

PU M Tech Computational Biology

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The approximate number of genes in human is:-

- 35000
- 15000
- 22000
- 30000

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A text processing programming language used for data extraction and reporting is called as:-

- awk
- filter
- grep
- text Processor

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Command line interpreter in UNIX is called as:-

- Kernel
- Compiler
- Utility
- Shell

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A periplasmal tapetum is:-

- two layers of cells surrounding an another locule
- a triploid tissue that is liquid
- a multinucleate mass of protoplasm
- one layer of cells surrounding an anther locule

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If the resultant force acting on a body of constant mass is zero, the body's momentum is:-

- always zero
- constant
- Increasing
- decreasing

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The uptake of plasmid DNA into bacterial cell is facilitated by:-

- Sodium chloride

- Calcium chloride
- Magnesium chloride
- Potassium chloride

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What type of bond is found in the fatty acid tail of an unsaturated fat that is not found in the fatty acid tail of a saturated fat?

- a double bond
- a covalent bond
- a single bond
- an ionic bond

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During hypothesis testing, a researcher is usually interested in supporting:-

- Statistical inference
- Null Hypothesis
- Null and Alternative Hypotheses
- Alternative Hypothesis

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The standard deviation of a sampling distribution is known as:-

- Sample error
- Variance
- Standard error
- Sampling error

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Megaphylls:-

- developed from roots
- typically have no vein system
- are characteristically green
- are found only in seed plants

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A toy train moves in a circle of 8 meters radius with a speed of 4 meters per second. What is the magnitude of the acceleration of the train?

- 4 METERS PER SECOND SQUARED
- 6 METERS PER SECOND SQUARED
- 2 METERS PER SECOND SQUARED
- 8 METERS PER SECOND SQUARED

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Which of the following symbol represents a population parameter?

- SD
- R
- σ
- SE

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Mitochondria carry out oxidative phosphorylation by means of:-

- Conformational coupling
- Photophosphorylation
- Photorespiration
- Chemiosmotic coupling

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The deposit callose is best stained with:-

- toulidine blue-O
- safranin
- resourcin blue
- fast green

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The unique address of a web page is called as:-

- Web address
- Uniform resource locator
- Address locator
- Hyperlink

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A right triangle with sides 3 cm, 4 cm and 5 cm is rotated the side of 3 cm to form a cone. The volume of the cone so formed is:-

- $15\pi \text{ cm}^3$
- $16\pi \text{ cm}^3$
- $12\pi \text{ cm}^3$
- $18\pi \text{ cm}^3$

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What hormone is commonly expressed in transgenic livestock to increase their growth and productivity?

- bGH (bovine growth hormone)

- Insulin
- erythropoietin
- clotting factor VIII

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Software designed to protect a computer from unauthorized access through network is called as:-

- User Management
- Gateway
- Protocol
- Firewall

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The UNIX command 'mv protein.txt enzyme.txt' will:-

- Copy the contents of enzyme.txt to protein.txt
- Rename the file protein.txt to enzyme.txt
- Copy the contents of protein.txt to enzyme.txt
- Append the contents of protein.txt to enzyme.txt

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Hemolytic disease of the newborn caused by Rh blood group incompatibility requires maternal antibody to enter the fetal bloodstream. Therefore, the mediator of this disease is:-

- IgM
- IgE
- IgA
- IgG

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Induced electric currents can be explained using which of the following laws?

- Faraday's Law
- Gauss's Law
- Ohm's Law
- Ampere's Law

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The errors showed by the language compilers are called as:-

- syntax errors
- internal errors
- language errors
- logical errors

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As defined in physics, work is:-

- always a positive quantity
- a scalar quantity
- a vector quantity
- always zero

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When a physical property such as charge exists in discrete "packets" rather than in continuous amounts, the property is said to be:-

- discontinuous
- abrupt
- quantized
- noncontinuous

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The fruit of a cucumber is termed a(n):-

- achene
- hesperidium
- pepo
- drupe

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In DBMS collection of records make a:-

- Row
- Sheet
- Field
- Table

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Delesse conceived the idea that the area of a substance within a larger area is equivalent to the _____ within a larger volume.

- volume
- absolute area
- relative area
- surface density

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Which one of the following is NOT true about Random Access Memory? It is a/an:-

- Primary memory

- Randomly select any location of memory to store data
- Temporary storage
- Not possible to write fresh information into it

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A Newton is equal to which of the following?

- meter per second squared
- kilogram per meter-second
- kilogram-meter per second squared
- kilogram-meter per second

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SQL command to change some of the values of columns of a table is:-

- UPDATE
- MODIFY
- EDIT
- CHANGE

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For a negative point charge, the electric field vectors:-

- Point radially away from the charge
- Circle the charge
- Cross at infinity
- Point radially in toward the charge

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The work done by a friction force is:-

- Always zero
- Always negative
- Always positive
- Either positive or negative depending upon the situation

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DNA staining is done by:-

- Giesma staining
- Crystal violet
- Feulgen staining
- Methylene blue

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The C language construct that allows a variable to be tested for equality against a list of values is called as:-

- Continue
- Switch
- Break
- While

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The rate of synonymous nucleotide substitution is high at:-

- Fourth codon position
- Third codon position
- First codon position
- Second codon position

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Iron is what type of magnetic material? Is it:-

- paramagnetic
- diamagnetic
- ferromagnetic
- non-magnetic

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What is the hexadecimal equivalent of decimal number 123?

