

## Instructions

Read the instructions provided for every question properly before attempting the answer.

### Section - 1 :

contain(s)

**10**

question(s) and each question carries

**2.5**

mark(s).

### Section - 2 :

contain(s)

**10**

question(s) and each question carries

**2.5**

mark(s).

### Section - 3 :

contain(s)

**10**

question(s) and each question carries

**2.5**

mark(s).

### Section - 4 :

contain(s)

**10**

question(s) and each question carries

**2.5**

mark(s).

Click

**Finish**

only after completion of the Exam.

## 1. Section - 1

2.5 marks per question

10 display questions

10 maximum answerable

Q1 MCQ - Single Answer 2.5 marks **CO1**

Prokaryotic cells do not have a nucleus. What do they have in its place?

- Nucleus
- Nucleoid region
- DNA
- Chromatin

Rubrics

Q2 MCQ - Single Answer 2.5 marks **CO1**

Who proposed the cell theory

- Singer and NicholSEN
- Schwann and Schleiden
- Robertson

Q3 MCQ - Single Answer 2.5 marks CO1

In mitochondria, it contains F-particles

- Cristae
- Outer layer
- Matrix
- All of the above

Rubrics

Q4 MCQ - Single Answer 2.5 marks CO1

In a Golgi complex the structure which is the functional unit is

- Cisternae
- Thylakoid
- Archoplasm
- Cristae

Rubrics

Q5 MCQ - Single Answer 2.5 marks CO2

In human, which cell lacks nucleus

- Lymphocyte
- RBC
- Monocytes
- Neutrophils

Rubrics

Q6 MCQ - Single Answer 2.5 marks CO2

Which of the following statements is NOT true for plasma membrane

- It is present in both plant and animal cell
- Lipid is present as a bilayer in it
- roteins are present as integrated as well as loosely associated with the lipid bilayer
- Carbohydrate is never found in it

Rubrics

Q7 MCQ - Single Answer 2.5 marks CO2

Prokaryote is characterized by

- Dispersed DNA and lack of membrane bound organelles
- Absence of nuclear envelope
- Absence of nucleolus
- All of the above

Rubrics

Q8 MCQ - Single Answer 2.5 marks CO1

Carbohydrates present in the plasmalemma are in the form of

- Cellulose
- Hemicellulose
- Starch
- Glycolipids and Glycoproteins

Rubrics

Q9 MCQ - Single Answer 2.5 marks CO2

Select one which is NOT true for ribosome

- Made up of two units
- form polysome
- may attach to mRNA
- Have no role in protein synthesis

Rubrics

Q10 MCQ - Single Answer 2.5 marks CO2

Digestive enzymes are present in

- Lysosome
- Liposome
- Mitochondria
- Ribosome

Rubrics

Q11 MCQ - Multiple Answers 2.5 marks CO2

Which of the following statements are true about Eukaryotes?

- They are cells with a nucleus.
- They are found both in humans and multicellular organisms
- The endoplasmic reticulum is present in Eukaryotes.

Q12

MCQ - Single Answer

2.5 marks

CO2

Cristae are associated with?

- Mitochondria
- Ribosome
- Golgi apparatus
- Ribosome

Rubrics

Q13

MCQ - Single Answer

2.5 marks

CO2

Bulk transport of large quantities of materials into cell is referred as

- Active transport
- Diffusion
- Passive transport
- Endocytosis

Rubrics

Q14

MCQ - Single Answer

2.5 marks

CO2

The plasma membrane consists mainly of

- Proteins embedded in a carbohydrate bilayer
- Phospholipids embedded in a protein bilayer
- Proteins embedded in a phospholipid bilayer
- Proteins embedded in a polymer of glucose molecules

Rubrics

Q15

MCQ - Single Answer

2.5 marks

CO2

Q16

MCQ - Single Answer

2.5 marks

CO1

The number of nuclear pores depends on

- Size of the cell
- Transcriptional activity of the cell
- DNA content of the cell
- All of the above

