

NATIONAL UNIVERSITY OF SCIENCE & TECHNOLOGY (NUST)

Applied Biosciences Sample Admission Test 02

BIOLOGY:

Directions: For each question below you are given four choices. SELECT ANY ONE THAT IS MOST APPROPRIATE ANSWER ALL ANSWER MUST BE GIVEN ON THE ANSWER SHEET.

YOUR ANSWERS MUST BE INDICATED BY LETTERS (A, B, C, D) AND NOT BY THE WORDS THEMSELVES.

- The phase involved in repair process of a simple fracture is

A) Hematoma formation	B) Callus formation
C) Remodeling	D) All these
- A disease that begins gradually with stiffness of jaws and neck muscles and progresses to fixed rigidity of jaws and spasms of trunk and limb muscles and is usually fatal due to respiratory failure is

A) Tetany	B) Tetanus
C) Cramps	D) Muscle fatigue
- The most important step for the establishment of spermatophytes on land is

A) Evolution of flower and inflorescence	B) Transfer of gametes by pollen tubes
C) Evolution of pollen tube	D) Food storage for developing embryos
- Which of the following animals reproduces by parthenogenesis?

A) Ants	B) Bees
C) Wasps	D) All these
- Human menstrual cycle generally repeats every

A) 7 days	B) 3-7 days
C) 25 days	D) 28 days
- The root cambium is called

A) Cambium	B) Bark
C) Pericycle	D) Root apical meristem
- One of the prominent structural features in chick embryo of about 18 hour is

A) Hensen's node	B) Primitive groove
C) Primitive node	D) Notochord
- Negative physiological changes in our body are referred to as

A) Regeneration	B) Aging
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- C) Embryonic induction
- D) Differentiation
9. The sequence of nucleotides that determines the amino acid sequence of a protein is called is
- A) Genetic code
- B) Genome
- C) Gene
- D) Translation
10. A tRNA molecule possessing complementary three- nucleotide sequence is called
- A) A codon
- B) An anticodon
- C) Genetic code
- D) Sense codon
11. The period of cell cycle between two consecutive divisions is termed
- A) Interphase
- B) G₀ - phase
- C) G₁- phase
- D) S – phase
12. Most critical phase of the mitosis that ensures equal distribution of chromatids in daughter cells is
- A) Prophase
- B) Metaphase
- C) Anaphase
- D) Telophase
13. The cell swells and bursts releasing intracellular contents during
- A) Necrosis
- B) Apoptosis
- C) Cancer
- D) Both a and b
14. A physiological effect of an allele over its partner allele at the same gene locus is usually referred to as
- A) Dominance
- B) Incomplete dominance
- C) Codominance
- D) Over dominance
15. Which of the following blood type is clear of any anti- Rh antibody?
- A) Rh – positive
- B) Rh – negative
- C) Both a and b
- D) None of these
16. Genes that affect growth rate in humans also influence both weight and height Such a gene with multiple phenotypic effect is called
- A) Epistatic
- B) Apoptotic
- C) Pleiotropic
- D) Continuously varying
17. SRY gene is an example of
- A) X – linked gene
- B) Y – linked gene
- C) Sex – linked trait
- D) X – and Y linked genes
18. A means by which recombinant DNA is introduced into a host cell is

- A) Plasmid
C) Prion
- 19 Which of the following is a powerful tool of forensic science?
A) DNA Test
C) Gene sequencing
- 20 Coconut milk contains which of the followings.
A) Auxins
C) Cytokinin
- 21 The smallest biological unit that can evolve over time is
A) An organism
C) A population
- 22 The frequencies of genotypes of non- evolving populations can be described by
A) Mendel's law of independent assortment
C) Neo – Darwinism
- 23 The populations can be described in terms of
A) Members
C) Age distribution
- 24 One of the followings are responsible for releasing chemical elements as ions into the environment
A) Producers
C) Decomposers
- 25 An association between an host and a parasite that provides food. Protection and conditions for survival to a parasite is
A) Symbiosis
C) Mutualism
- 26 Which of the following is principal stages in nitrogen cycle?
A) Ammonification
C) Assimilation
- 27 Where fungi can be found in a lake?
A) Littoral zone
C) Profundal zone
- B) Vector
D) Virion
- B) DNA fingerprints
D) Polymerase chain reaction
- B) Gibberellin
D) Ethylene
- B) A species
D) An ecosystem
- B) Hard Weinberg's theorem
D) Theory of Nutrual Selection
- B) Growth rate
D) All these
- B) Consumers
D) Heterotrophs
- B) Parasitism
D) Commensalisms
- B) Nitrification
D) All these
- B) Limnetic zone
D) All these

