

National Testing Agency

Question Paper Name :	Biomolecules Structure Function in Health and Disease 29th Sep 2020 Shift 2
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Biomolecules Structure Function in Health and Disease

Group Number :	1
Group Id :	899514137
Group Maximum Duration :	0
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Show Attended Group? :	No
Edit Attended Group? :	No
Break time :	0
Group Marks :	100
Is this Group for Examiner? :	No

Biomolecules Structure Function in Health and Disease-A

Section Id :	899514185
Section Number :	1
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	20

Number of Questions to be attempted : 20
Section Marks : 20
Mark As Answered Required? : Yes
Sub-Section Number : 1
Sub-Section Id : 899514226
Question Shuffling Allowed : Yes

Question Number : 1 Question Id : 89951411716 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No
Correct Marks : 1 Wrong Marks : 0

pH of a 0.01M NaOH solution is:

1. 3
2. 11
3. 10
4. 12

Options :

89951445803. 1
89951445804. 2
89951445805. 3
89951445806. 4

Question Number : 2 Question Id : 89951411717 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No
Correct Marks : 1 Wrong Marks : 0

The wavelength range used in UV absorption spectroscopy is:

1. 0.8 - 500 μ m
2. 100 - 380nm
3. 380 - 750nm
4. 0.01 - 10nm

Options :

89951445807. 1
89951445808. 2
89951445809. 3
89951445810. 4

Question Number : 3 Question Id : 89951411718 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

On Comparison of energies associated with intra-molecular and inter-molecular interactions, the right order from low to high is

1. Dipole-dipole, hydrogen, metallic, ionic
2. London dispersion, ion-induced dipole, ion-dipole, dipole-dipole
3. Hydrogen, covalent, ionic, metallic
4. Vander Waals, hydrogen, ionic, ion-dipole

Options :

- 89951445811. 1
- 89951445812. 2
- 89951445813. 3
- 89951445814. 4

Question Number : 4 Question Id : 89951411719 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Non-essential amino acids are:

1. Threonine, isoleucine, leucine
2. Aspartic acid, glutamic acid, alanine
3. Methionine, valine, histidine
4. Lysine, valine, histidine

Options :

- 89951445815. 1
- 89951445816. 2
- 89951445817. 3
- 89951445818. 4

Question Number : 5 Question Id : 89951411720 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

High content of triglyceride is present in:

1. Chylomicrons
2. LDL
3. HDL
4. VLDL

Options :

89951445819. 1
89951445820. 2
89951445821. 3
89951445822. 4

Question Number : 6 Question Id : 89951411721 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

The physiological blood pH in humans is in the range :

1. 6.0-6.50
2. 6.8-7.0
3. 7.4-7.5
4. 7.8-8.0

Options :

89951445823. 1
89951445824. 2
89951445825. 3
89951445826. 4

Question Number : 7 Question Id : 89951411722 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Amino acids in proteins exist in-Cis or Trans configuration? But, the amino acid that can exist in both Cis and Trans configuration is :

1. Glycine
2. Alanine
3. Valine
4. Proline

Options :

89951445827. 1
89951445828. 2
89951445829. 3
89951445830. 4

Question Number : 8 Question Id : 89951411723 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Which of the following techniques would be most useful to determine the structure of a protein?

1. NMR spectroscopy
2. Two dimensional gel electrophoresis
3. Infra red spectroscopy
4. HPLC

Options :

- 89951445831. 1
- 89951445832. 2
- 89951445833. 3
- 89951445834. 4

Question Number : 9 Question Id : 89951411724 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Iso-electric focusing of proteins is done on the basis of the property:

1. Molecular weight
2. Aromatic residues
3. pI
4. Cysteine residues

Options :

- 89951445835. 1
- 89951445836. 2
- 89951445837. 3
- 89951445838. 4

Question Number : 10 Question Id : 89951411725 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

