102 PU – Ph.D. Biochemistry and Molecular Biology

1 of 100
117 PU_2016_102_E
Which one of the following proteins is found in the thick filaments of skeletal muscle?

- α-actinin
- Myosin
- Troponin
- Tropomyosin

2 of 100
129 PU_2016_102_E
Ti plasmids belong to a:-

- Virus
- Lambda phage
- Yeast
- Natural bacterium

3 of 100
132 PU_2016_102_E
Tetany is caused due to dietary deficiency of:-

- Calcium
- Vitamin A
- Vitamin D
- Iodine

4 of 100
133 PU_2016_102_E
Second largest gland of the body is:-

- Thyroid
- Pitutary
- Liver
- Pancreas

5 of 100
140 PU_2016_102_E
For an enzyme that displays Michaelis-Menten kinetics, at [S] = $0.5K_m$ the reaction velocity, V_0 as a percentage of V_{max} will be:-

- 100%
- 20%
- 33.3%

- [ ] 50%

6 of 100

145 PU_2016_102_E

When both the volume and the pressure of a gas are doubled, the temperature will :-

- [ ] decrease to one fourth of its original value.
- [ ] increase by four times its original value.
- [ ] stay the same as its original value.
- [ ] increase by two times its original value.

7 of 100

124 PU_2016_102_E

The drug which prevents uric acid synthesis by inhibiting the enzyme xanthine oxidase is:-

- [ ] Colchicine
- [ ] Aspirin
- [ ] Allopurinol
- [ ] Probenecid

8 of 100

158 PU_2016_102_E

Which of the following carboxypeptidase works well in hydrolyzing the C terminal peptide bond except when there are proline, arginine, and lysine residues?

- [ ] carboxypeptidase C.
- [ ] carboxypeptidase A
- [ ] carboxypeptidase B
- [ ] carboxypeptidase Y.

9 of 100

112 PU_2016_102_E

Proteins may be separated according to size :-

- [ ] Molecular exclusion chromatography
- [ ] SDS-PAGE
- [ ] Ion exchange chromatography
- [ ] Isoelectric focussing

10 of 100

105 PU_2016_102_E

The yield of ATP/glucose unit in glycolysis with glycogen as the glucose source is:-

- [ ] 2.5
- [ ] 4.0

- 2.0
- 3.0

11 of 100

144 PU_2016_102_E

Arrhenius principle:-

- Identifies products of a chemical reaction
- Relates the effect of changes in concentration of chemical substances in equilibrium
- Relates the rates of chemical reactions to temperature
- Relates the effect of catalysts on the position of equilibrium of reversible reactions

12 of 100

136 PU_2016_102_E

Which one of the following is a congenital disease?

- Night-blindness
- Allergy
- Alkaptonuria
- AIDS

13 of 100

153 PU_2016_102_E

The ras-induced bladder cancer is caused by:-

- Inducing p53 mutations
- A single DNA base change in the normal ras protein
- Preventing phosphorylation of Rb protein
- Inducing the transcription of p21 proteins

14 of 100

104 PU_2016_102_E

The reduction-oxidation (Redox) potentials of NADH and $FADH_2$ show that the following reaction is spontaneous:-

- a) $FADH_2$ + NAD_2 --> FAD + NADH
- b) $FADH_2$ + $NADP_2$ --> FAD + NADPH
- c) NADH + FAD --> NAD_2 + FADH2
- d) Reactions a) and b) are both spontaneous

15 of 100

128 PU_2016_102_E

Atropa belladama produces atropine which acts as a:-

- Muscle relaxant

- Insecticidal
- Sweetner
- Dye

16 of 100

109 PU_2016_102_E

Which of the following enzymes can polymerize deoxyribonucleotides into DNA?

- DNA ligase
- Reverse transcriptase
- Primase
- DNA gyrase

17 of 100

100 PU_2016_102_E

Kinetin is a _____.

