

Booklet code - C

Hall Ticket Number:

Department of Animal Sciences
ENTRANCE EXAMINATION, JUNE 2011
M. Sc Animal Biotechnology

Time: 2 hours

Maximum Marks: 100

INSTRUCTIONS: PLEASE READ BEFORE ANSWERING!

- Enter your hall ticket number on this sheet and the answer (OMR) sheet.
- Answers have to be marked on the OMR answer sheet following the instruction provided there upon. Make sure that you have clearly mentioned the Code(A or B or C) on your OMR sheet.
- Hand over both the question paper booklet and OMR answer sheet at the end of examination.
- All questions carry one mark each. Answer all, or as many as you can.
- 0.33 mark will be deducted for every wrong answer.
- There are a total of **11** pages in this question paper. Answer (OMR) sheet will be provided separately. Check this before you start answering.
- 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. The complete aerobic respiration of glucose produces

- | | |
|-------------------------------|-----------------------------|
| A) Lactate and carbon dioxide | B) Lactate and oxygen |
| C) Water and oxygen | D) Water and carbon dioxide |

2. The drug which selectively inhibits DNA polymerases and blocks DNA synthesis-

- | | |
|-----------------------|------------------|
| A) α -Amanitin | B) Rifampicin |
| C) Aphidicolin | D) Actinomycin D |

3. The fetal placenta and umbilical cord are formed from the

- | | |
|--------------------------|------------------------|
| A) Chorion & endometrium | B) Chorion & allantois |
| C) Chorion & yolk sac | D) Chorion & amnion |

4. Gram positive cells have

- | | |
|---|--|
| A) Multiple layer of peptidoglycan that help to retain the crystal violet stain | B) A second outer membrane that helps to retain the crystal violet stain |
| C) A periplasmic space that traps the crystal violet stain | D) A thick capsule that traps the crystal violet stain |

V-15

Booklet code - C

5. Which of the following techniques are used for the analysis of restriction fragment length polymorphisms?

- A) Restriction enzyme digestion & electrophoresis
 B) Electrophoresis & chromatography
 C) Methylation & Restriction enzyme digestion
 D) Restriction enzyme digestion & chromatography

6. Lipid A stimulates the synthesis of which factor?

- A) Transforming growth factor (TGF)
 B) Tumor necrosis factor (TNF)
 C) Platelet derived growth factor (PDGF)
 D) Epidermal growth factor (EGF)

7. The only living echinoderms which are fully sessile

- A) Sea urchins
 B) Sea lilies
 C) Sand dollars
 D) Sea cucumbers

8. Which one of the following agent is commonly used for determining the N-terminal amino acid of a polypeptide?

- A) Trypsin
 B) Aminopeptidase
 C) Cyanogen bromide
 D) Phenyl isothiocyanate

9. The Michaelis-Menten constant K_m is

- A) Numerically equal to $\frac{1}{2} V_{max}$
 B) Numerically equal to substrate concentration that gives half-maximal velocity
 C) Independent of pH
 D) Dependent on the enzyme concentration

10. The unfertilized eggs laid by queen bee develop into

- A) Drones
 B) Workers
 C) Hermaphrodite
 D) Queens

11. The chromosome composition seen in different syndromes is given below. Identify the pair that is mismatched.

- A) Turner's syndrome - 45 (AA+XO)
 B) Klinefelter's syndrome - 47 (AA+XXY)
 C) Patau's syndrome - 45: Monosomy of 13th chromosome
 D) Down's syndrome - 47: Trisomy of 21st chromosome

12. Which one of the following sequences shows the correct hierarchy of classification, going from the most inclusive to the least inclusive?

