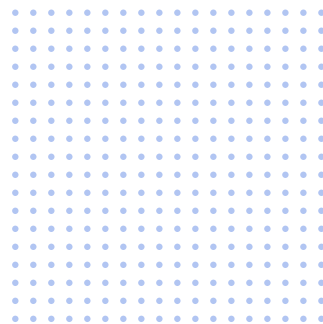




FOR JNU EE EXAM PREPARATION

JNU EE 2022

Question Paper · Ph.D Computational Biology and Bioinformatics - Track 2 Life Sciences

EXAM	YEAR	TYPE
JNU EE	2022	Question Paper

SUBJECT
Ph.D Computational Biology and Bioinformatics - Track 2 Life Sciences



Test Date : 10 Dec 2022

Test Slot : Slot 1

Subject : TRBL-Computational Biology & Bioinformatics Track -2 Life sciences

Sl. No.1

QBID:1102101

Reverse transcriptase catalyzes which of the following reactions?

- 1) Transcription of DNA to RNA
- 2) Translation of RNA to DNA
- 3) Transcription of RNA to DNA
- 4) Conversion of ribonucleotides into deoxyribonucleotides

(1) 1

(2) 2

(3) 3

(4) 4

1[Option ID=17201]

2[Option ID=17202]

3[Option ID=17203]

4[Option ID=17204]

Sl. No.2

QBID:1102102

How does nucleosome formation affect the initiation and/or elongation phases of transcription?

- 1) Via recruiting histone and DNA-modifying enzymes
- 2) Via inducing DNA degradation at the point of contact with histones
- 3) Via inhibiting access of enzymes involved in transcription
- 4) Nucleosomes have no significant effect on transcription

(1) 1

(2) 2

(3) 3

(4) 4

1[Option ID=17205]

2[Option ID=17206]

3[Option ID=17207]

4[Option ID=17208]

Sl. No.3

QBID:1102103

A set of genes clustered together encoding enzymes of a particular metabolic pathway and subjected to coordinated control is termed as?

- 1) Operator
- 2) Operon
- 3) Origin
- 4) Coordinated controller

(1) 1

(2) 2

(3) 3

(4) 4

1[Option ID=17209]

2[Option ID=17210]

3[Option ID=17211]

4[Option ID=17212]

Sl. No.4

QBID:1102104

Which of the following amino acids in histone proteins is typically methylated?

- 1) Arginine
- 2) Lysine
- 3) Histidine
- 4) Asparagine

(1) 1

(2) 2

(3) 3

(4) 4

1[Option ID=17213]

2[Option ID=17214]

3[Option ID=17215]

4[Option ID=17216]

Sl. No.5

QBID:1102105

How enhancers can stimulate the transcription from large distances?

- 1) Enhancers can reversibly excise the intervening DNA between enhancers and promoters
- 2) Enhancers unwind DNA
- 3) Enhancers and core promoters are brought into close proximity through DNA loop formation
- 4) Due to binding of RNA polymerase II to enhancers

(1) 1

(2) 2

(3) 3

(4) 4

1[Option ID=17217]
 2[Option ID=17218]
 3[Option ID=17219]
 4[Option ID=17220]

Sl. No.6
 QBID:1102106

Which of the following is NOT a DNA sequencing method?

- 1) Gene cloning
- 2) Chain termination
- 3) Illumina
- 4) Oxford Nanopore

(1) 1

(2) 2

(3) 3

(4) 4

1[Option ID=17221]
 2[Option ID=17222]
 3[Option ID=17223]
 4[Option ID=17224]

Sl. No.7
 QBID:1102107

The complete set of metabolites present in a particular cell type is termed as?

- 1) Metabolome
- 2) Translatome
- 3) Metabolite collection
- 4) Proteome

(1) 1

(2) 2

(3) 3

(4) 4

1[Option ID=17225]
 2[Option ID=17226]
 3[Option ID=17227]
 4[Option ID=17228]

Sl. No.8
 QBID:1102108

Southern blotting refers to?

- 1) Transfer of RNA from a gel
- 2) Transfer of DNA from a gel
- 3) Translation of protein
- 4) Transfer of protein from a gel

(1) 1

(2) 2

(3) 3

(4) 4

1[Option ID=17229]

2[Option ID=17230]

3[Option ID=17231]

4[Option ID=17232]

Sl. No.9

QBID:1102109

The subcellular site of the breakdown of long-chain fatty acids to acetyl-CoA via beta-oxidation is?

- 1) Matrix of mitochondria
- 2) Endoplasmic reticulum
- 3) Golgi apparatus
- 4) Cytosol

(1) 1

(2) 2

(3) 3

(4) 4

1[Option ID=17233]

2[Option ID=17234]

3[Option ID=17235]

4[Option ID=17236]

Sl. No.10

QBID:1102110

Which of the following is not a reducing sugar?