- Node forming agent
- Shoot inducing agent
- Bud forming agent
- Root inducing agent

18 of 100

116 PU_2016_102_E

Opsonins include _____.

- IFNγ
- C3b
- Perforin
- C9

19 of 100

154 PU_2016_102_E

The p53 gene is responsible for:-

- Initiating transcription of p21 which binds to cyclins
- Over riding the G1 checkpoint
- Damaging DNA
- Triggering cells to grow uncontrollably

20 of 100

120 PU_2016_102_E

The specific activity of an enzyme would be reported in which of the following units of measure?

- Units of activity per milligram of protein

- Units of activity per minute
- Millimoles per liter
- Micromoles per minute

21 of 100

121 PU_2016_102_E

A non-competitive inhibitor of an enzyme:-

- Decreases Vmax
- Increases K*m* with no or little change in Vmax
- Increases Vmax
- Decreases K*m* and decreases Vmax

22 of 100

150 PU_2016_102_E

Aedes aegypti is a vector for:-

- Dengue fever
- Typhoid fever
- Malaria
- Salmonellosis

23 of 100

108 PU_2016_102_E

Following ultraviolet damage of DNA in skin:-

- Both strands are cleaved
- A specific excinuclease detects damaged areas
- Purine dimers are formed
- Endonuclease removes the strand

24 of 100

101 PU_2016_102_E

Bed volume is calculated from the following formula:-

- 2 pi r
- pi r2 h
- Cube root of 4
- 4/3 pi r3

25 of 100

125 PU_2016_102_E

Spider webs are made of the strong and pliable protein called :-

- Fibroin

- Chitin
- Keratin
- Flagellin

26 of 100

113 PU_2016_102_E

The greatest buffering capacity at physiologic pH would be provided by a protein rich in which of the following amino acids?

- Lysine
- Aspartic acid
- Valine
- Histidine

27 of 100

141 PU_2016_102_E

If three identical dice are rolled, the probability of the same number appearing on each of them is:-

- 1/36
- 1/18
- 1/12
- 1/6

28 of 100

137 PU_2016_102_E

Ovule is attached to placenta by a slender stalk called:-

- Funicle
- Petiole
- Pedicel
- Placenta

29 of 100

148 PU_2016_102_E

Allopurinol is a suicide substrate of :-

- Inositol monophosphatase
- Succinate dehydrogenase
- Xanthine oxidase
- Dihydrofolatereductase

30 of 100

157 PU_2016_102_E

Fanconi anemia is a rare autosomal recessive disorder caused by :-

- apoptosis
- Cell cycle arrest
- autophagy
- defects in DNA repair

31 of 100

103 PU_102 new_E

Single letter code of pyrrolysine is _____.

- B
- J
- O
- U

32 of 100

145 PU_102 new_E

Which of the following statement is incorrect about photosystems:-

- the reaction center of PS I is P700 with Chl a being predominant pigment
- Both photo systems are localized to the outer membrane
- the reaction center of PS II is P680 with Chl b being predominant pigment
- PS I is located on the thylakoid membrane

33 of 100

148 PU_102 new_E

The major amino acids in histones are:-

- Glutamic acid and Aspartic acid
- Histidine, Arginine and Lysine
- Lysine and Arginine
- Histidine, Tyrosine and Tryptophan

34 of 100

139 PU_102 new_E

The number of copies of mRNA present in a cell can be assessed by:-

- SAGE
- Oligonucleotide array
- RNA footprinting
- Bandshift assay

35 of 100

115 PU_102 new_E

Which of the following is a common reaction used for the formation of phosphatidyl ethanolamine in bacteria?

- Decarboxylation of phosphatidyl serine
- Demethylation of phospatidyl choline
- Reaction of CDP-ethanolamine with CDP-diacylglycerol
- Reaction of ethanolamine with CDP-diacylglycerol

36 of 100

121 PU_102 new_E

Insoinic acid is the biological precursor of:-

- Cytosine and Uric acid
- Adenylic acid and Guanylic acid
- Orotic acid and Uridylic acid
- Adenosine and Thymidine

37 of 100

105 PU_102 new_E

Which of the following is an example for a trisaccharide?

