|  |
| --- |
| IIU%20Logo%20Green**INTERNATIONAL ISLAMIC UNIVERSITY ISLAMABAD**  **Faculty of Basic & Applied Sciences**  *Department of Bioinformatics & Biotechnology* |
| Admission Test Fall 2010 BS Biotechnology |
|  |
|  |
|  |
| **7/21/2009** |

**SECTION-I**

**BIOLOGY**

1. What name is given to the clear layer at the front of the eye?
   1. Retina c. Cornea
   2. Lens d. Iris
2. All proteins contain carbon, hydrogen, oxygen and ­­\_\_\_\_\_
   1. Nitrogen c. Chlorine
   2. Sulphur d. Phosphorous
3. Which of these hold bones together?
4. Ligament c. Cartilage
5. Tendons d. Synovial fluid
6. What is the collective name for the male parts of a flower?
   1. Carpals c. Stamens
   2. Anther d. Filament
7. DNA can be damaged by many sorts of?
   1. Mutagens c. Alpha rays
   2. X – Rays d. Carcinogens
8. The complete set of an organism’s genetic material is known as
   1. Proteome c. Gene
   2. Genome d. Phenome
9. Which two elements are necessary for something to be “organic”
   1. Nitrogen and calcium c. Carbon and oxygen
   2. Phosphorus and potassium d. Oxygen and hydrogen
10. All the genes in a population is
    1. Gene record c. Genetic frequency
    2. Gene pool d. Genetic drift
11. Are viruses prokaryotic or eukaryotic?
    1. Both c. Eukaryotic
    2. Prokaryotic d. Neither
12. A protein will have no overall charge at
    1. Isoelectric point c. pH 7
    2. pH above 10 d. not possible
13. A field of applied [biology](http://en.wikipedia.org/wiki/Biology) that involves the use of living things in [engineering](http://en.wikipedia.org/wiki/Engineering), [technology](http://en.wikipedia.org/wiki/Technology), [medicine](http://en.wikipedia.org/wiki/Medicine), and other useful applications is known as
    1. Biotechnology c. Tissue culture
    2. Biochemistry d. None of above
14. The test which involves the direct examination of the [DNA](http://en.wikipedia.org/wiki/DNA) molecule itself. A scientist scans a patient’s DNA sample for mutated sequences.
    1. DNA fingerprinting c. None of above
    2. [Genetic testing](http://en.wikipedia.org/wiki/Genetic_testing)
15. Genetics is the study of the effect of genetic differences on organisms. Often this can be inferred by the absence of a normal component which may be
    1. Gene c. protein
    2. trait
16. [Some viruses](http://en.wikipedia.org/wiki/RNA_virus) (e.g., [retroviruses](http://en.wikipedia.org/wiki/Retrovirus)) have DNA as their genetic material.
    1. True b. False
17. The DNA double helix is stabilized by
18. Transcription factors c. Hydrogen bonding
19. Nucleotide
20. The ancient type of biotechnology is known as
21. Genetic engineering c. None of above
22. Breeding
23. The [polymerase chain reaction](http://en.wikipedia.org/wiki/Polymerase_chain_reaction) is an extremely versatile technique for copying
24. DNA c. Both of above
25. RNA
26. Molecular biologyis the study of molecular underpinnings of the process of
27. [replication](http://en.wikipedia.org/wiki/DNA_replication) c. Study of Living things at Molecular Level
28. [transcription](http://en.wikipedia.org/wiki/Transcription_%28genetics%29) and [translation](http://en.wikipedia.org/wiki/Translation_%28biology%29) d. all of above
29. Interaction of DNA with [histones](http://en.wikipedia.org/wiki/Histone) involves the proteins' basic amino acids bind to the nucleotides on DNA.
    1. True b. False
30. pH range is in between‐‐‐‐‐
    1. 1‐14 c. 1‐7
    2. 0‐7 d. 0‐14
31. Buffers has the ability to
    1. Change in pH c. no resist to change in pH
    2. resist change in pH d. all of the above
32. To maintain the bacterial population in a‐‐‐‐‐‐‐‐‐ growth phase is referred as continuous culture.
    1. Lag phase c. stationary phase
    2. Log phase d. death phase
33. Slide culture technique is used for‐‐‐‐‐‐‐‐
    1. Bacterial isolation c. virus cultivation
    2. fungi cultivation d. all of the above
34. The process of killing or removal of organisms capable of causing infection is called as\_\_\_\_\_\_\_
    1. sterilization c. sanitization
    2. antisepsis
35. In naming of bacteria, the first name refers to ‐‐‐‐‐‐‐‐‐
    1. Species c. genus
    2. strain d. none of the above
36. Which of the following molecules functions to transfer information from the nucleus to the cytoplasm?