- B7
- 7C
- 7B
- C7

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Two forces have magnitudes of 11 newtons and 5 newtons. The magnitude of their sum could NOT be equal to which of the following values?

- 16 newtons
- 5 newtons
- 7 newtons
- 9 newtons

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In physics, a radian per second is a unit of:-

- Angular momentum

- Angular displacement
- Angular acceleration
- Angular velocity

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Connecting link between annelids and arthropods is:-

- Aplysia*
- Limulus*
- Peripatus*
- Neopilina*

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The conserved region in a homeotic gene is known as:-

- Homeobox
- Homeosplice
- Homeoregion
- Homeodomain

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Electric current may be expressed in which one of the following units?

- coulombs/volt
- joules/coulomb
- coulombs/second
- ohms/second

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Work is equal to which of the following?

- The dot product of force and displacement
- The product of force times time
- The cross product of force and displacement
- Force divided by time

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Which one of the following statement is NOT true? UNIX command cat will:-

- Combining two or more files
- Removing the given file
- Display the content of a given file
- Creating new files

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An application software with rectangular grid, which allows text, numbers, and complex functions to be entered into a matrix of thousands of individual cells is called as:-

- Word document
- Printed document
- Spread Sheet
- Photo editor

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The UNIX command 'head -n 5 protein.txt' will display the:-

- first five lines of the file protein.txt
- first five columns of the file protein.txt
- last five columns of the file protein.txt
- last five lines of the file protein.txt

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The force acting between two point charges can be computed using which of the following laws?

- Ohm's Law
- Ampere's Law
- Newton's Second Law
- Coulomb's Law

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Computer file system architecture FAT stands for:-

- File Access Table
- File Access Track
- File Allocation Table
- File Allocation Track

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C function that allocates memory is:-

- allow()
- malloc()
- free()
- memo()

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An S2 layer of a cell wall is found:-

- outside of S1 layer

- adjacent to the cell membrane
- adjacent to vacuolar membrane (tonoplast)
- outside of S3 layer

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If the frequency of two alleles in a Hardy Weinberg population is 0.6 and 0.4, the frequency of heterozygote genotype is:-

- 1.00
- 0.48
- 0.24
- Zero

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Use of alkaline phosphatase is to:-

- Remove terminal phosphates from both end
- Not related to the removal of terminal phosphates
- Remove terminal phosphates from 3'end
- Remove terminal phosphates from 5'end

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Telomeric sequences are found in:-

- HAC
- PAC
- YAC
- BAC

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A class of binary encodings of decimal numbers where each decimal digit is represented by a fixed number of bits four or eight is called as:-

- Binary Coded Decimal
- Binary Digit
- Binary Encoded
- Binary Number

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The standard error can be minimized by:-

- Stratified sampling
- Repeated sampling
- Small sampling
- Large sampling

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Data that does not change throughout the program/algorithm is called as:-

- Constant
- Vector
- Scalar variable
- Variable

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What is the binary equivalent of decimal number 36?

- 100111
- 100110
- 100101
- 100100

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Dendritic branches within the cuticle are composed of:-

- suberin
- protein
- lipids
- polysaccharides

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The UNIX command that allows one to search one file or multiple files for lines that contain a pattern is called as:-

- search
- grep
- where
- findfile

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The cut-off to decide the rejection of a null hypothesis is:-

- Gamma level
- Delta level
- Beta level
- Alpha level

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HPLC uses the following for detection:-

- UV light

- gamma-rays
- X-rays
- IR rays

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The hysteresis cycle for the material of a permanent magnet is:-

- short and wide
- short and narrow
- tall and narrow
- tall and wide

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When compared to Red light, blue light has:-

- Equal energy
- Lower energy
- Higher energy
- Medium energy

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The time period of a communication satellite is:-

- 1 hour
- 24 hours
- 30 days
- 365 days

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Average kinetic energy of molecules is:-

- Inversely proportional to absolute temperature
- Directly proportional to absolute temperature
- Directly proportional to square of absolute temperature
- Inversely proportional to square of absolute temperature

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Thermal expansion of a material:-

- occurs at the same rate for all liquids and gases
- occurs only in solids
- increase the weight of the material
- decreases the density of the material

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The slope of the graph plotted with potential energy against vertical position represents:-

- weight of the body
- acceleration
- velocity
- kinetic energy

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A car starts from rest with a constant acceleration of 10 ms^{-2} . The velocity of that car after traveling for half a kilometer will be:-

- $\sqrt{10} \text{ ms}^{-1}$
- 100 ms^{-1}
- 5 ms^{-1}
- 50 ms^{-1}

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R – O – R represents which class of organic compounds?

- esters
- alcohols
- acids
- ethers

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Which of the following supports the transverse nature of the light wave?

- polarization
- interference
- diffraction
- wave motion of light

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Which compound is a saturated hydrocarbon?