- Raffinose
- Sucralose
- Stachyose
- Verbascose

38 of 100

127 PU_102 new_E

The Cell line used for production of Polio vaccine is:-

- Primate kidney cell line
- Mouse fibroblast cell line
- Dog kidney cell line
- CHO cell line

39 of 100

111 PU_102 new_E

Which of the following cellular event can be best regulated by prostaglandins?

- Synthesis of inter cellular cyclic AMP
- Synthesis of inter cellular cyclic GMP
- Synthesis of intra cellular cyclic AMP
- Synthesis of intra cellular cyclic GMP

40 of 100

151 PU_102 new_E
When s subunit dissociates from an initiated RNA polymerase:-

- it leaves behind an elongating species complexed with Rho factor
- it hydrolyzes ATP until rebound by core enzyme
- it remains bound to the promoter consensus sequence
- it can bind a core enzyme to reform holoenzyme

41 of 100

154 PU_102 new_E
C_0t analysis provides an estimate of the:-

- G + C content of the DNA
- Hyperchromic shift of the genome
- Complexity of the genome
- Tm of the DNA

42 of 100

112 PU_102 new_E
Steroids are oxidized derivatives of sterols. They have -

- Sterol nucleus without CH_3 between 'C' ring and 'D' ring of cholesterol
- Sterol nucleus with two alkyl chain attached to the ring 'D' of cholesterol
- Sterol nucleus with two CH_3 between 'C' and 'D' and 'A' and 'B' rings of cholesterol
- Sterol nucleus but lack the alkyl chain attached to the ring D of cholesterol

43 of 100

133 PU_102 new_E
The ability of the immune system to recognize self versus nonself antigen is an example of:-

- Tolerance
- Specific immunity
- Humoral immunity
- Cell mediated immunity

44 of 100

120 PU_102 new_E
Which of the following events takes place during Diplotene stage of meiosisprophase I?

- Formation of recombinational nodules
- Formation of chiasma
- Compaction of chromosomes
- Dissolution of synaptonemal complex

45 of 100

124 PU_102 new_E
Degeneracy of genetic code indicates presence of:-

- Multiple codons for a given amino acid
- Codons having one or more unusual bases
- Codons having only two bases
- Base triplets not coding for any amino acid

46 of 100

136 PU_102 new_E
Which of the following is supported by the genomic sequence of *Rickettsia prowazekii* ?

- Bacteria have evolved from viruses
- Parasites have definite genomic sequences similar to viruses
- Mitochondria have evolved from endosymbiotic bacteria
- Parasitic bacteria have large genomes

47 of 100

118 PU_102 new_E
Induction of β-galactosidase activity by IPTG is due to:-

- IPTG binding to lac I gene product and inhibiting its activity
- IPTG binding to lac operon and inducing transcription
- Inhibition of -galactosidase degradation
- Stimulation of lac repressor function

48 of 100

130 PU_102 new_E
All of the following diseases are caused by trinucleotide repeat mutations affecting non-coding regions except:-

- Spinocerebellar ataxia
- Friedreich ataxia
- Fragile X syndrome
- Myotonic dystrophy

49 of 100

102 PU_102 new_E
Which of the following enzyme contain Selenocysteine?

- Glutathioneperoxidase
- Catalase
- Nitratereductase
- All of these

50 of 100
123 PU_102 new_E
Another name for reverse transcriptase is:-

- DNA dependent RNA polymerase
- RNA dependent DNA polymerase
- DNA dependent DNA polymerase
- RNA dependent RNA polymerase

51 of 100
109 PU_102 new_E
Which of the following causes deviation in Hardy-Weinberg equilibrium in a population?