- 1) Galactose
- 2) Fructose
- 3) Ribose
- 4) Erythrose

(1) 1

(2) 2

(3) 3

(4) 4

1[Option ID=17237]
 2[Option ID=17238]
 3[Option ID=17239]
 4[Option ID=17240]

Sl. No.11
QBID:1102111

A gene with more than one allele is termed as?

- 1) Hybrid
- 2) Heterologous
- 3) Pleiotropic
- 4) Polymorphic

(1) 1

(2) 2

(3) 3

(4) 4

1[Option ID=17241]
 2[Option ID=17242]
 3[Option ID=17243]
 4[Option ID=17244]

Sl. No.12
QBID:1102112

A codominant marker that required polymerase chain reaction and two restriction enzymes?

- 1) RFLP
- 2) AFLP
- 3) EST
- 4) Polymorphic

(1) 1

(2) 2

(3) 3

(4) 4

1[Option ID=17245]
 2[Option ID=17246]
 3[Option ID=17247]
 4[Option ID=17248]

Sl. No.13
QBID:1102113

Which of the following methods is suitable to study protein-DNA interactions?

- 1) Yeast two-hybrid
- 2) Co-immunoprecipitation
- 3) ChIP sequencing
- 4) DNA sequencing

(1) 1

(2) 2

(3) 3

(4) 4

1[Option ID=17249]

2[Option ID=17250]

3[Option ID=17251]

4[Option ID=17252]

Sl. No.14

QBID:1102114

The approximate length of a peptide chain having molecular weight of 22 kDa would be?

- 1) 22 amino acids
- 2) 200 amino acids
- 3) 220 amino acids
- 4) 2200 amino acids

(1) 1

(2) 2

(3) 3

(4) 4

1[Option ID=17253]

2[Option ID=17254]

3[Option ID=17255]

4[Option ID=17256]

Sl. No.15

QBID:1102115

Gene cloning is a method used for?

- 1) Gene mapping
- 2) Gene amplification
- 3) Gene targeting
- 4) Gene interference

(1) 1

(2) 2

(3) 3

(4) 4

1[Option ID=17257]
 2[Option ID=17258]
 3[Option ID=17259]
 4[Option ID=17260]

Sl. No.16
 QBID:1102116

The three-dimensional structure of protein can be determined by?

- 1) Flourescence spectroscopy
- 2) X-ray crystallography
- 3) Both 1 and 2
- 4) Mass Spectroscopy

(1) 1
 (2) 2
 (3) 3
 (4) 4

1[Option ID=17261]
 2[Option ID=17262]
 3[Option ID=17263]
 4[Option ID=17264]

Sl. No.17
 QBID:1102117

Function of beta-mercaptoethanol in SDS-PAGE is?

- 1) To give negative charges to amino acids of protein molecules
- 2) For oxidation of disulfide bonds in proteins
- 3) For reduction of disulfide bonds in proteins
- 4) For breaking hydrogen bonds in proteins

(1) 1
 (2) 2
 (3) 3
 (4) 4

1[Option ID=17265]
 2[Option ID=17266]
 3[Option ID=17267]
 4[Option ID=17268]

Sl. No.18
 QBID:1102118

The natural antisense transcripts are?

- 1) Altered transcripts created due to natural mutations
- 2) Complementary to other RNA transcripts
- 3) Transcripts that can code for more than one protein
- 4) Complementary to only the transcripts of housekeeping genes

(1) 1

(2) 2

(3) 3

(4) 4

1[Option ID=17269]

2[Option ID=17270]

3[Option ID=17271]

4[Option ID=17272]

Sl. No.19

QBID:1102119

Which of the following vectors can carry the longest piece of foreign DNA?

- 1) Bacteriophage
- 2) Cosmids
- 3) Plasmids
- 4) Bacterial artificial chromosome

(1) 1

(2) 2

(3) 3

(4) 4

1[Option ID=17273]

2[Option ID=17274]

3[Option ID=17275]

4[Option ID=17276]

Sl. No.20

QBID:1102120

A halophyte plant can grow better under which of the following conditions?

- 1) High light intensity
- 2) Drought
- 3) High salinity
- 4) Low wavelength light

(1) 1

(2) 2

(3) 3

(4) 4

1[Option ID=17277]
 2[Option ID=17278]
 3[Option ID=17279]
 4[Option ID=17280]

Sl. No.21
QBID:1102121

Active chromatin is strongly characterized by which of the following histone modifications?

- 1) H3K4 acetylation
- 2) H3K9 trimethylation
- 3) H4S1 phosphorylation
- 4) H3K9 dimethylation

- (1) 1
 (2) 2
 (3) 3
 (4) 4

1[Option ID=17281]
 2[Option ID=17282]
 3[Option ID=17283]
 4[Option ID=17284]

Sl. No.22
QBID:1102122

Cluster analysis in DNA microarray experiment refers to?