Rubrics

Q17

MCQ - Single Answer

2.5 marks

CO2

When a ripe tomato is pricked with a needle a watery fluid comes out. This fluid is stored in

- Vacuole
- Plastid
- Cytoplasm
- Nucleus

Rubrics

Q18

MCQ - Single Answer

2.5 marks

CO2

Keeping in view the 'fluid mosaic model' for the structure of cell membrane, which one of the following statement is correct with respect to the movements of lipids and proteins from one lipid monolayer to the other (described as flipflop movement)?

- while proteins can flip-flop, lipids can not
- neither lipids, nor proteins can flip-flop
- both lipids and proteins can flip-flop
- while lipids can rarely flip-flop

Rubrics

Q19

MCQ - Single Answer

2.5 marks

CO2

What is the function of the carbohydrates in the cell membrane?

- Pumps and channels
- cell communication
- cell strength
- Break down organalles

Rubrics

Q20

MCQ - Single Answer

2.5 marks

CO2

Ribosomal RNA is actively synthesized in

- Nucleoplasm
- Ribosome
- Lysosome
- Nucleolus

Q21

MCQ - Single Answer

2.5 marks

CO2

Name an Organelle that serves as a primary packaging area for molecules that will be distributed throughout the cell?

- Mitochondria
- Plastid
- Golgi apparatus
- Vacuole

Rubrics

2. Section - 2

2.5 marks per question

10 display questions

10 maximum answerable

Q1

MCQ - Single Answer

2.5 marks

CO2

The "lock and key" model of enzyme action illustrates that a particular enzyme molecule

- May be destroyed and resynthesised several times
- Interacts with a specific type of substrate molecule
- Reacts at identical rates under all conditions
- Forms a permanent enzyme-substrate complex

Rubrics

Q2

MCQ - Single Answer

2.5 marks

CO2

According to Chargaff's rule, in a DNA molecule

- The amount of adenine and thymine is equal to the amount of guanine and cytosine
- The amount of adenine and guanine is equal to the amount of thymine and cytosine
- The amount of adenine and uracil is equal to the amount of guanine and cytosine
- The amount of adenine and guanine is equal to the amount of uracil and cytosine

Rubrics

Q3

MCQ - Single Answer

2.5 marks

CO2

Nucleic acids are formed of

- Nucleotides
- Nucleosides

**Q4** MCQ - Single Answer 2.5 marks CO2

Purine found in RNA is

- Cytosine
- Guanine
- Uracil
- Thymine

Rubrics

**Q5** MCQ - Single Answer 2.5 marks CO2

The sugar molecule present in nucleotide is

- Triose
- Tetrose
- Pentose
- Hexose

Rubrics

**Q6** MCQ - Single Answer 2.5 marks CO2

Which is the most abundant biomolecule on earth?

- Protein
- Carbohydrate
- Nucleic acid
- Lipids

Rubrics

**Q7** MCQ - Single Answer 2.5 marks CO3

ATP is a

- Nucleoside
- Nucleotide
- Vitamin
- Nucleic acid

Rubrics

Q8

MCQ - Single Answer

2.5 marks

CO3

A phosphodiester bond is present in

- Nucleic acids in a nucleotide
- Monosaccharides in a polysaccharide
- Amino acids in a polypeptide
- Fatty acids in a diglyceride

Rubrics

Q9

MCQ - Single Answer

2.5 marks

CO3

Enzymes have a 3-D shape due to which type of protein structure?