- Random mating
- Lack of selection pressure
- Small population size
- Gene frequency

52 of 100
157 PU_102 new_E
Plasmid vectors are ideal for cloning because they:-

- can accommodate inserts of over 100 kilobases
- can generally accommodate larger inserts than phage vectors can
- grow within bacteria, and are present in bacterial colonies on an agar plate
- include centromeres to allow propagation in yeast

53 of 100
159 PU_102 new_E
The total magnification of a microscope is calculated by:-

- Multiplication of the objective lens and condenser lens magnification powers
- Square of objective lens power
- Multiplication of the objective lens and ocular lens magnification powers
- Addition of the objective lens and ocular lens magnification powers

54 of 100
142 PU_102 new_E
The subunits in prokaryotic ribosomes are:-

- 60S+40S
- 60S+30S
- 70S+30S
- 50S+30S

55 of 100
114 PU_102 new_E
The immunoglobulin fold is made up of:-

- A sandwich of two antiparallel beta sheets
- A sandwich of two parallel beta sheets
- Seven alpha helical segments
- A beta barrel

56 of 100
108 PU_102 new_E
For the construction of Ramachandran's plot, values of Psi and Phi are plotted. The value of Phi is the rotation angle around:-

- N H bond
- Cα C bond
- C N bond
- N Cα bond

57 of 100
126 PU_102 new_E
Hybrid antibodies are:-

- Antibodies produced in vitro
- Antibodies produced in rabbit
- Antibodies produced in mouse ascites
- Antibodies designed & produced through rDNA technology

58 of 100
100 PU_102 new_E
Aminolevulinic acid, the first product in porphyrin biosynthesis in eukaryotes is synthesized from ____ and succinyl-CoA.

- Methionine
- Tryptophan
- Glycine
- Valine

59 of 100
106 PU_102 new_E
Chrysolaminarin is:-

- A storage polysaccharide of brown algae
- Astoragepolysaccharideofgreen algae
- A storage polysaccharide of diatoms

- A storage polysaccharide of red algae

60 of 100

117 PU_102 new_E

In humans, XX males and XY females are rare. Such rare sexes are due to:-

- Deletion of XY chromosome
- Duplication of X chromosome
- Deletion of Y chromosome
- XY translocation

61 of 100

221 PU_2016_102_M

Carboxyl group transferring coenzyme is _____.

- Tetrahydrofolate
- Biotin
- Thiamine pyrophosphate
- Pyridoxal phosphate

62 of 100

233 PU_2016_102_M

The mineral portion of animal and human teeth is called as:-

- Cementum
- Hydroxylapaptite
- Stalagmites
- Odontoblasts

63 of 100

236 PU_2016_102_M

Leptin is a mediator of:-

- Increasing food intake
- Long-term regulation of energy balance
- Short -term regulation of energy balance
- Cell transport

64 of 100

220 PU_2016_102_M

Which of the following hormone is necessary for the maintenance of pregnancy?

- Estrogen
- Aldosterone
- β-estradiol

- Progesterone

65 of 100

224 PU_2016_102_M

Which of the following occurs in non-shivering thermogenesis?

- Fatty acids uncouple oxidative phosphorylation
- Glucose is oxidized to lactate
- ATP is burned for heat production
- Ethanol is formed

66 of 100

237 PU_2016_102_M

Roles of sterol regulatory element-binding proteins (SREBPs) have been established for:-

- Only fatty acid synthesis
- Fatty acid transport to blood vessels
- Cholesterol and fatty acid synthesis
- Only cholesterol synthesis

67 of 100

225 PU_2016_102_M

The acceptor of CO_2 in C_3 plant is _____.

