PU Ph D Bioinformatics

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121 PU_2015_104
A primary component of the exine is:-

- sporopollenin
- callose
- lignin
- cellulose

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167 PU_2015_104
When a person stands on a scale in an elevator at rest, the scale reads 800 newtons. When the elevator is allowed to fall freely with acceleration of gravity, the scale reads one of the following. Does the scale read:-

- 400 newtons
- 1600 newtons
- 800 newtons
- 0 newtons

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101 PU_2015_104
Which of the following organelles in human sperm provides the energy needed by the sperm?

- Centriole
- mitochondria
- flagellum
- Y chromosome

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182 PU_2015_104
The curved surface area of a right circular cylinder of base radius r is obtained by multiplying its volume by :-

- 2/r
- 2r
- 1/r
- $2r^2$

5 of 100
108 PU_2015_104
The action of pepsin requires a medium which is:-

- acidic
- neutral

- alkaline
- watery

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181 PU_2015_104

If $\sin\theta = -4/5$ and $180° < \theta < 270°$ then find $\sin \theta/2$.

- $-2/\sqrt{5}$
- $4/\sqrt{5}$
- $2/\sqrt{5}$
- $1/\sqrt{5}$

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204 PU_2015_104

Which of the following represents the relationship between magnetic, electric and optical wave propagation quantities?

- $c = (\mu_0\varepsilon_0)$
- $c = \sqrt{(\mu_0\varepsilon_0)}$
- $c = (\mu_0\varepsilon_0)^2$
- $c = 1/\sqrt{(\mu_0\varepsilon_0)}$

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107 PU_2015_104

The base of the food web of the open ocean is provided by:-

- phytoplankton
- kelp
- zooplankton
- whales

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180 PU_2015_104

Find the equation to the straight line cutting off an intercept of 5 units on negative direction of y-axis and being equally inclined to the axes:-

- $y = \pm x + 5$
- $y = \pm x - 5$
- $x+y=0$
- $y=5-x$

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165 PU_2015_104

The major reason that antiparallel β-stranded protein structures are more stable than parallel β-stranded structures is that the latter:-

- Do not have as many disulfide crosslinks between adjacent strands
- Have fewer lateral hydrogen bonds than antiparallel strands
- Have weaker hydrogen bonds laterally between adjacent strands
- Are in a slightly less extended configuration than antiparallel strands

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146 PU_2015_104

A car starts from rest and accelerates uniformly over a time of 5.21 seconds for a distance of 110 m. Determine the acceleration of the car:-

- 8.10 m/s^2
- 1.80 m/s^2
- 13.57 m/s^2
- 5.10 m/s^2

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162 PU_2015_104

Pharmacophore constraints speed up docking because:-

- The time for geometry refinement is reduced
- The number of ligand conformations and docked orientations is reduced
- The number of docked orientations (or poses) is reduced
- The number of ligand conformations processed is reduced

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200 PU_2015_104

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:-

- ½ QV^2
- ½ CV^2
- CV
- QV

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129 PU_2015_104

Bacteria are the "workhorses" of genetic engineering because they _____.

- can readily take up plasmids containing human genes and then produce the human proteins encoded by those genes
- reproduce very slowly and accurately
- are always homozygous
- they provide the polymerase for the polymerase chain reaction

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169 PU_2015_104
The characteristic that distinguishes a laser beam from an ordinary light beam is:-

- The color of the laser beam
- The coherence of the laser beam
- The greater polarization of the laser beam
- The greater frequency of the laser beam

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106 PU_2015_104
Memory is the responsibility of the:-

- Cerebrum
- Spinal cord
- Prefrontal area
- Medulla oblongata

17 of 100
141 PU_2015_104
Liquid nitrogen is a poor freezing agent for microscopy since it:-

- has a high temperature range between its freezing and boiling points.
- readily forms a vapor upon contact with warm substances.
- is not colder than ice of water.
- freezes too rapidly.

18 of 100
120 PU_2015_104
How does the scanning electron microscope differ from the transmission electron microscope? It:-

- uses electromagnetic lenses.
- maps images rather than optically projecting them
- operates with a vacuum.
- uses an electron beam.