a. DNA c. tRNA

b. mRNA d. tRNA

e. Lipids

1. The following are a category of genetic mutations EXCEPT
   1. Insertion c. Deletion
   2. Frame shift d. Point mutation
2. Translation
3. The TATA box is located in the

a. Splice enhancer c. Promoter

b. Intron-exon border d. Poly-A addition site

29. A culture containing only one kind of microorganism is called‐‐‐‐‐‐

* 1. Culture c. Auxenic culture
  2. pure culture d. all of the above

1. Molecular taxonomy determined by DNA base composition based on ‐‐‐‐‐‐
   1. % of G+C c. % of A+T+G+C
   2. % of A+T d. all of the above
2. Staining and Visualizing the organism’s Chromosome under Microscope is known as
   1. Genotyping c. Fingerprinting
   2. Karyotyping
3. Which of the following are hydrophobic?
   1. vinegar c. skin
   2. Sugar d. wax
4. The unused -COOH at the other end of protein is known as
   1. O terminus c. C terminus
   2. H terminus d. End terminus
5. Standard Genetic Code is
   1. Couple Base c. Quartet Base
   2. Triple Base d. None of Above
6. Alternative forms of genes or other sequences is known as
   1. Unimorphism c. Polymorphism
   2. Heteromorphisim d. homomorphism
7. A human male carrying an allele for a trait on x chromosome is
   1. Homozygous c. Homozygous
   2. Heterozygous d. Hemizygous
8. Holozygous
9. Which of the following types of mutation is most likely to lead to premature termination of translation
   1. Insertion of single base c. Deletion of 3 bases
   2. Deletion of Single base d. Deletion of entire gene
10. Deletion of Single base in Promoter region
11. The first transposon was discovered in
    1. Rice c. Barley
    2. Wheat d. Maize
12. Which of the following is a test cross
    1. Tt X Tt c. Tt X tt
    2. Tt X TT d. TT X tt
13. An experiment is held to determine the affect of various inorganic ions on plant growth. Plants are placed into different liquids (solutions). Each liquid contained an almost balanced mixture of elements, but each solution lacked one specific element, these being nitrogen, phosphorus, potassium and magnesium. What should be added to each solution to make the experiment successful?
    1. Fertilizer c. Mineral Water
    2. Trace elements d. Growth Hormones
14. The Calvin cycle describes the steps in the fixation of carbon dioxide during photosynthesis. According to this cycle how many molecules of ATP need to be dephosphorylated to make a single molecule of glucose?
    1. 3 c. 9
    2. 6 d. 12
    3. 18
15. During the winter newly developing leaves growing above the meristem become converted into stiff bud scales that wrap the meristem closely and will protect it from mechanical damage and drying out during the winter. The plant hormone mainly responsible for this action is :

