. DNA content per cell is highest in**

- A) Cells of Klinefelter syndrome individual  
B) Cells of Down syndrome male individual  
C) Cells of Down syndrome female individual  
D) Cells of Cri-du-chat syndrome female individual

### PART "B"

**26. In an *in vitro* transcription assay  $\gamma$ -P<sup>32</sup>-labelled NTPs are used. Which of the following statements is correct if transcription takes place in a 5' → 3' direction?**

- A) Transcript remains unlabelled  
B) Transcript will be labeled and the amount of radioactivity remains constant  
C) Transcript will be labeled and the amount of radioactivity gets constantly increased  
D) There will be an initial increase in radioactivity incorporation followed by sudden decrease

**27. Which organization is concerned with 'biodiversity hotspots'?**

- A) Conservation International  
B) United Nations  
C) WWF  
D) IUCN

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**28. Di George Syndrome results from a defect in**

- A) Purine nucleoside phosphorylase  
 B) Thymic development  
 C) CD3  
 D) WASP

**29. The nature of Pathogen Associated Molecular Pattern (PAMP) that bind to human Toll-like Receptor -3 (TLR-3) located on phagosome membrane is**

- A) Single stranded RNA of viruses  
 B) LPS from Gram negative bacterial cell wall  
 C) Double stranded RNA of viruses  
 D) Peptidoglycan from Gram positive cell wall

**30. Integrins are a family of cell surface proteins that mediate adhesion between cells and extracellular matrix. Which of the following is not an integrin?**

- A) CR3  
 B) CD11b  
 C) CD34  
 D) CD29

**31. The effector function of an eosinophil is**

- A) Phagocytosis  
 B) Killing of antibody coated parasites  
 C) Activation of bactericidal mechanisms  
 D) Release of granules containing histamine

**32. Terminal portion of *Drosophila* embryonic head which includes brain**

- A) Acron  
 B) Cephalon  
 C) Telson  
 D) Coxa

**33. The four cells produced during spermatogenesis will have**

- A)  $2n$  number of chromosomes and will differ genetically from each other  
 B)  $n$  number of chromosomes and will be genetically identical to each other  
 C)  $2n$  number of chromosomes and will be genetically identical to each other  
 D)  $n$  number of chromosomes and will differ genetically from each other

**34. Which of the following gets activated by Diacylglycerol**

- A) Protein Kinase C  
 B) Tyrosine Kinase  
 C) Protein Kinase A  
 D) MAP Kinase

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**35. What is the characteristic form introns have after being cut from a pre-mRNA**

- A) Circular form
- B) Lariat shaped
- C) Linear form
- D) Theta structure

**36. At high concentration of substrate, enzymes usually follow the kind of rate reaction**

- A) Zero order kinetics
- B) First order kinetics
- C) Second order kinetics
- D) None of these

**37. Immunity gained by a vaccine is**

- A) Natural active
- B) Natural passive
- C) Artificial active
- D) Active Passive

**38. Which one of the following is a noncoding long regulatory RNA?**

- A) sRNA
- B) Xist RNA
- C) Insulin HnRNA
- D) Micro RNA

**39. The phenomenon of Transvection is first observed in which organism**

- A) *Homo sapiens*
- B) *Mus musculus*
- C) *Drosophila melanogaster*
- D) *Caenorhabditis elegans*

**40. Bovine spongiform encephalopathy (BSE) is associated with misfolding of**

- A) Prion
- B) Myelin basic protein (MBP)
- C) GABA
- D) Alpha-synuclein

**41. What is the genotype of the patients with Turner's syndrome**

- A) XY
- B) XO
- C) YO
- D) XXO

**42. The pituitary protein that binds and inactivates activin is**

- A) Inhibin
- B) Luteinizing hormone
- C) Follistatin
- D) Follicle Stimulating Hormone

**43. A cross is made between two individuals of genotype AABbCcDDee and AABbccDdee. What is the probability of producing the genotype AAbbccDDEe?**

- A) 1/4
- B) 1/8
- C) 1/16
- D) 0

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- 44. The condition caused by retrograde flow of blood into the internal spermatic vein resulting in the dialation of peritesticular vein is**
- A) Cryptorchidism
  - B) Virilisation
  - C) Amyloidosis
  - D) Varicocele
- 45. Husband and wife are heterozygous recessive for albinism. If dizygotic (two-egg) twins are born to them, what is the probability of having same phenotype for pigmentation?**
- A) 1/4
  - B) 1/8
  - C) 5/8
  - D) 1/2
- 46. A population can only be in genetic equilibrium under conditions laid out in**
- A) The Hardy-Weinberg Law
  - B) The Watson-Crick Law
  - C) The Huxley-Darwin Law
  - D) The McClintok-Morgan Maxim
- 47. Gluconeogenesis is the process involved in the conversion of pyruvate to glucose. The process exclusively occurs in**
- A) Cytoplasm
  - B) Mitochondria
  - C) Plasma membrane
  - D) Endoplasmic reticulum
- 48. Which of the following form is responsible for the transport of dietary lipids from intestine?**
- A) Free fatty acid
  - B) Mixed micelles
  - C) Free triglycerides
  - D) Chylomicrons
- 49. The following are the human pathogens. Which one of them is responsible for Whooping Cough?**
- A) *Bordetella pertusis*
  - B) *Corynebacterium diphtheriae*
  - C) *Mycobacterium tuberculosis*
  - D) *Bordetella bronchiseptica*
- 50. Animal diseases that can be transmitted to humans are termed as**
- A) Zoonoses
  - B) Enzootic
  - C) Epizootic
  - D) Panzootic
- 51. Paracrine factors that guide axonal growth cone and play important role in axonal migration**
- A) Neuropilin (neural crest migration)
  - B) Neurotrophin (chemoattractant)
  - C) Neurotrophin (growth factor, keep neurons alive)
  - D) Nectrin