19 of 100
128 PU_2015_104
What was the first human genetic disease that was successfully treated with gene therapy?

- Down syndrome
- SCID (ADA deficiency)
- sickle-cell anemia
- cystic fibrosis

20 of 100

161 PU_2015_104

Shotgun cloning differs from the clone-by-clone method in which of the following ways?

- The entire genome is sequenced in the clone-by-clone method, but not in shotgun sequencing
- Genetic markers are used to identify clones in shotgun cloning
- The location of the clone being sequenced is known relative to other clones within the genomic library in shotgun cloning
- Computer software assembles the clones in the clone-by-clone method

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124 PU_2015_104

Which is not a characteristic of the fixative agent, glutaraldehyde?

- An organic compound
- A dialdehyde
- A coagulant fixative
- Soluble in water

22 of 100

148 PU_2015_104

Haemoglobin contains 0.33% of iron, if one molecule of haemoglobin contains 4 atoms of iron, the approximate molecular weight of haemoglobin will be:-

- 76700
- 67700
- 6770
- 34000

23 of 100

104 PU_2015_104

Diphtheria and Polio can be prevented by:-

- Proper disposal of wastes
- Drinking boiled water
- using proper sanitation facilities
- Immunization with toxoids/vaccines

24 of 100

163 PU_2015_104

The percentage of false positives in Structure-based Virtual Screening software is typically:-

- 50-75%
- 25-50%
- <25%

- >75%

25 of 100

168 PU_2015_104

The relationship between kinetic energy and the potential energy of a swinging pendulum bob is one of the following. Is it:-

- Kinetic energy is equal to potential energy
- Kinetic energy is greater than potential energy
- Kinetic energy plus potential energy equals a constant
- Kinetic energy is less than potential energy

26 of 100

188 PU_2015_104

The mean of marks in Mathematics of 100 students in a class was 72. The mean of marks of boys was 75, while their number was 70, Find out the mean marks of girls in the class.

- 70
- 55
- 65
- 75

27 of 100

166 PU_2015_104

A machine performs 8 Joules of work in 2 seconds. How much power is delivered by this machine?

- 2 WATTS
- 4 WATTS
- 6 WATTS
- 8 WATTS

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201 PU_2015_104

Thermal expansion of material:-

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

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100 PU_2015_104

An organism is examined and is found to be multicellular and heterotrophic and to have cell walls made of a substance other than cellulose. The organism belongs to which of the following kingdoms?

- fungi

- monera
- plantae
- Protista

30 of 100

209 PU_2015_104

Which of the following is true in respect of a LASER?

- It is a monochromatic and coherent light.
- It is a beam of white light.
- It is an incoherent and high intensity light.
- It produces γ -rays.

31 of 100

144 PU_2015_104

Nick translation is done by:-

- DNA polymerase I
- DNA ligase
- Kinase
- DNA polymerase II

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105 PU_2015_104

The ribosomes of a cell are of primary importance for:-

- DNA replication
- transcription
- translation
- repression

33 of 100

207 PU_2015_104

Which of the following is not Maxwell's equation?

- $\nabla . B = 0$
- $\nabla . D = \rho$
- $\nabla \times H = J + D$
- $\nabla E = - B$

34 of 100

122 PU_2015_104

Which is a linear polysaccharides?

- Starch

- amylose
- Cellulose
- Glycogen

35 of 100

205 PU_2015_104

In order to propagate light in a waveguide, its frequency should be:-

- zero
- greater than cut-off frequency
- less than cut-off frequency
- equal to cut-off frequency

36 of 100

143 PU_2015_104

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

- bGH (bovine growth hormone)
- Insulin
- erythropoietin
- clotting factor VIII

37 of 100

184 PU_2015_104

A bag contains 2 red, 3 green and two blue balls. Two balls are drawn at random. What is the probability that none of the balls is blue?

- 10/21
- 5/7
- 2/7
- 11/21

38 of 100

186 PU_2015_104

The roots of the equation $x^3 - 7x^2 + 36 = 0$, given that one root is double of another, are:-

- -3, 6, 2
- -3, 6, -2
- 3, 6, -2
- 3, -6, 2

39 of 100

123 PU_2015_104

Organisms that have been genetically engineered to carry one or more foreign genes are known as _____.

