

Hall Ticket Number:

Booklet Code: A

Department of Animal Biology
M. Sc. Animal Biology & Biotechnology

ENTRANCE EXAMINATION June 2017

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 instructions provided there upon. Make sure that you have clearly mentioned the Booklet Code (A or B or C) on your OMR sheet.*
- *Hand over OMR answer sheet at the end of the 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 sheet (OMR) 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 a tie i.e., when more than one student gets equal marks, to prepare the merit list.*

PART "A"

1. One of the following group of animal shows viviparity

- | | |
|----------------|--------------|
| A) Annelids | B) Arachnids |
| C) Echinoderms | D) Molluscs |

2. Which of the following is caused by trinucleotide repeat expansion?

- | | |
|-------------------------|--------------------------------|
| A) Cystic fibrosis | B) Duchenne muscular dystrophy |
| C) Huntington's disease | D) Down's syndrome |

3. One of the following is a living fossil

- | | |
|----------------------------|----------------------------|
| A) <i>Dalbergia sissoo</i> | B) <i>Pinus longifolia</i> |
| C) <i>Mirabilis jalapa</i> | D) <i>Ginkgo biloba</i> |

4. Which of the following best explains the process of evolution?

- | | |
|-------------------------|-----------------------------|
| A) Natural selection | B) Horizontal gene transfer |
| C) Comparative genomics | D) Darwinism |

15. Which of the following is a planar molecule?

- A) Formaldehyde B) Acetone
C) Formic acid D) Acetic acid

16. Localization of mRNA in cells can be done using

- A) *In situ* hybridisation B) Dot blot hybridisation
C) Immunofluorescence assay D) Northern hybridisation

17. Inheritance of skin color in humans is an example of

- A) Mendelian inheritance B) Monogenic inheritance
C) *Polygenic inheritance* D) Complementary genes

18. Golden rice is a transgenic crop with an improved trait of

- A) Insect resistance B) High vitamin A content
C) High protein content D) High lysine content

19. Which of the following statements is false about enantiomers?

- A) Rotate plane polarised light B) Are superimposable mirror images
C) Are nonsuperimposable mirror images D) Have the same melting point

20. The one horned rhinoceros is specific to the following sanctuary

- A) Bandipur B) Kaziranga
C) Corbette park D) Bharatpur

21. Conjugate base of HO_2^- is

- A) O_2^- B) H_2O_2
C) O_2^{2-} D) O_2^+

22. A species is defined as endemic if they are

- A) Rare B) Localised to specific region
C) Cosmopolitan in distribution D) Are critically endangered

23. Ratio of radius of atom to that of nucleus is of the order of

- A) 10^{-10} B) 10^{-15}
C) 10^5 D) 10^{-5}

24. A disease which is not caused by fungi-

- A) Pertusis B) Dermatitis
C) Mycosis D) Candidiasis

25. Pluripotent embryonic stem cells are derived from one of the following stages during embryonic development

- A) Zygote B) Morula
C) Blastula D) Gastrula

PART "B"

26. Interferons (IFNs) are

- A) Antibacterial proteins
B) Antiviral proteins
C) Antifungal proteins
D) Bacteriostatic proteins

27. Which of the following structure is absent in Gram-positive bacteria?

- A) Cell wall
B) Outer membrane
C) Lipoteichoic acid
D) Peptidoglycan

28. The molar volume of Helium is 8.21L at

- A) 400°C, 4 atm
B) 127°C, 4 atm
C) 27°C, 0.25 atm
D) 127°C, 2 atm

29. If the molar amount of G in a DNA sample is 20%, then the molar amount of T would be

- A) 20%
B) 30%
C) 60%
D) 80%

30. The contrasting pairs of factors in Mendelian crosses are called as

- A) Alloloci
B) Multiple alleles
C) Allelomorphs
D) Paramorphs

31. A color blind female is often rare because she will be born only when

- A) Her mother and maternal grandfather are color blind
B) Her father and maternal grandfather are color blind
C) Her father has normal vision and mother is color blind
D) Her parents have normal vision but grand parents are color blind

32. Hematopoietic stem cells are considered as

- A) Totipotent
B) Multipotent
C) Pluripotent
D) Precursor

33. Which has maximum equilibrium molarity of sodium ion in 0.1M aqueous solution (assume 100% ionisation)?

- A) Sodium oxalate
B) Sodium orthophosphate
C) Sodium metaphosphate
D) Sodium bicarbonate

34. The light yellowish color of cow's milk is due to presence of

- A) Carotene
B) Curcumin
C) Riboflavin
D) Bilirubin

35. Deep sea fishes are

- A) Ectothermic homeotherms B) Endothermic homeotherms
C) Ectothermic and heterotherms D) Endothermic heterotherms