- 1) Genes that are clustered together in the genome
- 2) Cluster of probes that are used to monitor gene expression
- 3) Genes that are likely to work in concert in the cell
- 4) Cluster of cDNAs printed on microarray chip

- (1) 1
 (2) 2
 (3) 3
 (4) 4

1[Option ID=17285]
 2[Option ID=17286]
 3[Option ID=17287]
 4[Option ID=17288]

Sl. No.23
QBID:1102123

A mutation in the codon UCG to UAG is described as?

- 1) Missense mutation
- 2) Non-synonymous mutation
- 3) Silent mutation
- 4) Nonsense mutation

(1) 1

(2) 2

(3) 3

(4) 4

1[Option ID=17289]

2[Option ID=17290]

3[Option ID=17291]

4[Option ID=17292]

Sl. No.24

QBID:1102124

Apomictically produced off springs are?

- 1) Genetically better than the parent plant
- 2) Genetically different from the parent plant
- 3) Genetically worse than the parent plant
- 4) Genetically identical to the parent plant

(1) 1

(2) 2

(3) 3

(4) 4

1[Option ID=17293]

2[Option ID=17294]

3[Option ID=17295]

4[Option ID=17296]

Sl. No.25

QBID:1102125

The colonies of recombinant bacteria appear white in contrast to blue colonies of non-recombinant bacteria because of

- 1) Inactivation of glycosidase in recombinant bacteria
- 2) Recombinant bacteria containing beta-galactosidase
- 3) Insertional inactivation of beta-galactosidase in recombinant bacteria
- 4) Insertional inactivation of alpha-galactosidase in non-recombinant bacteria

(1) 1

(2) 2

(3) 3

(4) 4

1[Option ID=17297]
 2[Option ID=17298]
 3[Option ID=17299]
 4[Option ID=17300]

Sl. No.26
 QBID:1102126

Which of the following is most correct group of components found in DNA

- 1) Phosphate group, adenine, and ribose
- 2) Phosphate group, guanine, and deoxyribose
- 3) Cytosine and ribose
- 4) Uracil and deoxyribose

(1) 1

(2) 2

(3) 3

(4) 4

1[Option ID=17301]
 2[Option ID=17302]
 3[Option ID=17303]
 4[Option ID=17304]

Sl. No.27
 QBID:1102127

Read the following statements carefully.

- A. The plants cells contain the outer covering called cell wall.
- B. The animal cells contain the outer covering called cell wall.
- C. Most of the eukaryotic cells are microscopic and thus are visible with naked eyes.

Choose the correct answer from the options given below:

- 1) A is incorrect
- 2) A and B both are incorrect
- 3) B and C both are incorrect
- 4) A, B and C all are incorrect

(1) 1

(2) 2

(3) 3

(4) 4

1[Option ID=17305]
 2[Option ID=17306]
 3[Option ID=17307]
 4[Option ID=17308]

Sl. No.28
 QBID:1102128

Which of the following combinations represent approximate number of base pairs of DNA _____ which is there into _____ chromosomes in a typical diploid human cell in a nonreplicating state?

- 1) 64 billion; 23
- 2) 6.4 trillion; 46
- 3) 6.4 billion; 46
- 4) 64 billion; 46

(1) 1

(2) 2

(3) 3

(4) 4

1[Option ID=17309]

2[Option ID=17310]

3[Option ID=17311]

4[Option ID=17312]

Sl. No.29

QBID:1102129

During replication of DNA, what does DNA primase synthesise?

- 1) RNA primer
- 2) DNA primer
- 3) Okazaki fragments
- 4) Leading strand

(1) 1

(2) 2

(3) 3

(4) 4

1[Option ID=17313]

2[Option ID=17314]

3[Option ID=17315]

4[Option ID=17316]

Sl. No.30

QBID:1102130

What is the name of the enzyme which synthesises RNA from a double stranded DNA template?

- 1) DNA-dependent DNA polymerase
- 2) DNA-dependent RNA polymerase
- 3) RNA-dependent RNA polymerase
- 4) DNA-dependent RNA convertase

(1) 1

(2) 2

(3) 3

(4) 4

1[Option ID=17317]

2[Option ID=17318]

3[Option ID=17319]

4[Option ID=17320]

Sl. No.31**QBID:1102131**

Identify the amino acid that is main contributor to the transport of nitrogen destined for its excretion as urea:

- 1) Alanine
- 2) Glutamine
- 3) Ornithine
- 4) Lysine

(1) 1

(2) 2

(3) 3

(4) 4

1[Option ID=17321]

2[Option ID=17322]

3[Option ID=17323]

4[Option ID=17324]

Sl. No.32**QBID:1102132**

Select one of the following statements regarding the immunoglobulins that is NOT correct:

- 1) Immunoglobulins are glycosylated
- 2) All immunoglobulins contain at least two heavy chain and two light chain polypeptides
- 3) The immunoglobulin polypeptide chains are linked together by disulphide bonds
- 4) Immunoglobulins are the primary components of the body's innate immune system

(1) 1

(2) 2

(3) 3

(4) 4

1[Option ID=17325]

2[Option ID=17326]

3[Option ID=17327]

4[Option ID=17328]

Sl. No.33
QBID:1102133

Which of the following immunoglobulins is most abundant?