- A) Kingdom, phylum, order, class, family, genus, species
 B) Kingdom, class, order, family, genus, species
 C) Kingdom, phylum, class, order, family, genus, species
 D) Kingdom, order, phylum, class, family, genus, species

13. Silicon is a

- A) Insulator
 B) Semiconductor
 C) Conductor
 D) Non-conductor

14. Which of the following disease is not caused by bacteria?

- A) Plague
B) Tuberculosis
C) Cholera
D) Yellow fever

15. If an affected male has all affected daughters, but no affected sons, the trait is likely to be an

- A) X-linked recessive trait
B) X-linked dominant trait
C) Autosomal dominant trait
D) Autosomal recessive trait

16. The molarity of a solution containing 5.844 gram NaCl in 100 mL is

- A) 0.01 M
B) 1 M
C) 0.1 M
D) 10 M

17. The phylum of plants that includes mosses is

- A) Anthocerophyta
B) Lycophyta
C) Pterophyta
D) Bryophyta

18. The premature aging syndrome caused due to the mutation in DNA repair enzymes is

- A) Schizophrenia
B) Hutchinson-Gilford Progeria
C) Aphasia
D) Dementia

19. Which one of the following pairs are analogous structures?

- A) The wings of bird and butterfly wings
B) The front leg of frog and a bat wing
C) The front leg of horse and a human arm
D) The front flipper of a whale and a human arm

20. Hydrolysis of one ATP molecule to ADP releases _____ calories of energy.

- A) 730
B) 7,300
C) 68,600
D) 73,000

21. Which one of the following DNA duplex has highest melting temperature?

- A) 5' ATGGCTCGT 3'
3' TACCGAGCA 5'
B) 5' ATGGGCCCTG 3'
3' TACCCGGGAC 5'
C) 5' ATGATACTG 3'
3' TACTATGAC 5'
D) 5' GGCTGGAGA 3'
3' CCGACCTCT 5'

22. Receptors for which of the following hormones are found in the cytoplasm of responsive cells?

- A) Thyroid hormone and insulin
B) Insulin and estrogen
C) Thyroid hormone and estrogen
D) Glucagon and estrogen

23. The cooking time for food is reduced in a pressure cooker because

- A) Heat is more evenly distributed in the cooking space
B) Boiling point of the water involved in cooking is decreased
C) Boiling point of the water involved in cooking is increased
D) The higher pressure inside the cooker pulverizes the food material

24. The animals that are genetically constructed to differ at one particular locus are called as

- A) Transgenic
B) Chimeric
C) Hybrid
D) Congenic

25. Sequencing and analysis of rRNA has divided the living world into three domains called

- A) Bacteria, archaea & eukarya
B) Archaea, eukarya & virus
C) Fungi, plants and animals
D) Bacteria, archaea & plants

PART "B"

26. A process in which movement of a molecule across the membrane down its concentration gradient is coupled to the movement of a second molecule up its concentration gradient and across the membrane in opposite direction is called -

- A) Active transport
B) Symport
C) Uniport
D) Antiport

27. The matrix of mitochondria contains

- A) FADH₂
B) Citric acid cycle intermediates
C) A high concentration of glucose
D) Glycogen

28. Planarian use _____ for excretion

- A) Nephridia
B) Flame cells
C) Uriniferous tubules
D) Malpighian tubules

29. The occurrence of tetratype in the acetomycete fungi is possible only if the crossing over occurred during the

- A) G1 phase
B) S phase
C) Two-strand stage
D) Four-strand stage

30. In mammals, the diaphragm separates the

- A) Peritoneal cavity from the thoracic cavity
B) Peritoneal cavity from pericardial cavity
C) Thoracic cavity from the pericardial cavity
D) Thoracic cavity from the pelvic cavity

31. Which one of the following metabolites is not directly produced in the hexose monophosphate shunt pathway?

- A) Fructose-6-phosphate
B) Gluconolactone-6-phosphate
C) Dihydroxyacetone phosphate
D) Erythrose-4-phosphate

32. Cytochromes are found in

- A) Cristae of mitochondria
B) Matrix of mitochondria
C) Inner mitochondrial membrane
D) Outer mitochondrial membrane

33. Tapeworms attach to the digestive lining of the host by means of their

- A) Scolex
B) Stylete
C) Proglottid
D) Mastax

34. If the paternal chromosomes have alleles A, B, c and the maternal chromosomes have a, b, C - then the chromosomes that are not a product of crossing over are -

- A) A B c and a b C
 B) A b C and a B c
 C) A b c and a B C
 D) A B C and a b c

35. Nondisjunction involving the X chromosomes may occur during oogenesis and produce two kinds of eggs. If normal sperms fertilize these two types, which of the following pairs of genotypes are possible?