a. Cytokinin c. Gibberellin  
b. Systemin d. Ethylene   
e. Abscisic Acid

1. Which of the following processes requires the involvement of intermediary protein-DNA complexes such as RecA ?
   1. Fermentation c. Genetic drift
   2. Genetic recombination d. Non-random mating
2. Natural selection
3. In the plant world there are various types of pigments which absorb energy from light. Which of the following pigments produces the green color of leaves?
   1. Chlorophylls c. Phycobilins
   2. Carotenoids d. Thylakoids
4. None of the above
5. In the lac operon model, lactose reacts with the lac repressor allowing the RNA polymerase to attach to the operon. In this situation, lactose is known as the
   1. Operator c. Regulator
   2. Inducer d. Repressor
6. Co repressor
7. What is the function of Restriction Enzymes
   1. Add new nucleotides to growing strand of DNA
   2. Join nucleotide during replication
   3. Cut nucleic acids at specific site
   4. Join nucleotides during replication
   5. Repairs breaks in sugar-phosphate backbones
8. The ultimate source of energy on earth is
   1. Solar energy c. Water
   2. Petroleum d. oil
9. Which of them is a polysaccharide
   1. Glucose c. Fructose
   2. Starch d. Maltose
10. The total no. of Amino Acids are
    1. 5 c. 20
    2. 50 d. 15
11. The gradual and continuous process of modification of Ancestral forms is known as
    1. Mutation c. Fragmentation
    2. Regeneration d. Evolution

**SECTION-II**

**MATHEMATICS**

1. In a certain class, if there are 35 men and 63 women, then the ratio of men to women is
2. 7/20
3. 3/7
4. 5/9
5. 7/9
6. 6x2 – 15x – 21 =
7. 3(2x +7)(x – 1)
8. 3(2x – 7)(x + 1)
9. 3(2x – 1)(x + 7)
10. -9x2 – 21
11. If n is the average (arithmetic mean) of the three numbers 6, 9, and k, what is the value of k in terms of n?
    1. 3n – 15
    2. n – 5
    3. n – 15
    4. n – 15/3
12. Which of the following CANNOT be expressed as the sum of squares of two integers?
13. 13
14. 17
15. 21
16. 29
17. Mary has 3 dollars more than Bill has, but 5 dollars less than Jane has. If Mary has x dollars, how many dollars do Jane and Bill have altogether?
18. 2x – 8
19. 2x – 5
20. 2x -2
21. 2x + 2
22. If x = 3 and y = -3, what is the value of (3 + x)(3 + y)?
23. 36
24. -12
25. 0
26. 12
27. If the area of a circle is 25π, then the diameter of the circle is
28. 5
29. 10
30. 20
31. 25
32. How many positive integers less than 20 are equal to the sum of a positive multiple of 3 and a positive multiple of 4?
33. Two
34. Five
35. Seven
36. Ten
37. =
38. 1
39. 2
40. 4
41. 8
42. Which of the following is a multiple of both 7 and 13?
43. 65
44. 77
45. 156
46. 182
47. Lisa purchased $600 worth of traveler’s checks. If each check was worth either $20 or $50, which of the following CANNOT be the number of $20 checks purchased?
48. 10
49. 15
50. 18
51. 20

62. If 4x is less than 4y, then y – x =

1. -24
2. -3/2
3. -2/3
4. 3/2

63. The difference between two positive numbers is 16. If the smaller of these two numbers is 3/5 of the larger, what is the value of the smaller number?

1. 18
2. 24
3. 30
4. 40

64. (1 – x)(x – 1) =

1. -(x – 1)2
2. (x – 1)2
3. 0
4. 1 – x2

65. Which of the following values is NOT equal to 34(58+9)?

1. 34 x 67
2. 58(34+9)
3. 34 x 58 + 34 x 9
4. 1,972 + 306
5. (9 + 58) 34

66. Two angles of a triangle measure 15° and 85 °. What is the measure for the third angle?

1. 50°
2. 55°
3. 60°
4. 80°
5. 90°

67. If 5 ounces is equal to 140 grams, then 2 pounds of ground meat is equal to how many grams?

1. 863
2. 878
3. 896
4. 915
5. 932

68. Which of the following is equal to 5.93 x 10-2?

1. 0.0593
2. 0.00593
3. 593
4. 5930
5. 59300

69. On a Map, 1 inch represents 20 miles. The distance between 2 towns is 6 1/5 inches. How many miles are actually between the two towns?