- 1) IgA
- 2) IgG
- 3) IgM
- 4) IgD

- (1) 1
(2) 2
(3) 3
(4) 4

1[Option ID=17329]
2[Option ID=17330]
3[Option ID=17331]
4[Option ID=17332]

Sl. No.34
QBID:1102134

Which of the following represents a form of bacterial adaptive immune system?

- 1) Clustered regulatory interspaced short palindromic repeats related gene 9
- 2) Cluttered regulatory interspecies short palindromic region assorted gene 9
- 3) Cluttered regulatory interspaced short palindromic repeats associated gene 9
- 4) Clustered regulatory interspersed short palindromic repeats associated gene 9

- (1) 1
(2) 2
(3) 3
(4) 4

1[Option ID=17333]
2[Option ID=17334]
3[Option ID=17335]
4[Option ID=17336]

Sl. No.35
QBID:1102135

Which of the following features of eukaryotic mRNA contribute importantly to maintain half-life?

- 1) 5' UTR sequences
- 2) 3'UTR and Poly(A) tail
- 3) Promotor
- 4) Operator

- (1) 1

(2) 2

(3) 3

(4) 4

1[Option ID=17337]

2[Option ID=17338]

3[Option ID=17339]

4[Option ID=17340]

Sl. No.36

QBID:1102136

Which of the following regulates transpiration process by controlling the opening of stomata under stress condition in dicot plants?

1) Absciscic acid (ABA)

2) Auxin (IAA)

3) Jasmonic acid (JA)

4) Salicylic acid (SA)

(1) 1

(2) 2

(3) 3

(4) 4

1[Option ID=17341]

2[Option ID=17342]

3[Option ID=17343]

4[Option ID=17344]

Sl. No.37

QBID:1102137

Mutation in *PIN1* gene leads to formation of elongated pin-like shoot in *Arabidopsis* without leaves. Application of which of the following hormone (in a piece of gel) on the flank of pin-formed shoot can induce leaf formation?

1) Absciscic acid (ABA)

2) auxin (IAA)

3) cytokinin (CK)

4) IAA and CK

(1) 1

(2) 2

(3) 3

(4) 4

1[Option ID=17345]

2[Option ID=17346]

3[Option ID=17347]

4[Option ID=17348]

Sl. No.38

QBID:1102138

Given below are two statements about the mitochondrial genome.

Statement-I: Mutations in the mitochondrial genome accumulate over the life of the organism

Statement-II: Mutation in some mitochondrial genes that encodes for the components of respiratory chain, e. g. ATP-synthase, can cause human diseases.

In the light of the above statements, choose the most appropriate answer from the options given below:

- 1) Both Statement I and Statement II are correct
- 2) Both Statement I and Statement II are incorrect
- 3) Statement I is correct but Statement II is incorrect
- 4) Statement I is incorrect but Statement II is correct

(1) 1

(2) 2

(3) 3

(4) 4

1[Option ID=17349]

2[Option ID=17350]

3[Option ID=17351]

4[Option ID=17352]

Sl. No.39

QBID:1102139

Given below are two statements about the enhancer element.

Statement-I: An enhancer element must show the binding of RNA-polymerase

Statement-II: An enhancer element functions when located in the upstream or downstream of a transcription site

In the light of the above statements, choose the most appropriate answer from the options given below:

- 1) Both Statement I and Statement II are correct
- 2) Both Statement I and Statement II are incorrect
- 3) Statement I is correct but Statement II is incorrect
- 4) Statement I is incorrect but Statement II is correct

(1) 1

(2) 2

(3) 3

(4) 4

1[Option ID=17353]

2[Option ID=17354]

3[Option ID=17355]
4[Option ID=17356]

Sl. No.40
QBID:1102140

Which of the following is incorrect about glycolysis?

- 1) One molecule of glucose is converted into two molecules of pyruvates
- 2) Glycolytic enzymes are located in the mitochondria
- 3) Energy produced in the oxidation reaction is conserved in the form of NADPH and ATP
- 4) It is also known as EMP pathway

(1) 1

(2) 2

(3) 3

(4) 4

1[Option ID=17357]
2[Option ID=17358]
3[Option ID=17359]
4[Option ID=17360]