36. A genetically engineered microorganism widely used in bioremediation of oil spills is

- A) *Trichoderma* B) *Bacillus*
C) *Pseudomonas* D) *Xanthomonas*

37. Myriapods consists of

- A) Centipedes and millipedes B) Crayfishes and crabs
C) Shrimps and lobsters D) Spiders and scorpions

38. Alkenes are most soluble in one of the following solvents

- A) Water B) Ethyl alcohol
C) Ammonia D) Carbon tetrachloride

39. A relationship between two species in which the individuals of one species adversely affects the other while itself remaining unaffected is known as

- A) Commensalism B) Amensalism
C) Mutualism D) Parasitism

40. Which of the following is not required for PCR?

- A) DNA polymerase B) Dideoxy-dNTPs (ddNTPs)
C) Primers D) Template DNA

41. The percentage of human loci that are heterozygous

- A) 2% B) 5%
C) 37% D) 55%

42. One of the following is the Brewer's yeast

- A) *Saccharomyces ludwigi* B) *Saccharomyces cerevisiae*
C) *Saccharomyces boulardii* D) *Saccharomyces pastorianus*

43. Fats and oils are

- A) Monoesters of glycerol B) Diesters of glycerol
C) Triesters of glycerol D) Diesters of glycol

44. In one of the following orders of insects, the hind pair of wing is modified into halteres

- A) Lepidoptera B) Orthoptera
C) Hemiptera D) Diptera

45. All individuals of a species inhabiting a given area is called as
A) Biome
B) Population
C) Ecosystem
D) Community
46. Which is not amphoteric?
A) HSO_4^-
B) H_2PO_2^-
C) H_2O
D) NH_3
47. Fine organic or inorganic particles suspended in air is known as
A) Aerosol
B) Gaseous pollutant
C) Particulate pollutant
D) Smog
48. Ozonolysis of 2-butyne gives
A) Formic acid
B) Propionic acid
C) Acetic acid
D) Butanoic acid
49. Amphioxus belongs to the group of
A) Urochordates
B) Amphibia
C) Cephalochordates
D) Reptilia
50. Which of the following can be used to stain lipid inclusions in bacteria?
A) Sudan black
B) Methylene blue
C) Trypan blue
D) Toluidine blue
51. Cleavage asynchrony is often seen during development of fertilized eggs of
A) Mice
B) Sea urchin
C) Snake
D) Frog
52. The outer most covering of the brain is
A) Choroid
B) Arachnoid
C) Pia mater
D) Dura mater
53. Hardness in a given water sample is 300ppm CaCO_3 . What would be its molarity?
A) 0.300M
B) 0.030M
C) 0.003M
D) 0.0015M
54. When a single gene influences more than one trait, it is called as
A) Epistasis
B) Pleiotropy
C) Pseudodominance
D) Co-dominance
55. Largest number of *Eucalyptus* plant species are found in
A) Australia
B) India
C) Burma
D) Newzealand

- 56. The cell organelle involved in the initiation of the intrinsic pathway of apoptosis is**
A) Endoplasmic reticulum B) Lysosomes
C) Mitochondria D) Peroxisomes
- 57. The bond angle associated with the hybrid orbitals of a carbon involved in a triple bond is**
A) 180° B) 120°
C) 109° D) 45°
- 58. One of the following is the major pathway of ammonia detoxification**
A) 2-Oxoglutarate to glutamate to glutamine B) 2-Oxoglutarate to aspartate to alanine
C) Oxaloacetate to aspartate to alanine D) Pyruvate to alanine to lactic acid
- 59. Hybridoma technology was developed by**
A) Kohler and Milstein B) Landsteiner
C) Armauer Hansen D) Emil von Behring
- 60. CD8⁺ T cells differentiate into, that are capable of recognizing and killing infected cells**
A) T helper cells B) Cytotoxic cells
C) Dendritic cells D) Natural Killer cells
- 61. One of the following drugs is effective against *Mycobacterium tuberculosis***
A) Amoxicillin B) Methycillin
C) Isoniazid D) Erythromycin
- 62. 2,2-Dichloropropane reacts with aqueous KOH to give**
A) 2,2-Propanediol B) Propanol
C) Acetone D) n-Propyl alcohol
- 63. Who established DNA and not protein as the genetic material?**
A) Hershley and Chase B) Messelson and Stahl
C) Kohler and Milstein D) Barbara McClintock
- 64. The deficiency of one of the following enzymes causes Albinism**
A) Catalase B) Fructokinase
C) Xanthine oxidase D) Tyrosinase
- 65. Viable material of endangered plant species can be preserved through**
A) Gene bank B) Gene library
C) Gene pool D) Herbarium