- 28 Which of the following ecosystems occurs in regions where mean annual rainfall is midway between forest and a desert?
- A) Tundra
B) Taiga
C) Grassland
D) Boreal
- 29 An example of a human population's exceeding the carrying capacity of the land that resulted in loss of productivity of the ecosystem is
- A) Sahel
B) Sahara
C) Thar
D) Thal
- 30 Which of the followings is termed environmental buffer?
- A) Trees
B) Forests
C) Deserts
D) Grasslands
- 31 A structure within a cell that performs a specific function is a (an)
- A) Macromolecule
B) Organ
C) Organelle
D) Organ system
- 32 Very similar potentially interbreeding organisms are
- A) Organisms
B) Species
C) Population
D) Community
- 33 Which of the following is main source of energy in cells?
- A) Carbohydrates
B) Proteins
C) Lipids
D) Nucleic acids
- 34 An activated enzyme consisting of polypeptide chain and a cofactor is known as
- A) Apoenzyme
B) Holoenzyme
C) Coenzyme
D) Activator
- 35 One of the followings are most abundant in plant seedlings
- A) Lysosomes
B) Glyoxysomes
C) Peroxisomes
D) Secondary Lysosomes
- 36 During cell division the chromatin material is converted into darkly stained thread like structures known as
- A) Chromosomes
B) Chromatids
C) Centromere
D) Centrosomes
- 37 Accumulation of lipids in brain cells lead to

- A) Mental retardation
 B) Hepatitis
 C) Glycogenesis type II
 D) AIDS
- 38 Hepatitis is caused by
 A) Prion
 B) Virus
 C) Paramycovirus
 D) Reterovirus
- 39 The plasma membrane an everything present within it is known as
 A) Cytoplasm
 B) Protoplasm
 C) Protoplast
 D) Karyoplasms
- 40 The phase during bacterial growth in which bacteria prepare themselves for division is
 A) Lag phase
 B) Log phase
 C) Stationary phase
 D) Decline phase

CHEMISTRY

Directions: For each question below you are given four choices. SELECT ANY ONE THAT IS MOST APPROPRIATE ANSWER

ALL ANSWER MUST BE GIVEN ON THE ANSWER SHEET.

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41. The natural source of CO is
 A) Bacterial action
 B) Volcanoes
 C) Automobiles
 D) Oxidation of CH₄ in the atmosphere
42. The major source of CO in the atmosphere is
 A) Combustion of fossil fuel
 B) Motor vehicles (fuel burning)
 C) Both a & b
 D) None
43. Which of the following statement about the organic chemical is wrong
 A) At high conc. they cause nausea, & blindness
 B) At low conc. These compounds become tasteful
 C) They also related with carcinogenic
 D) It also effects the central nervous system
44. The process of coagulation can remove the suspended solids in the raw water more than