**52. The enzyme hemolysin is secreted by all the bacteria except**

- A) Pneumococci
- B) Clostridia
- C) Staphylococci
- D) Streptococci

**53. The following cells are not involved in phagocytosis**

- A) Microglial cells
- B) Macrophages
- C) Neutrophils
- D) Natural-Killer cells

**54. The class of immunoglobulin is determined by**

- A) The J-chain
- B) The variable chain
- C) The T3-polypeptide complex chain
- D) The heavy chain

**55. TH cells are known to recognize the following antigen presenting cells**

- A) HLA Class I antigen
- B) HLA class II antigen
- C) Processed antigen
- D) CD8 antigen

**56. About 1000 (one thousand) *E. coli* cells were inoculated into a fresh LB medium. If the cells are allowed to grow for 10 generations what would be the total cell count?**

- A)  $1000 \times 2^{10}$
- B)  $1000 \times 10 \times 2$
- C)  $1000 \times 2^{10} / 10$
- D)  $1000 \times 10^2$

**57. Antibiotic that resembles like a 3' end of charged tRNA molecules is**

- A) Streptomycin
- B) Tetracycline
- C) Puromycin
- D) Sparsomycin

**58. In a haploid organism the C and D loci are 8 m.u apart. From a cross Cd x cD what proportion of the progeny will be all recombinants?**

- A) 4
- B) 8
- C) 32
- D) 48

**59. The bacteria that grow in low temperature are known as**

- A) Extremophile
- B) Halophile
- C) Psychrophile
- D) Thermophile



**60. If the DNA fragment size is between 200-2000 kb, which of the following vector is suitable for construction of genomic library?**

- A) Cosmid vector                      B) BAC vector  
C) YAC vector                          D) PAC vector

**61. Male and female yellow mice are crossed over several litters, a 2:1 ratio of yellow to wild-type (agouti) pups were produced. If the symbol "Y" represents the allele associated with yellow body color, which symbols below, accurately describe the genotypes of the offspring?**

- A) Yy and yy                              B) YY and yy  
C) Yy and Yy                              D) YY and Yy

**62. Which one of the following is not part of bacterial IS elements?**

- A) Terminal inverted repeats          B) Terminal direct repeats  
C) TnPA                                      D) Drug resistant gene

**63. The leader region (trpL) of tryptophan-specific mRNA functions as**

- A) Corepressor                              B) Aporepressor  
C) Activator                                  D) Attenuator

**64. Calculate the length of double stranded DNA molecules of MW  $3 \times 10^7$**

- A) 26054                                      B) 28094  
C) 48544                                      D) 98868

**65. The work of the following scientist is associated with replication of DNA**

- A) Crick                                        B) Barbara McClintoc  
C) Stahl                                        D) Linus Pauling

**66. The molecular weight of bacteriophage T4 DNA is  $1.3 \times 10^8$ . How many different proteins of MW 55,000 (55 kDa) could be coded by T4 DNA**

- A) 153    B) 120  
C) 130    D) 123

**67. The maximal rate of protein synthesis (amino acids per second) in bacterial cells is approximately**

- A) 2    B) 3-4  
C) 12-15                                        D) 30-40

**68. Which one of the following is not associated with nucleus of the cell?**

- A) Cajol bodies  
B) PIKA  
C) PML bodies  
D) Centriole

**69. Root-like projections through which a fungus obtains nourishment from the alga in lichens are known as**

- A) Rhizoid  
B) Haustoria  
C) Pyemia  
D) Pycnidium

**70. How many biodiversity hotspots extend into India?**

- A) 2  
B) 1  
C) 3  
D) 5

**71. Which of the following is an intracellular parasite?**

- A) *Leishmania donovani*  
B) *Schistosoma mansoni*  
C) *Ascaris lumbricoides*  
D) *Enterobius vermicularis*

**72. Which of the following gives information about phenotype but not genotype?**

- A)  $X^hY$   
B) Hemophiliac man  
C) Tall pea plant  
D) Female carrier for color blindness

**73. Drug chloramphenicol blocks**

- A) Cell wall formation  
B) Transcription  
C) Translational termination  
D) Polypeptide chain elongation

**74. What is the average size of the DNA fragment generated if digested with EcoRI?**

- A)  $4^6$   
B)  $4^4$   
C)  $4^8$   
D)  $4^2$

**75. Platelets are derived from**

- A) Erythroblast  
B) Common lymphoid progenitor  
C) Megakaryocyte  
D) Plasma cells

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**For rough work**

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