75. Ketones react with Grignard reagents to form an addition product which on hydrolysis gives a

- A) Primary alcohol
B) Tertiary alcohol
C) Secondary alcohol
D) Ketal

76. Gene targeting is primarily done on

- A) A sperm cell
B) An egg cell
C) A fertilised ovum
D) Early embryonic cells

77. The type of bond existing in trehalose, a disaccharide present in fungi and insects is

- A) $\alpha(1\rightarrow1)$
B) $\beta(1\rightarrow4)$
C) $\alpha(1\rightarrow4)$
D) $\alpha(1\rightarrow2)$

78. Which has maximum entropy of vapourisation?

- A) Ethanol (liquid)
B) Benzene (liquid)
C) Toulene (liquid)
D) CO_2 (gas)

79. Erythroblastosis fetalis is caused due to

- A) Sex chromosome incompatibility
B) Rh and ABO incompatibility
C) Epigenetic modifications
D) Hemophilia

80. In the Krebs cycle, citrate loses two of its six carbons as CO_2 during its conversion to oxaloacetate. From the citrate structure, which two carbons are lost to give rise to CO_2 ?

- A) C_1 and C_2
B) C_1 and C_4
C) C_1 and C_6
D) C_4 and C_6

81. One of the following is not a cytoplasmic organelle of the cell

- A) Endoplasmic reticulum
B) Mitochondria
C) Peroxisomes
D) Nucleolus

82. Which of the following compounds will give an idoform test?

- A) Benzoic acid
B) Ethanol
C) Benzyl chloride
D) Methanol

83. The parasite which has only one host-

- A) *Taenia solium*
B) *Plasmodium vivax*
C) *Leishmania donovani*
D) *Entamoeba histolytica*

84. Acid rains are caused by

- A) Ozone
B) Oxides of nitrogen
C) Oxides of sulphur
D) Oxides of carbon

85. The process of phagocytosis was discovered by

- A) Robert Koch
B) Ilya Mechnikov
C) Louis Pasteur
D) Edward Jenner

86. Binomial nomenclature was proposed by

- A) Carlo Allioni
B) Carl Linnaeus
C) Alexander Hamilton
D) Robert Almer Harper

87. Which of the following compounds will be easily oxidized?

- A) Primary alcohol
B) Secondary alcohol
C) Tertiary alcohol
D) Aldehyde

88. The gland with both exocrine and endocrine functions is

- A) Thyroid
B) Pancreas
C) Mammary gland
D) Pituitary

89. After intense exercise, the lactate produced in skeletal muscles is transported to liver where it is converted into glucose. These reactions constitute

- A) Gluconeogenesis
B) HMP shunt
C) Kelvin cycle
D) Cori cycle

90. The rate of chemical reaction generally increases rapidly even for small temperature increase because of rapid increase in

- A) Collision frequency
B) Fraction of molecules with energy in excess of the activation energy
C) Activation energy
D) Average kinetic energy of the molecule

91. Well defined acrosome is not found in the spermatozoa of

- A) Frog
B) Fish
C) Snake
D) Birds

92. Number of $(OH)^-$ ions in 1 ml solution of $pH=13$ is

- A) 1×10^{-13}
B) 6×10^7
C) 6×10^{13}
D) 6.02×10^{19}

93. Pytalin is secreted by

- A) Pancreas
B) Stomach
C) Liver
D) Salivary glands

94. Chronic exposure to arsenic causes

- A) Skeletal fluorosis
B) Black foot disease
C) Blue baby syndrome
D) Night blindness

95. Cyclic ethers with three membered rings are called

- A) Lactones
B) Oxiranes
C) Alkoxides
D) Epoxy resins

96. The major pollutant from automobile exhaust is

- A) NO
B) CO
C) SO₂
D) Soot

97. Higher rate of photosynthesis occurs in

- A) Red light
B) Blue light
C) White light
D) Yellow light

98. Select the incorrect statement

- A) There is no change in the concentration of the reactants and products at equilibrium
B) Equilibrium is always dynamic
C) Equilibrium can be approached from either of the sides
D) Catalyst can alter the state of equilibrium

99. Pepsin is an example of

- A) Hormone
B) Enzyme
C) Vitamin
D) Mineral

100. The process by which oxygen passes from lung alveoli into blood capillaries is

- A) Diffusion
B) Osmosis
C) Active transport
D) Passive transport

For rough work