- Phosphoenol pyruvate
- Ribulose-1,5-bisphosphate
- 3-phosphoglyceric acid
- Xylose-bisphosphate

68 of 100

229 PU_2016_102_M

How many ATPs will come from the β-oxidation of palmitate? (1 FADH = 1.5 ATP &1 NADH = 2.5 ATP)

- 108
- 109
- 106
- 104

69 of 100

228 PU_2016_102_M

Two sugars which differ from one another only in configuration around a single carbon atom are termed:-

- Anomers
- Optical isomers
- Epimers

- Stereoisomers

70 of 100
232 PU_2016_102_M
Epiboly is a:-

- cell movement that occurs in the early embryo
- Cell burst
- state of the developed foetus
- cell movement that occurs in the late embryo

71 of 100
166 PU_102 new_M
Resrpine, drug is extracted from:-

- Brassica oleraceae
- Digitalis purpurea
- Rauwolfia serpentina
- Atropa belladonna

72 of 100
174 PU_102 new_M
Which of the following protein has least evolutionary rate?

- Insulin
- Lysozyme
- Histone H4
- Hemoglobin

73 of 100
162 PU_102 new_M
Arrhenius defined an acid as:-

- a source of OH^- ions in water
- a source of H^+ ions in water
- a species that can donate a proton
- a species that can accept a proton

74 of 100
170 PU_102 new_M
Retrotransposons differ from other transposons in that:-

- they move via an RNA transcript
- they have lost their ability to move about a genome
- they retain their ability to move within a genome

- they are likely to be the remains of a viral infection

75 of 100

160 PU_102 new_M

In what phase of a typical bacterial growth curve does the cell decay rate exceed the cell multiplication rate?

- Log phase
- Decline phase
- Lag phase
- Stationary phase

76 of 100

172 PU_102 new_M

Glucose is mobilized in muscle following activation of Gas with epinephrine. After withdrawal of epinephrine, glucose mobilization was continued to be observed in an experiment. This could be due to

- absence of protein kinase A
- presence of cAMP phosphodiesterase inhibitor
- low rate of cAMP formation
- presence of cAMp phosphodiesterase activator

77 of 100

164 PU_102 new_M

Gibberella fujikuroi the fungus causes:-

- Rust disease of rice or bakanae disease
- Foolish seedling disease of rice or bakanae disease
- Damping off seedling disease of rice or bakanae disease
- Fungal blight disease of rice or bakanae disease

78 of 100

178 PU_102 new_M

Which of the following gases act as signaling molecules in eukaryotes?

- Ethylene & Nitric Oxide
- Oxygen & Nitric oxide
- Carbon dioxide and ethylene
- Ethylene & Nitrous oxide

79 of 100

176 PU_102 new_M

Meselson-Stahl experiment confirmed:-

- Dispersive replication of DNA
- Non-conservative replication of DNA

- Semi-conservative replication of DNA
- Conservative replication of DNA

80 of 100
168 PU_102 new_M
The genes that malfunction in cancer normally:-
- are responsible for sex determination
- regulates RNA transcription
- code for enzymes that repair damaged DNA
- are not present in most body cells

81 of 100
260 PU_2016_102_D
Graffian follicles are characteristically found in the :-
- Ovary of mammals
- Thyroid of mammals
- Ovary of Frog
- Testis of mammals

82 of 100
276 PU_2016_102_D
Parkinsons's disease is caused by degeneration of brain neurons that are involved in movement control and make use of neurotransmitter:-
- acetylcholine
- GABA
- norepinephrine
- dopamine

83 of 100
268 PU_2016_102_D
For glycogenesis, Glucose should be converted to:-
- Glucuronic acid
- UDP glucose
- Sorbitol
- Pyruvic acid

84 of 100
272 PU_2016_102_D
Tricarboxylic acid cycle to be continuous requires the regeneration of:-
- Pyruvic acid

- oxoglutaric acid
- oxaloacetic acid
- Malic acid

85 of 100

273 PU_2016_102_D

Dehydrogenation of succinic acid to fumaric acid requires the following hydrogen carrier:-

- flavoprotein
- NADP+
- Glutathione
- NAD+

86 of 100

277 PU_2016_102_D

pBINI9:-

- Binary vector with Kanaymcin resistance gene and lac Z gene
- Cointegerate vector with ampicillin resistance gene and lac Z gene
- Binary vector with ampicillin resistance gene and lac Z gene
- Co-integerate vector with Kanaymcin resistance gene and lac Z gene

87 of 100

269 PU_2016_102_D

Fluoride inhibits _____ and arrests glycolysis.