- ethene
- ethanol
- ethyne
- ethane

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According to Curie-Weiss law, the susceptibility of a paramagnetic material with absolute temperature T is:-

- $\chi \propto T^2$

- $\chi \propto T^{-2}$
- $\chi \propto T$
- $\chi \propto T^{-1}$

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Length of covalent bond is in the order of:-

- cm
- m
- mm
- A

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If a capacitor of capacity C is charged with charge Q at a potential of V, then the potential energy stored in the capacitor is:-

- QV
- $\frac{1}{2} CV$
- $\frac{1}{2} QV$
- CV

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pH is a measure of:-

- pressure of hydrogen
- hydrogen ion concentration
- hydroxyl ion concentration
- All the above

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If a particle moves in a circle describing equal angles in equal intervals of time, the velocity vector:-

- remains constant
- changes in magnitude
- changes in direction
- changes both in direction and magnitude

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A square metallic loop of side 'a' and carries a current i. The magnetic field at the centre of the loop is:-

- $\propto a$
- $\propto 1/a$
- $\propto a^2$
- independent of a

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As per Kepler's third law, the square of the time period of a planet circulating in an orbit of radius R is proportional to:-

- R^2
- R^3
- R
- R^{-2}

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R – OH represents which class of organic compounds?

- alkanes
- acids
- alcohols
- ethers

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The flux leaving any closed surface per unit volume in a vector field A is:-

- zero
- div A
- curl A
- grad A

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The correct order of increasing bond length of C – H, C – O, C – C and C = C is:-

- $\tilde{C}H < C=C < C-O < \tilde{C}C$
- $\tilde{C}H < \tilde{C}O < C-C < C=C$
- $\tilde{C}O < \tilde{C}H < \tilde{C}C < C=C$
- $\tilde{C}C < C=C < \tilde{C}O < \tilde{C}H$

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In aqueous solution glucose remains as:-

- Only in open chain form
- Only in furanose forms
- Only in pyranose form
- In all three forms in equilibrium

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Tautomers have:-

- a) Same chemical formula

- b) Same physical properties
- c) Both (a) and (b)
- d) Different chemical formula

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Insulin regulates the metabolism of:-

- glucose
- vitamins
- amino acids
- minerals

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At a certain location in a gene, the non-template strand of DNA has the sequence GAA. A mutation alters the triplet to GAG. This type of mutation is called:-

- nonsense
- missense
- frame-shift
- silent

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ClogP is a measure of:-

- Log
- Reactivity
- Pressure
- Liphophilicity

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Which one of the following is a covalent crystal?

- Ice
- Rock salt
- Dry ice
- Quartz

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AIDS is caused by a human retrovirus that specifically binds and kills:-

- B lymphocytes.
- CD4+ T lymphocytes
- Neutrophils
- CD8+ T lymphocyte

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Heterochromatin:-

- is responsible for all negative transcriptional control
- clumps the X chromosome in human males
- contains more DNA than does euchromatin
- is transcriptionally inactive

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Stereoisomers:-

- have different chemical formula
- are mirror images
- are non super-imposable mirror images
- all the above

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Geometrical isomers have:-

- a) same chemical formula
- b) same physical properties
- c) Both (a) and (b)
- d) Different physical properties

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A Barr body in human beings is:-

- the active X chromosome in a female somatic cell
- the inactive X chromosome in a female somatic cell
- the inactive Y chromosome in a male cell
- the active X chromosome in a male somatic cell

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Which is a peptide bond?

- $-\text{CH}_2-\text{NH}_2$
- $-\text{CO}-\text{NH}-$
- $-\text{CH}_2-\text{O}-\text{CH}_2-$
- $-\text{CH}_2-\text{CH}_2-$

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The number of disulphide linkages present in insulin are:-

- 1
- 4

- 3
- 2

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Glucose contains in addition to aldehyde group:-

- three primary OH and two secondary OH groups
- one secondary OH and four primary OH groups
- one primary OH and four secondary OH groups
- two primary OH and three secondary OH groups

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During the formation of a chemical bond:-

- energy increases
- electron-electron repulsion becomes more than the nucleus-electron attraction
- energy of the system does not change
- energy decreases

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Which is a characteristic of dicots?

- Parallel leaf veins
- Roots develop from radicle
- Secondary growth usually absent
- Flower parts in multiples of three

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Which best describes plasmids?

- Plasmids are transgenic bacteria
- Plasmids are enzymes used to cut DNA at specific locations
- Plasmids are clones of bacteria or DNA segments
- Plasmids are circular pieces of DNA that can be used to carry foreign DNA into cells such as bacteria

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Allosteric inhibition of an enzyme involves which of the following?

- Cooperative binding of substrate to an enzyme that does not deviate from normal Michaelis-Menten kinetics
- Cooperative binding of a substrate to an enzyme with four or more subunits
- Binding of an inhibitor to a site other than the substrate binding site
- Binding of an inhibitor competitively to the substrate binding site

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Antibodies are:-

- also called as immunoglobulins
- glycoproteins made of heavy and light chains
- produced by B cells differentiated into plasma cells
- All of the above