- A) XXY and YO
 B) XXY and XO
 C) XX and XO
 D) XX and XY

36. Methionyl-transfer RNA is used for initiation of protein synthesis by which of the following?

- A) Chloroplast
 B) Eukaryotic mitochondrial ribosomes
 C) Bacterial ribosomes
 D) Eukaryotic cytoplasmic ribosomes

37. Which component in the viral envelope attaches the human deficiency virus (HIV) to host cells?

- A) p24
 B) p18
 C) gp41
 D) gp120

38. Which one of the following could be used to distinguish between an aldose and a ketose?

- A) Fehling's reagent
 B) Tollen's reagent
 C) Feulgen's reagent
 D) Br₂ water

39. Common method used for determination of the three dimensional structure of proteins is

- A) Edman degradation
 B) X-ray crystallography
 C) MALDI TOF analysis
 D) Two dimensional gel electrophoresis

40. Which one of the following is correct?

- A) Glycogen hydrolysis is promoted by the hormone glucagon
 B) Animal cells produce cellulase which hydrolyze cellulose
 C) Carbohydrates are absorbed primarily in the form of disaccharides
 D) Insulin has little effect on carbohydrate metabolism

41. If a phosphodiester bond in one strand of double stranded circular DNA is broken, the DNA is said to be

- A) Nicked
 B) Digested
 C) Cleaved
 D) Linearized

42. The first virus to be purified was

- A) Tobacco Mosaic virus
 B) Influenza virus
 C) Polio virus
 D) Smallpox

43. The amino acid leucine has the following side chain.

- A) CH₃ - CH (OH) -
 B) CH₃ - CH - (CH)₂ -
 C) (CH₃)₂ - CH - CH₂ -
 D) CH₃ - CH₂ - CH - (CH₃) -

44. Which one of the following is NOT a part of the immune system?

- A) Pancreas
B) Thymus
C) Spleen
D) Tonsil

45. Liebermann's reaction is used for detection of

- A) aniline
B) benzoic acid
C) phenol
D) nitrobenzene

46. When an animal cell is placed in 0.5 M sucrose solution, its volume does not alter. When the same cell is transferred to a 0.5 M NaCl solution, the volume of the cell will

- A) Decrease
B) Increase
C) Remain unchanged
D) Increase and then decrease

47. Which one of the following is *mismatched*?

- A) Matrix- extracellular material in connective tissue
B) Ligaments—bind muscles to bone
C) Cardiac muscle cells-multiple nuclei
D) Adipose cells- found in loose connective tissue

48. The nucleic acid which is highly modified by extensive methylation after synthesis is

- A) hnRNA
B) tRNA
C) rRNA
D) mRNA

49. Which one of the following is an acidic amino acid?

- A) Lysine
B) Aspartic acid
C) Isoleucine
D) Proline

50. Genetic recombination in bacteria occurs through the transfer of

- A) Pili
B) Gametes
C) Plasmids
D) Endospores

51. The second messenger which plays a crucial role in regulating the synthesis and breakdown of glycogen in liver and muscle cells is

- A) IP_3
B) cAMP
C) DAG
D) cGMP

52. What blocks myosin from binding to actin, when the muscle is at rest?

- A) Acetylcholine
B) Tropomyosin
C) ATP
D) Troponin

53. Which one of the following is not a cancer drug?

- A) Daunorubicin
B) Cisplatin
C) Isoniazid
D) Methotrexate

54. Isotypes refer to variation in the

- A) Light chain variable region
B) Heavy chain constant region
C) Light chain constant region
D) Heavy chain variable region