- ligated organisms
- Plasmids
- transgenic organisms
- homogeneous organisms

40 of 100

126 PU_2015_104

Cyclins are proteins involved in regulation of:-

- membrane circulation via exocytosis and endocytosis
- synthesis of cAMP
- circadian rhythms
- cell-cycle protein kinases

41 of 100

103 PU_2015_104

Today's worldwide human population can be described as:-

- fluctuating near equilibrium
- oscillating
- growing exponentially
- declining

42 of 100

140 PU_2015_104

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:-

- IgA
- IgE
- IgM
- IgG

43 of 100

185 PU_2015_104

A student takes 60 question multiple-choice exam, with four choices per question. If one of the choices is obviously incorrect and the student makes an 'educated' guess of the remaining choices then what will be expected number of correct answers?

- 15
- 20
- 25
- 30

44 of 100

145 PU_2015_104

Which of the following statements is correct?

- Alcohols have OH group attached to sp^2 hybridized carbon atom
- Enols have OH group attached to sp^3 hybridized carbon atom
- Phenols have OH group attached to a carbocyclic non-aromatic ring
- None of these

45 of 100

147 PU_2015_104

Which one of the following is the correct expression?

- Weight of an atom = one gm/6.023×10^{23}
- Absolute mass of an atom in gm =Atomic wt. in a.m.u $\times$ 1.66×10^{-24}gm
- 1 a.m.u. = Mass of one ^{12}C atom
- Atomic wt. =Mass of an atom/Mass of ^{12}C atom

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125 PU_2015_104

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

- Calcium chloride
- Potassium chloride
- Sodium chloride
- Magnesium chloride

47 of 100

203 PU_2015_104

A car starts from rest with a constant acceleration of 5 ms^{-2}. The velocity of that car after traveling for 1 km will be:-

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

48 of 100

160 PU_2015_104

The dipole moments of BF_3, H_2S and H_2O can be arranged as:-

- $BF_3 < H_2S > H_2O$
- $BF_3 > H_2S > H_2O$
- $BF_3 > H_2O < H_2S$
- $BF_3 < H_2S < H_2O$

49 of 100
189 PU_2015_104
The coordinates of the points which divide the line segment joining the points (2,-4,3), (-4,5,6) in the ratio 2:1 is:-

- -2,2,-5
- 2,-2,-5
- -2,2,5
- 2,2,5

50 of 100
187 PU_2015_104
The price of certain article becomes 1.5 times in first years, 1.625 times in the second years and 0.77 times in the third years. What is the average change per year?

- 1.8 times
- 1.6 times
- 1.9 times
- 1.238 times

51 of 100
109 PU_2015_104
The gene for a particular trait that is passed only from fathers to sons is most likely:-

- Y-linked
- X-linked
- autosomal recessive
- autosomal dominant

52 of 100
164 PU_2015_104
Semi empirical method of quantum mechanical calculations among the following is:-

- B3LYP
- MP2
- PM3
- MP3

53 of 100
127 PU_2015_104
What determines the way a protein will fold up to form the tertiary structure?

- interactions with DNA and RNA
- the quaternary structure of the protein
- the placement of polar and charged groups in the chain of amino acids

- interactions with lipid molecules

54 of 100

202 PU_2015_104

A stationary charge can produce:-

- both electric and magnetic fields
- electric field only
- magnetic field only
- neither electric field nor magnetic field

55 of 100

206 PU_2015_104

If $\Phi = \frac{1}{2}(x^2 + y^2 + z^2)$, then grad Φ is:-

- symmetric vector
- a null vector
- unit vector
- position vector

56 of 100

102 PU_2015_104

Which of the following are the final products of fermentation?