1. 65 miles
2. 84 miles
3. 124 miles
4. 138 miles
5. 145 miles

70. Sarah is twice as old as her youngest brother. If the difference between their ages is 15 years. How old is her youngest brother?

1. 10
2. 15
3. 20
4. 25
5. 30

71. Which of the following fractions is equal to 5/6?

1. 20/30
2. 15/24
3. 25/30
4. 40/54
5. 2/7

72. In a writing competition, the first place winner receives ½ of the prize money. The second runner up receives ¼ of what the winner won. What was the total amount of prize money distributed if the winner receives $6,000?

1. $6,000
2. $8,500
3. $12,000
4. $15,000
5. $18,500

73. You are lying 120 ft away from a tree that is 50 feet tall. You look up at the top of the tree. Approximately how far is your hear from the top of the tree in a straight line?

1. 50 feet
2. 75 feet
3. 120 feet
4. 130 feet
5. 150 feet

74. A cyclist bikes x distance at 10 miles per hour and returns over the same path at 8 miles per hour. What is the cyclist's average rate for the round trip in miles per hour?

1. 8.1
2. 8.3
3. 8.6
4. 8.9
5. 9.0

75. If 3x + 5x = -8, then x + 1 =

1. -2
2. -1
3. 0
4. 1
5. 2

**SECTION-III**

**ENGLISH**

Section III: English has two subsections in it: (A) Vocabulary and (B) Reading Comprehension.

**Part A:** Vocabulary

Vocabulary section is further divided into four subsections: (A-1) Sentence Completion, (A-2) Analogy, (A-3) Synonyms, and (A-4) Antonyms.

**Part A-1:** Sentence Completion: For questions 76-80, choose the correct word or phrase that completes the sentence.

76. Today Wegener's theory is \_\_\_\_; however, he died an outsider treated with \_\_\_\_ by the scientific establishment.

* 1. unsupported – approval
  2. dismissed – contempt
  3. accepted – approbation
  4. unchallenged – disregard
     1. The revolution in art has not lost its steam; it \_\_\_\_ on as fiercely as ever.
  5. Trudges
  6. Rages
  7. Meanders
  8. Ambles
     1. Biological clocks are of such \_\_\_\_ adaptive value to living organisms, that we would expect most organisms to \_\_\_\_ them.
  9. obvious – possess
  10. clear - avoid
  11. meager - evolve
  12. significant - eschew

1. Each occupation has its own \_\_\_\_ ; bankers, lawyers and computer professionals, for example, all use among themselves language which outsiders have difficulty following.
   1. merits
   2. disadvantages
   3. jargon
   4. rewards
2. Thankfully the disease has gone into \_\_\_\_ ; it may not recur for many years.
   1. treatment
   2. remission
   3. quarantine
   4. sequestration

**Part A-2:** Analogy: For questions 80-85, choose from the options the word’s synonyms (similar in meaning).

1. ELEPHANT : HERBIVOROUS : :
   1. snail : mollusk
   2. quadruped : proboscis
   3. tiger : carnivorous
   4. dog : canine
2. EMPLOYEE : WAGES : :
   1. worker : jobs
   2. composer : symphony
   3. entrepreneur : profits
   4. negotiator : conflicts
3. NOVELIST : BOOK ::
   1. tailor : needle
   2. weaver : cloth
   3. unicorn : horn
   4. scientist : laboratory
4. EFFUSIVE : DEMONSTRATIVE : :
   1. downcast : dejected
   2. theoretical : experimental
   3. effective : defective
   4. pouring : choked
5. BURROW : RABBIT : :
   1. desert : camel
   2. shell : snail
   3. shed : cow
   4. nest : birds

**Part A-3:** Antonyms/Opposite Word: For questions 86-90, choose from the options the word’s antonyms (opposite in meaning).