55. When chromosome breakage occurs and the broken segment rotates by 180° degrees before reunion, the resulting chromosome aberration is known as

- A) Insertion
B) Inversion
C) Frame shift
D) Translocation

56. A common method for separating cell organelles and insoluble material from soluble proteins -

- A) Filtration
B) Differential centrifugation
C) Polyacrylamide gel electrophoresis
D) Column chromatography

57. Cystic fibrosis is caused by _____ mutation.

- A) Autosomal dominant
B) Sex linked recessive
C) Autosomal recessive
D) Sex linked dominant

58. In sensory neurons, stimuli are conducted through

- A) Axons
B) Cell body
C) Myelin sheath
D) Dendrites

59. According to molecular definition of a gene, which one of the following is not a part of eukaryotic gene?

- A) Promoter
B) Poly (A) tail
C) Enhancer
D) Polyadenylation signal

60. At room temperature formaldehyde changes into

- A) Acetic acid
B) Trioxane
C) Acetaldehyde
D) Paraldehyde

61. Which one of the following is part of the gynoecium?

- A) Carpel
B) Filament
C) Stamen
D) Sepal

62. The major class of insoluble fibrous protein present in the extracellular matrix and in connective tissue is

- A) Cadherin
B) Collagen
C) Actin
D) Fibronectin

63. The following method helps in determining the genotype of an individual for a particular trait

- A) Back cross
B) Test cross
C) Monohybrid cross
D) Dihybrid cross

64. The rhythmic beating of the heart is initiated by the

- A) Sinoatrial node
B) Purkinje fibers
C) Atrioventricular node
D) Bundle of His

65. Which one of the following is an innate immune cell type?

- A) B lymphocyte
B) T lymphocyte
C) NKT cells
D) Macrophage

66. Which one of the following is not characteristic of members of the plant kingdom?

- A) Chlorophyll a
B) Chlorophyll b
C) Chlorophyll c
D) Carotenoids

67. Releasing hormones (TRH, GnRH etc.) in higher animals are synthesized and secreted by

- A) Adenohypophysis
B) Pars-intermedia
C) Neurohypophysis
D) Hypothalamus

68. The neurotransmitter at the neuromuscular junction is-

- A) Serotonin
B) Acetyl choline
C) Dopamine
D) Epinephrine

69. Which one of the following is not a primary alcohol?

- A) Ethanol
B) Isopropyl alcohol
C) Benzyl alcohol
D) Methanol

70. Green algae, recently been investigated as food source in several nations is

- A) *Volvox*
B) *Pseudomonas*
C) *Chlamydomonas*
D) *Chlorella*

71. The virus commonly used for the management of insect pests as well as a vector for production of recombinant proteins is

- A) Baculovirus
B) Adenovirus
C) Parvovirus
D) Retrovirus

72. Two antagonistic hormones are-

- A) MSH & TSH
B) Oxytocin & Prolactin
C) Calcitonin & Parathormone
D) ADH & GH

73. Which has the maximum percentage of Cl?

- A) PVC
B) BHC
C) Neoprene
D) DDT

74. The inflammatory response includes all of the following except

- A) Phagocytic attack
B) Vessel constriction
C) Increased blood flow
D) Temperature increase

75. Worlds natural gas reservoirs are primarily produced by

- A) Archaeobacteria
B) Actinomyces
C) Primitive protists
D) Anaerobic fungi

76. Components of animal cell cytoskeleton found in cilia and flagella that direct chromosomal movement during cell division are

- A) Microfilaments
B) Microtubules
C) Intermediary filaments
D) Microtubules and microfilaments

77. Solid CO₂ is an example of

- A) Ionic crystal
B) Covalent crystal
C) Molecular crystal
D) Metallic crystal

78. The following are epimers of glucose

- A) Galactose and fructose
B) Mannose and fructose
C) Sucrose and fructose
D) Mannose and galactose

79. Enzymes from the following organelle are involved in the oxidation of fatty acids, but the released energy is not used for ATP synthesis