- Primary
- Secondary
- Tertiary
- Quaternary

Rubrics

Q10

MCQ - Single Answer

2.5 marks

CO3

Benefits of enzyme immobilization is

- Cost effective
- Smaller reactor
- Shorter process time
- All of the above

Rubrics

Q11

MCQ - Single Answer

2.5 marks

CO3

DNA is responsible for

- Mitosis of the cell
- Characteristics of the cell
- Location of the cell
- Life of the cell

Rubrics

Q12

MCQ - Single Answer

2.5 marks

CO3



Which of the following is a polysaccharide

- Glucose
- Maltose
- Glycogen

Q13

MCQ - Single Answer

2.5 marks

CO3

In which of the following an anticodon occurs

- tRNA
- mRNA
- DNA
- None of the above

Rubrics

Q14

undefined

2.5 marks

CO3

The process of formation of RNA from DNA is known as

Rubrics

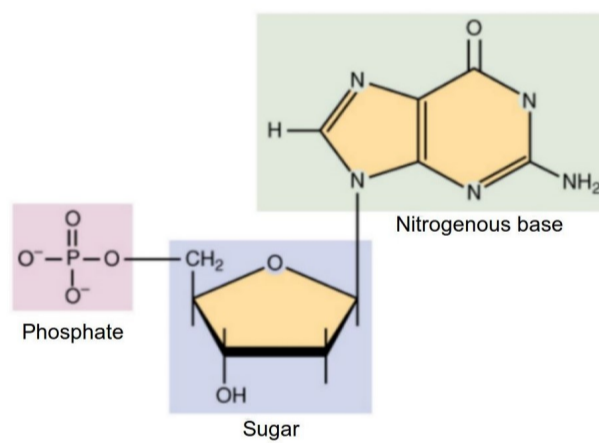
Q15

MCQ - Single Answer

2.5 marks

CO3

Identify the structure shown below



- Nucleoside
- Nucleotide
- DNA
- RNA

Rubrics

Q16

undefined

2.5 marks

CO3

The full form of BLAST is

Rubrics

Q17

MCQ - Single Answer

2.5 marks

CO3

When hundreds or thousands of monosaccharides condense together, it will form polysaccharides. These are not sweet in taste hence they are called non-sugars.

- TRUE
- FALSE

**Q18** MCQ - Single Answer 2.5 marks CO3

Both DNA and RNA can form double helices.

- TRUE
- FALSE

Rubrics

**Q19** MCQ - Single Answer 2.5 marks CO2

Like replication, transcription also occurs bidirectionally.

- TRUE
- FALSE

Rubrics

**Q20** MCQ - Single Answer 2.5 marks CO2

Which is an organic compound found in most cells?

- Glucose
- Water
- NaCl
- O<sub>2</sub>

Rubrics

**3. Section - 3**

2.5 marks per question

10 display questions

10 maximum answerable

**Q1** MCQ - Single Answer 2.5 marks CO3

All are nucleotide database except

- Swiss-Prot
- GenBank
- EMBL
- DDBJ

Rubrics

**Q2** MCQ - Single Answer 2.5 marks CO3

which of the following compares protein sequence against protein databases.

- blastp
- blastn
- blastx
- tblastx

**Q3** MCQ - Single Answer 2.5 marks CO3

The databases Genbank, EMBL and DDBJ are updated daily.

- TRUE
- FALSE

Rubrics

**Q4** MCQ - Single Answer 2.5 marks CO3

PubMed is one of the popular resources of

- NCBI
- EMBL
- DDBJ
- SWISS-PROT

Rubrics

**Q5** MCQ - Single Answer 2.5 marks CO3

Identify the amino acid sequence

- TACCGGCTATCG
- UACCGGCUAUCG
- IKKPSGEQCD
- All of the above

Rubrics

**Q6** MCQ - Single Answer 2.5 marks CO3

When performing a database search, what is the definition of an E-value?

- The chance that a random sequence could achieve a better score than the query
- The number of hits one can "expect" to see by chance when searching a database of a particular size.
- The chance that a random sequence could achieve a worse score than the query.
- The chance that a homologous sequence could achieve a better score than the query.