RNA that is synthetic and is NOT present naturally in the cell

1. mRNA
2. rRNA
3. miRNA
4. siRNA

Options :

- 89951445839. 1

89951445840. 2

89951445841. 3

89951445842. 4

Question Number : 11 Question Id : 89951411726 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The technique of “foot printing ” is used to study:

1. DNA/RNA expression
2. Protein expression
3. DNA-Protein complex
4. DNA-RNA complexes

Options :

89951445843. 1

89951445844. 2

89951445845. 3

89951445846. 4

Question Number : 12 Question Id : 89951411727 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

RNA can exist in the Ribozyme that are catalytically active because

1. RNA can exist in folded structure
2. RNA can exist in polymeric form
3. RNA are flexible in nature
4. RNA can exist in oligomer

Options :

89951445847. 1

89951445848. 2

89951445849. 3

89951445850. 4

Question Number : 13 Question Id : 89951411728 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Rotation on peptide bond in proteins is

1. Energetically highly favorable and rotation happens all the time.
2. Energetically not favorable and rotation happens all the time.
3. Energetically highly favorable and rotation is not possible.
4. Energetically not favorable and rotation happens sometimes.

Options :

- 89951445851. 1
- 89951445852. 2
- 89951445853. 3
- 89951445854. 4

Question Number : 14 Question Id : 89951411729 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Polymerase Chain Reaction in a thermocycler occur due to the presence of

1. Template DNA, primers, dNTPs, magnesium ions and Taq polymerase
2. Template DNA, dNTPs,
3. RNA
4. Template DNA, primers, dNTPs, and magnesium ions

Options :

- 89951445855. 1
- 89951445856. 2
- 89951445857. 3
- 89951445858. 4

Question Number : 15 Question Id : 89951411730 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The largest energy reserve (in terms of energy in calories) in humans is :

1. Liver glycogen
2. Muscle glycogen
3. Adipose Tissue triacylglycerol
4. Blood glucose

Options :

- 89951445859. 1
- 89951445860. 2
- 89951445861. 3

89951445862. 4

Question Number : 16 Question Id : 89951411731 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Which of the following is correct in reference to 'Sanger sequencing' method

1. Utilization of chemicals for base specific cleavage
2. Deoxy NTPs utilization for chain termination
3. Di-deoxy NTPs Utilization for chain termination
4. Use of ^{32}P for chain termination

Options :

- 89951445863. 1
- 89951445864. 2
- 89951445865. 3
- 89951445866. 4

Question Number : 17 Question Id : 89951411732 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Which of the following enzyme is used to cleave DNA molecules at a specific site

1. Ligase
2. Phosphatase
3. Restriction enzymes
4. Ribonuclease

Options :

- 89951445867. 1
- 89951445868. 2
- 89951445869. 3
- 89951445870. 4

Question Number : 18 Question Id : 89951411733 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

On deamination one of the following bases is converted to uracil

1. Thymine
2. Cytosine
3. Adenine
4. Guanine

Options :

89951445871. 1
89951445872. 2
89951445873. 3
89951445874. 4

Question Number : 19 Question Id : 89951411734 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Enzyme-linked immunosorbent assay (ELISA) is utilized to screen and quantification of:

1. Carbohydrate
2. DNA
3. Antigen
4. RNA

Options :

89951445875. 1
89951445876. 2
89951445877. 3
89951445878. 4

Question Number : 20 Question Id : 89951411735 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Absorption peak at wavelength of 220 nm in a protein comes from:

1. Peptide bonds
2. Disulphide bonds
3. Aromatic amino acids
4. Hydrophobic amino acids

Options :

89951445879. 1
89951445880. 2

89951445881. 3

89951445882. 4

Biomolecules Structure Function in Health and Disease-B

Section Id :	899514186
Section Number :	2
Section type :	Offline
Mandatory or Optional :	Mandatory
Number of Questions :	7
Number of Questions to be attempted :	5
Section Marks :	30
Mark As Answered Required? :	Yes
Sub-Section Number :	1
Sub-Section Id :	899514227
Question Shuffling Allowed :	No

Question Number : 21 Question Id : 89951411736 Question Type : SUBJECTIVE

Correct Marks : 6

What do you understand by hyperchromicity of DNA? Suggest an experiment by which you can prove the theoretical explanation.