- carbon dioxide and oxygen
- glucose and alcohol
- carbon and oxygen
- carbon dioxide and alcohol

57 of 100

183 PU_2015_104

If $\sec\theta = x + 1/4x$ then $\tan\theta + \sec\theta$ is equal to:-

- 8x
- 4x
- x
- 2x

58 of 100

142 PU_2015_104

Agar-agar is obtained from:-

- Polysiphonia
- Laminaria
- Gelidium

- Fucus

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149 PU_2015_104

An α- helix can be recognized in the 3-dimensional structure of a protein on the basis of:-

- φ, Ψ angles of alternative residues
- Hydrogen bonding between consecutive residues
- Hydrogen bonding pattern (n to n+4) and φ, Ψ angles of a stretch of residues
- The absence of β sheet in the structure

60 of 100

208 PU_2015_104

The hysteresis curve is, in general, studied for:-

- paramagnetic material
- non-magnetic materials
- diamagnetic materials
- ferromagnetic materials

61 of 100

252 PU_2015_104

A protein showing molecular clock is:-

- Hemoglobin
- Cytochrome c
- Myoglobin
- Cytochrome b

62 of 100

232 PU_2015_104

Which of the following terms is used to describe the dose of a drug required to kill 50% of a group of animals?

- ED50
- LD50
- LD1
- ED99

63 of 100

231 PU_2015_104

Which of the following statements best describes pharmacokinetics ?

- The study of how a drug interacts with its target binding site at the molecular level.
- The study of which functional groups are important in binding a drug to its target binding site and the identification of a pharmacophore.

- The study of how drugs can be designed using molecular modeling based on a drug's pharmacophore.
- The study of how drugs reach their target in the body and how the levels of a drug in the blood are affected by various factors.

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257 PU_2015_104

A gene desert in a genome contains:-

- Low number of genes
- High number of disease genes
- Low number of essential genes
- High number of dispensable genes

65 of 100

250 PU_2015_104

A chronogram has a scale showing:-

- Time
- Number of substitutions per site
- Dimension
- Number of substitutions

66 of 100

220 PU_2015_104

On an average new drug development takes around:-

- 1 years
- 2 years
- 10 years
- 25 years

67 of 100

230 PU_2015_104

Which of the following statements best describes pharmacodynamics?

- The study of which functional groups are important in binding a drug to its target binding site and the identification of a pharmacophore.
- The study of how a drug interacts with its target binding site at the molecular level.
- The study of how drugs can be designed using molecular modelling based on a drug's pharmacophore.
- The study of how drugs reach their target in the body and how the levels of a drug in the blood are affected by absorption, distribution, metabolism and excretion.

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259 PU_2015_104

A genetic change that is completely fixed in a population:-

- Substitution
- Recombination
- Mutation
- Polymorphism

69 of 100

239 PU_2015_104

What term is applied to a drug which is effective against a relatively rare medical problem?

- Parent drug
- Orphan drug
- New chemical entity
- Lead compound

70 of 100

254 PU_2015_104

A branch length in a maximum likelihood tree is represented by:-

- Total number of sites
- Total number of substitutions
- Number of substitutions per site
- Number of sites per substitution

71 of 100

222 PU_2015_104

tPSA measures:-

- toxicity of a compound
- polarity of a compound
- activity of a compound
- lipophilicty of a compound

72 of 100

253 PU_2015_104

“Bootstrap” is a statistical test to measure confidence of a:-

- Node
- Branch
- Clade
- Root

73 of 100

258 PU_2015_104

A genetic change that occurs between 1% to 99% of individuals in a population:-

- Recombination
- Substitution
- Polymorphism
- Mutation

74 of 100

221 PU_2015_104

Docking, Scoring and Ranking is involved in:-

- both virtual screening and structure-based drug design
- Virtual screening
- Structure-based drug design
- none of the above

75 of 100

223 PU_2015_104

During Drug discovery process, INDA need to be applied:-

- before discovering the drug
- before testing the drug in humans
- before marketing the drug
- before testing the drug in animals

76 of 100

233 PU_2015_104

What is the term used for the automated in vitro testing of large numbers of compounds using genetically modified cells?