1. INTEGRATE
   1. tolerate
   2. assume
   3. unite
   4. setter
2. AUXILLARY
   1. righteous
   2. prospective
   3. mandatory
   4. assistant
3. ACCEDE
   1. mollify
   2. consent
   3. fail
   4. correct
4. MEDIOCRE
   1. Average
   2. strong
   3. certain
   4. excellent
5. STRANGE
   1. error
   2. quaint
   3. true
   4. certain

**Part A-4:** Synonyms/Similar Word: For questions 91-95, choose from the options the word’s antonyms (opposite in meaning).

1. PAUCITY
   1. Piety
   2. Provoke
   3. Scarcity
   4. Insularity
2. IGNOMINY
   1. Dishonor
   2. Insolvent
   3. Opulence
   4. Isolation
3. INQUISITIVENESS
   1. Responsiveness
   2. Questioning
   3. Irrationality
   4. Usefulness
4. RIDICULE
   1. Important
   2. Despiteful
   3. Mockery
   4. Importance
5. COMPLACENT
   1. Satisfied
   2. Unsatisfied
   3. Complete
   4. Complainant

**Part B:** Reading Comprehension

Reading Comprehension section has only one paragraph for questions 95-100

**Paragraph**

The most familiar speleothems (from the Greek word spelaion for cave and thema for deposit), the decorative dripstone features found in caves, are stalactites and stalagmites. Stalactites hang downward from the ceiling of the cave and are formed as drop after drop of water slowly trickles through cracks in the cave roof. Stalagmites grow upward from the floor of the cave, generally as a result of water dripping from an overhead stalactite. A column forms when a stalactite and a stalagmite grow until they join. A "curtain" or "drapery" begins to form on an inclined ceiling when drops of water trickle along a slope. Natural openings on the surface that lead to caves are called sinkholes, or swallow holes. Streams sometimes disappear down these holes and flow through the cavern. Rivers may flow from one mountain to another through a series of caves. Some caverns have sinkholes in their floors. Water often builds up a rim of dripstone around the edge of the hole. Dripping water often contains dissolved minerals as well as acid. These minerals too will be deposited; and they may give rich coloring to the deposits. If minerals in the water change, layers of different colors may be formed.

1. Stalagmites are formed by
   1. drops of water which enter through cracks in the ceiling.
   2. underground rivers which flow through the cave.
   3. water dripping from an overhead stalactite.
   4. water which trickles down a slope.
2. Sinkholes are
   1. the decorative dripstone features found in caves.
   2. natural openings on the surface that lead to caves.
   3. colorful layers of mineral deposits.
   4. None of the above
3. Which speleothem grows upward from the floor?
   1. Stalagmite
   2. Stalactites
   3. Sinkholes
   4. Curtains
4. Which of the following are NOT caused by dripping water ?
   1. Stalagmites
   2. Stalactites
   3. Slopes
   4. Curtains
5. The information in the passage is most relevant to which field of study?
   1. Geography
   2. Archaeology
   3. Physics
   4. Geology

**ANSWER KEY**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Q No. | Ans | Q No. | Ans | Q No. | Ans | Q No. | Ans |
| 1 | c | 16 | b | 31 | b | 46 | c |
| 2 | a | 17 | c | 32 | d | 47 | a |
| 3 | a | 18 | c | 33 | c | 48 | b |
| 4 | c | 19 | a | 34 | b | 49 | c |
| 5 | a | 20 | d | 35 | c | 50 | d |
| 6 | b | 21 | b | 36 | d |  |  |
| 7 | c | 22 | c | 37 | b |  |  |
| 8 | b | 23 | d | 38 | d |  |  |
| 9 | d | 24 | c | 39 | c |  |  |
| 10 | a | 25 | c | 40 | b |  |  |
| 11 | a | 26 | b | 41 | e |  |  |
| 12 | a | 27 | e | 42 | e |  |  |
| 13 | a | 28 | c | 43 | b |  |  |
| 14 | b | 29 | b | 44 | e |  |  |
| 15 | c | 30 | d | 45 | b |  |  |