- A) Ribosomes
B) Lysosomes
C) Mitochondria
D) Peroxisomes

80. While most of the insects have four wings, the following have only two

- A) Housefly
B) Honeybee
C) Butterfly
D) Cockroach

81. Enzyme produced in the kidney, which catalyzes the cleavage of angiotensinogen present in the blood-

- A) Angiotensin
B) Bradykinin
C) Renin
D) Kynurenine

82. Cerebellum regulates

- A) Body temperature
B) Learning and memory
C) Sleep-wake cycle
D) Movement and balance

83. If radioactive sulphur is added to culture medium of *E. coli*, the radioactive label after 48 hours will be localized in

- A) DNA
B) RNA
C) Phospholipid
D) Enzymes

84. Vertebrate lungs are derived from

- A) Ectoderm
B) Mesoderm
C) Epiderm
D) Endoderm

85. Glucokinase

- A) Is widely distributed in most of the mammalian tissues
B) Is inhibited by glucose-6-phosphate
C) Has high Km for glucose
D) Catalyzes a reversible reaction

86. Humans can digest starch and not cellulose. Both of them contain monomeric glucose units. Starch is digested due to specificity of the intestinal enzymes for

- A) α 1- \rightarrow 4 linkage
B) β 1- \rightarrow 4 linkage
C) α 1- \rightarrow 6 linkage
D) β 1- \rightarrow 6 linkage

87. Drugs that prevent the formation of bacterial cell wall are

- A) quinolones
B) aminoglycosides
C) beta-lactams
D) Tetracycline

- 88. Heat shock proteins, originally identified as proteins expressed in response to stress, also function as -**
- A) Molecular chaperones, which assist in *de novo* protein folding
 B) GTPase activating proteins
 C) Protein kinase
 D) Proteases degrading ubiquitin-tagged proteins
- 89. When a lead storage battery is discharged**
- A) Sulphuric acid is consumed
 B) SO₂ is evolved
 C) Lead is formed
 D) Lead sulfate is consumed
- 90. The genome of an organism contains 20% adenine residue. Which one of the following statement is correct?**
- A) G + C content is 20%
 B) G + C content is 40%
 C) G + C content is 60%
 D) G + C content is 80%
- 91. If one mL of 0.01 M HCl is diluted to 100 mL at 25° C, what will be the pH of the resulting solution?**
- A) 7
 B) 5
 C) 4
 D) 2
- 92. Which one of the following pathway is very active in the tissues involved in lipogenesis and nucleic acid biosynthesis?**
- A) Glycolysis
 B) β oxidation
 C) HMP shunt pathway
 D) TCA cycle
- 93. Which one of the following is a human cell line?**
- A) Hela
 B) BHK-21
 C) CHO
 D) Sf-9
- 94. When a gasoline is given "octane number" 80, it means it contains**
- A) 80% iso-octane
 B) 80% octane
 C) 20% iso-octane
 D) 20% benzene
- 95. The bacteria which utilize CO₂ as the sole carbon source and obtain energy by oxidation and reduction of inorganic substances are called as**
- A) Chemolithotrophs
 B) Photoheterotrophs
 C) Photoautotrophs
 D) Chemoheterotrophs
- 96. Human albinism is caused by recessive gene 'a'. A child has albinism, although none of the parents are affected. What is the genotype of parents?**
- A) Aa and Aa
 B) Aa and AA
 C) Aa and aa
 D) AA and AA
- 97. Viral replication within cells is inhibited by**
- A) IFN-γ
 B) IL-1
 C) IL-4
 D) TNF-α
- 98. In the mitochondrial genome, the stop codon is**
- A) UAA
 B) AGA
 C) UUU
 D) UGA

Booklet code - C

99. Which one of the following is a polyatomic cation?

- A) Mg^{2+}
- B) OH^-
- C) NH_4^+
- D) Cu^{2+}

100. Human embryonic stem cells are commonly derived from

- A) Cord blood cells
- B) Trophoblast
- C) Complete blastocyst
- D) Inner cell mass (ICM)

For rough work

HowToExam.com

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