- A) 70% B) 80%
- C) 90% D) None of above
45. Ground water becomes hard when it contains the
- A) Calcium B) Sodium
- C) Sulphur D) None
46. Organic compounds resemble to those of inorganic compounds having same
- A) Ionic properties B) Carbon forming long chain or rings
- C) Chemical forces D) Isomerism
47. Rates of organic reactions are
- A) Fast B) Very fast
- C) Slow D) Non-reactive
48. Hybridization explain the----of orbitals
- A) Shapes B) Type of Bonding
- C) Both a & b D) None of above
49. The rotation of two carbon atoms joined by double bond would happened only if
- A) Pi bond is broken B) Sigma bond is broken
- C) Both bonds are broken D) None of above
50. Isomerism is only possible when the compound contains more than
- A) Two carbon atoms B) Three carbon atoms
- C) Four carbon atoms D) Five carbon atoms
51. Write the name of following compound $CH_3 - \overset{\overset{CH_3}{|}}{HC} - CH_2 - HC = CH - CH_3$
- A) 5 – methyle – 2 – hexene B) 2- methylehexene
- C) 4 – ethyle – 2 – methylehexene D) 3 – ethyle – 3 – methyl hexene
52. Kolb's method has limited synthetic applications due to
- A) Expensive catalysis B) Slow reaction
- C) Number of side products produced D) Salts used are very expensive

53. The unreactivity of alkanes is based upon
A) Inertness of sigma-bond
B) Non-polarity of the bonds
C) Both a & b
D) None of above
54. Complete combustion of alkane yields
A) $\text{CO}_2 + \text{H}_2\text{O}$
B) $\text{CO}_2 + \text{heat}$
C) $\text{CO} + \text{H}_2\text{O} + \text{heat}$
D) $\text{CO}_2 + \text{H}_2\text{O} + \text{heat}$
55. The major reaction occurring in the engines of automobiles is
A) Oxidation
B) Reduction
C) Combustion
D) Decomposition
56. Incomplete oxidation of alkanes yields
A) CO_2 & carbon black
B) $\text{CO}_2 + \text{heat}$
C) CO & carbon black
D) $\text{CO} + \text{heat}$
57. Raney – nickel is the alloy of Ni with
A) Pt
B) Al
C) Cu
D) Pd
58. Mustard gas is a
A) Gas
B) High boiling liquid
C) High melting liquid
D) Steam
59. During the preparation of alkynes the active metals that react with tetra halo-alkanes are
A) Zn
B) Mg
C) Both a and b
D) None
60. The method involved for electrolysis of Na or K salts of carboxylic acids
A) Sabatier's sendrens reaction
B) Kolbe's method
C) Clemmensen
D) Wolf kishner reduction
61. How many molecules of chlorine adds in benzene in the presence of sunlight
A) One
B) Two
C) Three
D) Four

62. The stability of aromatic compounds decreases with ---- in the no. of its resonance structure
A) Decrease
B) Increase
C) Remain constant
D) Partially decreases
63. Which reaction is too vigorous to control
A) Chlorination
B) Bromination
C) Iodination
D) Fluorination
64. How many isomeric disubstituted products are obtained by the introduction of second group in the ring
A) Two
B) Three
C) Four
D) None
65. The electron releasing effect of methyl group is significant and it makes ring a good
A) Electrophilic
B) Nucleophilic
C) Nucleophobic
D) Hydrophobic
66. Which one of the following is (m - xylene)
A) 1,2 dimethyl benzene
B) 1,3 dimethyl benzene
C) 1,5 dimethyl benzene
D) 1,4 dimethyl benzene
67. All are ortho&Para directing except
A) X
B) OH
C) NR₃
D) NH₂
68. Which one does not decolourized KMnO₄
A) Alkenes
B) Alkynes
C) Benzene
D) All above
69. During nitration of benzene, the active nitrating agent is
A) NO₂⁺
B) NO⁺
C) NO⁻
D) HNO₃
70. Meta directing group decreased the.....of benzene ring
A) Physical activity
B) Chemical reactivity
C) Density
D) None

PHYSICS:

Directions: For each question below you are given four choices. SELECT ANY ONE THAT IS MOST APPROPRIATE ANSWER ALL ANSWER MUST BE GIVEN ON THE ANSWER SHEET.