Question Number : 22 Question Id : 89951411737 Question Type : SUBJECTIVE

Correct Marks : 6

How can the DNA base sequence information be used to predict the protein? Explain briefly with some any example of your own.

Question Number : 23 Question Id : 89951411738 Question Type : SUBJECTIVE

Correct Marks : 6

Explain, how two dimensional gel electrophoresis (2DE) is better than conventional Sodium dodecyl sulphate Polyacrylamide gel electrophoresis (SDS-PAGE) in analyzing a mixture of proteins?

Question Number : 24 Question Id : 89951411739 Question Type : SUBJECTIVE
Correct Marks : 6

Write briefly on different types of Protein denaturation.

Question Number : 25 Question Id : 89951411740 Question Type : SUBJECTIVE
Correct Marks : 6

Some small molecules/ drugs and their mode of action on DNA are given below.
Match them appropriately

- | | |
|----------------------|--------------------------------|
| 1. Adriamycin | A) Intrastrand DNA adducts |
| 2. 6 Mercapto purine | B) Topoisomerase breaks in DNA |
| 3. Cisplatin | C) Inhibits IMP to AMP |
| 4. Actinomycin -D | D) Intercalation in DNA |
| 5 DAPI or Hoechst | E) DNA major groove binding |
| 6 Methyl green | F) DNA minor groove binding |

Question Number : 26 Question Id : 89951411741 Question Type : SUBJECTIVE
Correct Marks : 6

State the properties of fatty acids which enhance their fluidity of the cell membrane.

Question Number : 27 Question Id : 89951411742 Question Type : SUBJECTIVE
Correct Marks : 6

What are liposomes? Explain briefly their applications in biology.

Section Id :	899514187
Section Number :	3
Section type :	Offline
Mandatory or Optional :	Mandatory
Number of Questions :	7
Number of Questions to be attempted :	5
Section Marks :	50
Mark As Answered Required? :	Yes
Sub-Section Number :	1
Sub-Section Id :	899514228
Question Shuffling Allowed :	No

Question Number : 28 Question Id : 89951411743 Question Type : SUBJECTIVE

Correct Marks : 10

What is the functional difference between myoglobin and haemoglobin? Write briefly on the biochemical basis of Sickle cell anemia.

Question Number : 29 Question Id : 89951411744 Question Type : SUBJECTIVE

Correct Marks : 10

What do you understand by “epigenetics”? What are the methods used to study epigenetics? And how is it used in medicine, Discuss with examples?

Question Number : 30 Question Id : 89951411745 Question Type : SUBJECTIVE

Correct Marks : 10

Discuss the role of cholesterol in physiological function. How can it have adverse effects on health?

Question Number : 31 Question Id : 89951411746 Question Type : SUBJECTIVE

Correct Marks : 10

What does “Ramachandran Plot” represent? Show graphically how is it useful? If D-amino acids were present in the protein what would be its conformation?

Question Number : 32 Question Id : 89951411747 Question Type : SUBJECTIVE
Correct Marks : 10

Write briefly about the muscle proteins and their role in muscle contraction

Question Number : 33 Question Id : 89951411748 Question Type : SUBJECTIVE
Correct Marks : 10

What do you understand by "Proteomics"? Name different applications of proteomics in biology. Explain with a suitable example how is it useful in medicine?

Question Number : 34 Question Id : 89951411749 Question Type : SUBJECTIVE
Correct Marks : 10

What are glycoproteins and proteoglycans? Give examples and show their linkages. Briefly explain the functions of glycoproteins with the help of examples. What is the biochemical basis of Icell disease?