- Glyceraldehyde-3-phosphate dehydrogenase
- Aconitase
- Succinate dehydrogenase
- Enolose

88 of 100

264 PU_2016_102_D

Which of the following would rule out hyperuricemia in a patient?

- Xanthine oxidase hyperactivity
- Carbamoyl phosphate synthase deficiency
- Lesch-Nyhan syndrome
- Gout

89 of 100

261 PU_2016_102_D

Which of the following statements about membrane fluidity is correct?

- Membrane fluidity is decreased when there is a high proportion of *cis* unsaturated fatty acids in the glycerophosphate molecules that make up the bilayer.
- Membrane fluidity is increased when there is a high proportion of *cis* unsaturated fatty acids in the glycerophosphate molecules that make up the bilayer.
- Membrane fluidity is increased when there is a high proportion of *trans* unsaturated fatty acids in the glycerophosphate molecules that make up the bilayer.
- Membrane fluidity is increased when there is a high proportion of saturated fatty acids in the glycerophosphate molecules that make up the bilayer.

90 of 100

265 PU_2016_102_D

Analysis of DNA structure by X-ray diffraction is governed by _____.

- Wilkin's law
- Franklin's law
- Watson-crick law
- Bragg's law

91 of 100

198 PU_102 new_D

Compare the electronic absorption spectra of three iron(II) complexes combined in one plot.You should therefore plot:-

- Absorbance against wavelength
- Extinction coefficient against concentration
- Absorbance against wavenumber
- Extinction coefficient against wavelength

92 of 100

196 PU_102 new_D

Which of the following is incorrect about hepatitis B?

- Carrier state is indicated by positive HBsAg and anti-HBsAg
- Late convalescence is shown by positive anti HBs, anti HBc and anti HBe
- Acute hepatitis stage is represented by HBs Ag and HbcAg
- Later period of incubation is indicated by positive HBsAg and HBcAg

93 of 100

188 PU_102 new_D

CAAT box is present in many

- Eukaryotic promoters downstream of TATA box
- Eukaryotic promoters upstream of TATA box
- Prokaryotic promoters upstream of TATA box

- Prokaryotic promoters downstream of TATA box

94 of 100
190 PU_102 new_D
Ti plasmid used in genetic engineering is obtained from:-

- Bacillus Subtilis
- Bacillus thuringiensis
- Agrobacterium rhizogenes
- Agrobacterium tumifaciens

95 of 100
186 PU_102 new_D
Conversion of a procarcinogen to a carcinogen often requires

- Microsomal hydroxylation
- Exposure to ultraviolet radiation
- Proteolysis
- Exposure to X-rays

96 of 100
194 PU_102 new_D
Nissl's granules are actually:-

- Groups of golgi bodies
- groups of endoplasmic reticulum (ER)
- groups of mitochondria
- groups of ribosomes

97 of 100
182 PU_102 new_D
All the following statements about Wilson's disease are correct except

- Defect involves copper-dependent P-type ATPase
- Copper is deposited in liver, basal ganglia and around cornea
- Plasma copper level is increased
- It is a genetic disease

98 of 100
180 PU_102 new_D
The order of reagents used in Gram's stain are:-

- Crystal violet, Iodine, Saffranine and Alcohol
- Iodine, Alcohol, Crystal violet and Saffranine
- Crystal violet, Iodine, Alcohol and Saffranine

- Crystal violet, Saffranine, Alcohol and Iodine

99 of 100

184 PU_102 new_D
Secretin is made up of -

- 27 amino acids
- 47 amino acids
- 37 amino acids
- 17 amino acids

100 of 100

192 PU_102 new_D
In humans, the placenta is

- Haemochorial
- Endothelial
- Syndesmochorial
- Epitheliochorial