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71. Which one of the following cannot measure wavelength of X-rays in any way
A) Bragg's law B) Diffraction grating C) Compton effect D) Photo electric effect
72. Which one of the following properties is not found in both sound and light
A) Interference B) Diffraction C) Polarization D) Reflection
73. The relation between time period T and angular velocity ω is given by
(a) $T = 2\pi\omega$ (b) $T = \omega/2\pi$ (c) $T = 2\pi/\omega$ (d) $T = v\omega$
74. When a body moves in a circle, the angle between its linear velocity v and angular velocity ω is
(a) 0° (b) 45° (c) 90° (d) 180°
75. π radians =
(a) 90° (b) 180° (c) 60° (d) 30°
76. In racing car moving along a circular path the friction at the wheels and banking of roads provides the
(a) Centripetal Force (b) Centripetal Acceleration (c) Centre of Mass (d) Centrifugal Force
77. The time period is defined as the time required to traverse by a revolving body.
(a) One radian (b) 180 degrees (c) One revolution (d) 90 degrees
78. Which of the following particles can induce artificial radio-activity in certain nuclei?
(a) α -particle (b) β -particle (c) γ -particle (d) All of the above
79. Identify the alpha-particle?
(a) ${}_1\text{H}^1$ (b) ${}_1\text{H}^2$ (c) ${}_1\text{H}^3$ (d) ${}_2\text{He}^4$

80. Which of the following particles move with velocity of light?
(a) α -particle (b) β -particle (c) γ -particle (d) All of the above
81. The torque on a body will be zero if the angle between \vec{r} and F is zero or:
a. 90° b. 180° c. 270° d. None
82. What is kinetic energy of a body of mass 10 kg moving with velocity 1m/s^2 ?
a. 10 Joules b. 20 Joules c. 5 Joules d. 2.5 Joules
83. Which of the following lists of physical quantities consists only of vectors:
a. Time, temperature, velocity b. Force, volume, momentum
c. Velocity, acceleration, mass d. Force, acceleration, velocity
84. If two forces each of magnitude 5N act along the same line on a body, then the magnitude of their resultant will be
a. 5N b. 10N c. 20N d. 30N
85. Applied force F on a body of mass m , moving with acceleration a is
a. m/a b. a/m c. ma d. $m : a$

ENGLISH

Directions: For each question below you are given choices. SELECT ANY ONE THAT IS MOST APPROPRIATE ANSWER

SENTENCE COMPLETION

Directions : Each sentence below has one or two blanks, each blank indicating that something has been omitted. Beneath in sentence are five lettered words or sets of words. Choose the word or set of words that best fits the meaning of the sentence as a whole.

86. We need both ornament and implement in our society; we need the artist and the_____.

- A. beautician B. Writer
C. politician D. Artisan
E. Model

87. When such _____ remarks are circulated, we can only blame and despise those who produce

them.

- A. adulatory
- B. Chance
- C. reprehensible
- D. redundant

88. The stereotypical image of masculinity assumes that weeping is _____ "unmanly" behaviour, and not simply a human reaction which may be _____ by either sex.

- A. Inexplicably. repented
- B. Excessively...discerned
- C. Essentially...defined
- D. Inherently...adopted

ANALOGY

Direction: Each question below consists of a related pairs of words or phrases, followed by five lettered pairs of words or phrases, Select the lettered pair that best expresses a relationship similar to that expressed in the original pair.

89.FRAGILE : BREAK ::

- (a) vital : destroy
- (b) hostile : invite
- (c) vivid : grow
- (d) flexible : bend
- (e) fertile : smell

90.SPOKE : WHEEL ::

- (a) square : circle
- (b) balance : lever
- (c) door : latch
- (d) book : shelf
- (e) rung : ladder

91.VESSEL : FLEET ::

- (a) wolf : pack
- (b) forest : clearing
- (c) vehicle : truck
- (d) carriage : horse
- (e) squadron : rank

92.PICADOR : BULL ::

- (a) heckler : speaker
- (b) executioner : victim
- (c) shepherd : sheep
- (d) singer : song
- (e) matador : cow

93.CORPULENCE : STOUT ::

- (a) baldness : hirsute

- (b) erudition : learned
- (c) gauntness : beautiful
- (d) steadfastness : mercurial

ANTONYM

Direction: In each of the following antonym questions, a word printed in capital letters precedes five lettered words or phrases. From these five lettered words or phrases, pick the one most nearly opposite in meaning to the capitalized word.