- robotic testing
- nanotechnology
- high throughput screening
- multiscreening

77 of 100

256 PU_2015_104

Bayesian tree is statistically better than maximum likelihood tree because Bayesian inference tree has:-

- Less type I error
- Less type I error and more type II error
- More type I error and less type II error
- More type I error

78 of 100

255 PU_2015_104
Bayesian inference tree is based on:-

- MBMC
- MBMB
- MCMB
- MCMC

79 of 100

224 PU_2015_104
ADME property of a drug determines:-

- What is the target of the drug
- How much drug will reach systemic circulation
- If it can be given to children
- If it can interact with the drug target

80 of 100

251 PU_2015_104
The concept of Molecular clock was proposed by:-

- Nei and Li
- Kumar and Nei
- Tamura and Li
- Zuckerkandl and Pauling

81 of 100

299 PU_2015_104
Which one does not have a client/server architecture:-

- DBMS
- RDBMS
- DBS
- All of these

82 of 100

263 PU_2015_104
Kinesin and dynein are most likely to be found in cellular transport associated with:-

- the plasma membrane
- microfilaments
- desmosomes
- microtubules

83 of 100

296 PU_2015_104
What is Tm?

- Trade mark
- Maximum temperature
- Melting temperature
- None of the above

84 of 100

288 PU_2015_104
The following is classified as essential amino acid:-

- Tyrosine
- Asp
- Proline
- Threonine

85 of 100

261 PU_2015_104
The DNA sequence used for barcoding animals is:-

- 18S rDNA
- Cox I
- Cox II
- 16 rDNA

86 of 100

274 PU_2015_104
A Barr body in human beings is:-

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

87 of 100

281 PU_2015_104
A statistical test to determine the normal distribution in a sample is:-

- Shapiro-Wilk Test
- Kolmogorv-Smirnov Test
- Fisher Test
- Student's t-test

88 of 100

270 PU_2015_104
Which of the following statements is FALSE about water?

- Water has a low dielectric constant.
- Water has a permanent dipole moment.
- Water is more dense in its liquid than in it crystalline form.
- Water functions simultaneously as a hydrogen bond donor or acceptor.

89 of 100

287 PU_2015_104
α -helix in coiled coil has ….. per turn:-

- 3.5 residue
- 3 residue
- 3.6 residue
- 3.4 residue

90 of 100

298 PU_2015_104
Stereoisomers:-

- are mirror images
- have different chemical formula
- are non-superimposable mirror images
- All the above

91 of 100

271 PU_2015_104
Telomerase:-

- Is a form of RNA polymerase.
- Cleaves the telomeres on chromosomes.
- Alters rRNA for catalytic function in ribosomes.
- Synthesizes DNA at the end of chromosomes.

92 of 100

273 PU_2015_104
“Bootstrap” is a statistical test in phylogenetics to measure confidence of a:-

- Node
- Clade
- Root
- Branch

93 of 100

280 PU_2015_104
Which of the following is a coagulant?

- Osmium tetroxide
- Formaldehyde
- Glutaraldehyde
- Ethanol

94 of 100

297 PU_2015_104
A hub node in a biological network is characterized by:-

- Average degree
- Moderate degree
- Low degree
- High degree

95 of 100

260 PU_2015_104
The DNA sequences commonly used for phylogenetic analysis in bacteria are:-

- 60S rDNA
- 18S rDNA
- 16S rDNA
- 45S rDNA

96 of 100

262 PU_2015_104
Which “system” is most likely to have the highest entropy?

- a plasma membrane
- ice cubes
- an (helical protein
- sugar molecules in hot tea

97 of 100

282 PU_2015_104
Which one of the following statement is TRUE about Anthrax:-

- It is caused by protozoan
- It is a zoonotic disease
- It is caused by fungi
- It is caused by virus

98 of 100

295 PU_2015_104
Which is a peptide bond?

- $–CH_2-NH_2$
- $–CH_2-O-CH_2-$
- –CO-NH-
- $–CH_2-CH_2-$

99 of 100

272 PU_2015_104
The urea cycle occurs in cell compartments:-

- endoplasmic reticulum and Golgi complex
- mitochondrion and lysosome
- mitochondrion and cytoplasm
- peroxisome and Golgi complex

100 of 100

264 PU_2015_104
The optical activity of a molecule is described by which of the following?

- R-
- E-
- S-
- D-