Rubrics

**Q7** MCQ - Single Answer 2.5 marks CO3

TRUE

FALSE

Rubrics

Q8 undefined 2.5 marks CO3

The full form of NCBI is

Rubrics

Q9 MCQ - Single Answer 2.5 marks CO3

Which of the following is incorrect about ENTREZ?

It is a resource prepared only by the staff of the National Center for Biotechnology Information

It provides a series of forms that can be filled out to retrieve a Medline reference related to the molecular biology sequence databases

One straightforward way to access the sequence databases is through ENTREZ

It provides a series of forms that can be filled out to retrieve a DNA or protein sequence

Rubrics

Q10 MCQ - Single Answer 2.5 marks CO3

The initiation of FASTA format has the following symbol.

<

>

/

}

Rubrics

Q11 MCQ - Single Answer 2.5 marks CO3

Which of the following is a protein structural database

GenBank

Swiss-Prot

DDBJ

PDB

Rubrics

Q12 MCQ - Single Answer 2.5 marks CO3

Entrez, a life science search engine used to search across databases is maintained by

- Swiss-Prot
- EMBL
- DDBJ
- NCBI

**Q13** MCQ - Single Answer 2.5 marks CO3

In BLAST, similarity matching of words is involved. If no words are found similar, then no alignment is detected and hence it might not find matches for very short sequences.

- TRUE
- FALSE

Rubrics

**Q14** MCQ - Single Answer 2.5 marks CO3

Genbank is maintained by

- EBI
- NIG
- NCBI
- None of the above

Rubrics

**Q15** MCQ - Single Answer 2.5 marks CO3

Which of the following is a protein viewing software

- BLAST
- CLUSTALW
- CLUSTALX
- RASMOL

Rubrics

**Q16** MCQ - Single Answer 2.5 marks CO3

Which one of the following is a bibliographic database

- PubMed
- Entrez
- PIR
- EBI

Rubrics

**Q17** MCQ - Single Answer 2.5 marks CO3

Which of the following is not a variant of BLAST?

- BLASTn
- BLASTp
- BLASTx
- tBLASTnx

Rubrics

Q18

MCQ - Single Answer

2.5 marks

CO3

Genbank at the NCBI is located at

- Mishima, Japan
- Hixton, England
- Washington DC
- None of the above

Rubrics

Q19

MCQ - Single Answer

2.5 marks

CO3

Which of the following is a primary database

- DDBJ
- EMBL
- GenBank
- All of the above

Rubrics

Q20

MCQ - Single Answer

2.5 marks

CO3

Which one of the following is not a sequencing database

- NCBI
- DDBJ
- EMBL
- PDB

Rubrics

4. Section - 4

2.5 marks per question

10 display questions

10 maximum answerable

Q1

MCQ - Single Answer

2.5 marks

CO4

TDI IC

Q2 MCQ - Single Answer 2.5 marks CO4

The bonds involved in antigen-antibody interactions are

- Weak hydrogen bonds and vanderwalls forces
- Strong covalent bonds
- Strong di-sulphide bonds
- All of the above

Rubrics

Q3 MCQ - Single Answer 2.5 marks CO4

Identify the correct statement about actuators, a component of bioMEMS device

- An actuator is a device that converts an electrical signal into an action
- Actuator can create a force to manipulate itself, other mechanical devices, or the surrounding environment to perform some useful function.
- both (a) and (b)
- None of the above

Rubrics

Q4 MCQ - Single Answer 2.5 marks CO4

Which food has been altered the most by biotechnology today?

- Corn
- Potato
- Beef
- Chicken

Rubrics

Q5

MCQ - Single Answer

2.5 marks

CO4

Which of the following statements is true about the ethics of creating/designing living organisms?

- We should consider the ethical concerns when we create any living organism
- We do not need to consider any ethical issues when we create living organisms.
- We should never create a living organism even if we have the technology to do so.
- We should create any living organism we have the technology to do so.