94. OMNIPOTENT:
 (A) Weak (B) Strong (C) Sour (D) Safe
95. OBLIGATORY:
 (A) Friendly (B) Optional (C) Facile (D) Divorced
96. OBSOLETE:
 (A) Desolate (B) Frightful (C) Heated (D) Renovated
97. OPTIMUM:
 (A) Minimum (B) Chosen (C) Worst (D) Knowledgeable

READING COMPREHENSION

Direction: Please read the passage below and answer the questions on the basis of what is stated or implied.

Passage:

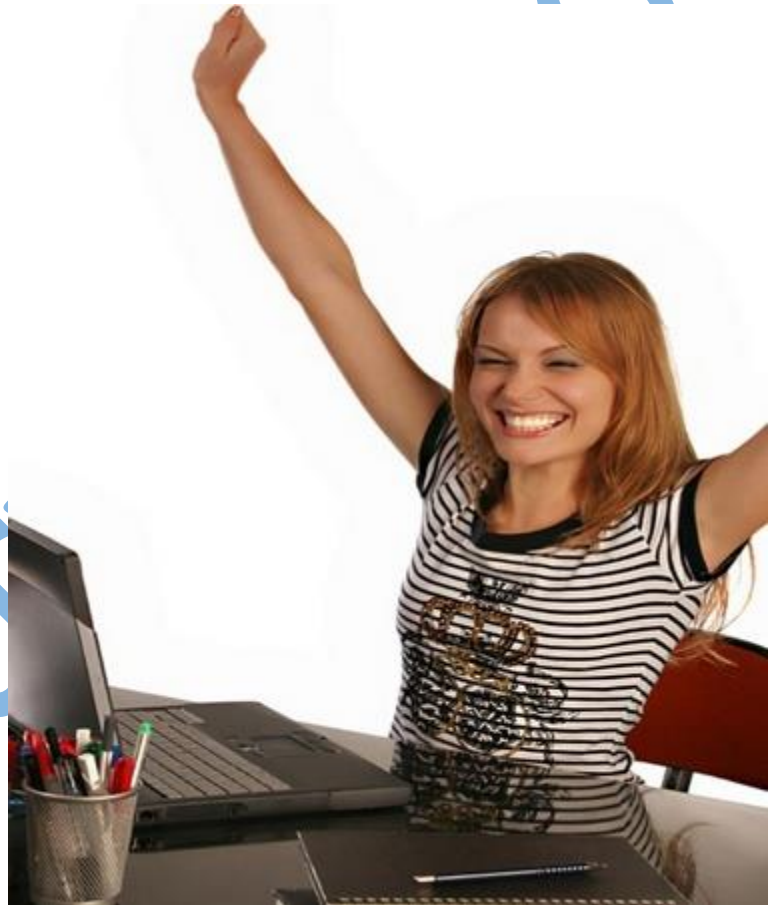
The Nile is the largest river of the world. Although it forms many falls and cataracts, it is navigable for quite a long distance. Floods in the Nile are caused by heavy summer rains in Ethiopia. The water overflows the banks and spreads over a large area. When it recedes, it leaves behind a thick layer of mud which makes the land rich and fertile.

QUESTIONS

98.	The river Nile is navigable for a long distance because			
	A)	It forms cataracts and falls	B)	The cataracts and falls facilitate sailing
	C)	There is little obstruction	D)	The river is very wide
99.	The fertility of the land is caused by			
	A)	Summer rain in Ethiopia	B)	Floods in the river
	C)	Water spreading over a large area	D)	Slime left by the river
100.	"Cataract" means			
	A)	Whirlpool	B)	Tidal flurry
	C)	Water fall	D)	Under current

END OF TEST

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