Rubrics

Q6

MCQ - Single Answer

2.5 marks

CO4

Which of the following is NOT CORRECT about implantable devices

- Implantable devices are in vivo devices placed inside the body
- Issues such as biocompatibility and biofouling are of great concern for implantable devices.
- Implantable devices can be rejected by an inflammatory response due to bio-incompatibility between the host and the device
- None of the above

Rubrics

Q7

MCQ - Single Answer

2.5 marks

CO4

Which is a BioMEMS device

- Glucometer
- Transdermal microneedles
- Pregnancy kit
- All of the above

Rubrics



Q8

MCQ - Single Answer

2.5 marks

CO4

The core principle of bioethics are the following except

- Justice
- Maleficence
- Autonomy
- Beneficence

Rubrics

Q9

MCQ - Single Answer

2.5 marks

CO4

Which of the following is NOT an application of bio-MEMS

- Biosensors based on optical sensing
- Radiography
- Micro-cantilever sensors
- Bacterial identification and antibiotic susceptibility

Rubrics

Q10

MCQ - Single Answer

2.5 marks

CO4

Which of the following is a physico-chemical component

- Enzymes
- Antibodies
- Transducers
- Cell

Rubrics

Q11

MCQ - Single Answer

2.5 marks

CO5

Which of the following is not a criticism of transgenic (same genetics) crop?

- crops that can cross-pollinate
- crops that do not grow as large as regular crops
- crops that cause allergies in humans
- crops that cause unknown diseases in humans.

Rubrics

Q12

MCQ - Single Answer

2.5 marks

CO5

Which of the following is NOT a component of microelectromechanical system (MEMS)

- Sensor
- Transducer
- Actuator
- Pacemaker

Rubrics

Q13

MCQ - Single Answer

2.5 marks

CO5

Amongst BioMEMS materials, which material offers transduction property?

- Silicon
- Glass
- PMMA
- Teflon

Rubrics

Q14

MCQ - Single Answer

2.5 marks

CO5

Bioethics is the study of typically controversial ethics brought about by advances in biology and medicine. It is also moral discernment as it relates to medical policy, practice, and research.

- TRUE
- FALSE

Rubrics

Q15

MCQ - Single Answer

2.5 marks

COS

MEMS/Bio-MEMS devices can be realized from a variety of materials, which can be grouped as

- inorganic materials like silicon and glass
- organic materials which include polymers like SU-8, PMMA, PDMS etc.
- biomaterials like DNA, RNA, and proteins which are utilized as biomimetic materials
- All of the above

Rubrics

Q16

MCQ - Single Answer

2.5 marks

COS

Which of these biosensors use principle of heat released/absorbed by a reaction

- Potentiometric biosensor
- Optical biosensors
- Piezoelectric biosensors
- Calorimetric biosensors

Rubrics

Q17

MCQ - Single Answer

2.5 marks

COS

The branch of philosophy relating to morals or moral principles is

- bioethics
- law
- ethics
- applied ethics

Q18

MCQ - Single Answer

2.5 marks

CO5

Regarding the concept of bioethics which of the following statement is false?

- It has to do only with cloning and euthanasia
- Bioethics is the same as Medical ethics
- It has to do with moral dimension of Medical care
- It has to do with all aspect of Medical care

Rubrics

Q19

MCQ - Single Answer

2.5 marks

CO5

PMMA (Polymethyl meth acrylate) is a viscoelastic polymer that has been widely used in the fabrication of microfluidic chips for DNA hybridization assays,antigen-antibody interactions, and cell culture

- TRUE
- FALSE

Rubrics

Q20

MCQ - Single Answer

2.5 marks

CO5

The code of ethics dealing with experimentation on human subjects is

- the Hippocratic Oath
- the Nuremberg Code
- Nonexistent
- A conflict of Interest

Rubrics

Q21

MCQ - Single Answer

2.5 marks

CO5

Illegal acts are

- Always ethical
- Frequently ethical
- Usually unethical
- All of the above

Rubrics