

# Andhra Pradesh State Council of Higher Education

## Notations :

- 1.Options shown in green color and with ✓ icon are correct.
- 2.Options shown in red color and with ✗ icon are incorrect.

<b>Question Paper Name :</b>	Bio Technology 28th Sep 2021 Shift1
<b>Duration :</b>	120
<b>Total Marks :</b>	120
<b>Display Marks:</b>	No
<b>Share Answer Key With Delivery Engine :</b>	Yes
<b>Calculator :</b>	None
<b>Magnifying Glass Required? :</b>	No
<b>Ruler Required? :</b>	No
<b>Eraser Required? :</b>	No
<b>Scratch Pad Required? :</b>	No
<b>Rough Sketch/Notepad Required? :</b>	No
<b>Protractor Required? :</b>	No
<b>Show Watermark on Console? :</b>	Yes
<b>Highlighter :</b>	No
<b>Auto Save on Console? ( SA type of questions will be always auto saved ) :</b>	Yes
<b>Is this Group for Examiner? :</b>	No

## Bio Technology

<b>Section Id :</b>	5875876
<b>Section Number :</b>	1
<b>Mandatory or Optional :</b>	Mandatory
<b>Number of Questions :</b>	120
<b>Section Marks :</b>	120
<b>Enable Mark as Answered Mark for Review and Clear Response :</b>	Yes

**Question Number : 1 Question Id : 587587601 Display Question Number : Yes Is Question**

**Mandatory : No**

During post transcriptional modification in eukaryotes the enzyme involved in adding Guanosine triphosphate to the 5' end of m-RNA is

**Options :**

1. ✘ Guanine-7-methyl transferase
2. ✔ Guanylyl transferase
3. ✘ Guanosine transferase
4. ✘ Guanine transferase

**Question Number : 2 Question Id : 587587602 Display Question Number : Yes Is Question**

**Mandatory : No**

Rifampicin is an antibiotic which inhibits the following process in prokaryotes

**Options :**

1. ✔ Transcription
2. ✘ Translation

3. ✘ Replication

4. ✘ Transduction

**Question Number : 3 Question Id : 587587603 Display Question Number : Yes Is Question Mandatory : No**

Trisomy of chromosome number 13

**Options :**

1. ✘ Turner syndrome

2. ✘ Down's syndrome

3. ✔ Patau syndrome

4. ✘ Edward syndrome

**Question Number : 4 Question Id : 587587604 Display Question Number : Yes Is Question Mandatory : No**

Blood grouping is the classical example for

**Options :**

1. ✘ Mendelian Inheritance

2. ✘ Epistasis

3. ✘ Incomplete dominance

4. ✔ Co-dominance

Question Number : 5 Question Id : 587587605 Display Question Number : Yes Is Question

Mandatory : No

During recombination process the resolution of branch is mediated by

Options :

1. ✘ Rec-A

2. ✘ Ruv-A

3. ✔ Ruv-C

4. ✘ Ruv-B

Question Number : 6 Question Id : 587587606 Display Question Number : Yes Is Question

Mandatory : No

In X-linked dominant disorder if both the parents are carrier of mutated gene. How many of the male and female children will be affected and normal.

Options :

1. ✘ 50% of Son will be affected

2. ✘ 50% of Son will be normal

3. ✘ 50% of Daughter will be affected

4. ✔ Both option 1 and option 2

Question Number : 7 Question Id : 587587607 Display Question Number : Yes Is Question

Mandatory : No

A cross between two genes A and B has resulted in 198 non recombinant progeny and 2 recombinant progenies. Calculate the recombination frequency between the two genes.

**Options :**

1. ✘ 10 cM
2. ✘ 100 cM
3. ✔ 1 cM
4. ✘ 0.1 cM

**Question Number : 8 Question Id : 587587608 Display Question Number : Yes Is Question**

**Mandatory : No**

Which RNA polymerase act as precursor to 5S rRNA and t-RNA

**Options :**

1. ✘ RNA Polymerase II
2. ✘ RNA Polymerase I
3. ✔ RNA Polymerase III
4. ✘ RNA Polymerase IV

**Question Number : 9 Question Id : 587587609 Display Question Number : Yes Is Question**

**Mandatory : No**

How does the core enzyme differs from holo enzyme in prokaryotic RNA polymerase

**Options :**

1. ✔ Core enzyme has 2  $\alpha$  and 2  $\beta$  subunits

2. ✘ Core enzyme has 1  $\alpha$  and 2  $\beta$  subunits
3. ✘ Core enzyme has 2  $\alpha$ , 2  $\beta$  and  $\sigma$  subunits
4. ✘ Core enzyme has 2  $\alpha$  and 1  $\beta$  subunits

**Question Number : 10 Question Id : 587587610 Display Question Number : Yes Is Question**

**Mandatory : No**

Shine-Dalgarno sequence is present in m-RNA which has complementarity with

**Options :**

1. ✘ 50 S rRNA
2. ✘ 60 S rRNA
3. ✔ 16 S rRNA
4. ✘ 40 S rRNA

**Question Number : 11 Question Id : 587587611 Display Question Number : Yes Is Question**

**Mandatory : No**

Name the initiation factor which helps in carrying the aminoacyl t-RNA to P site of ribosome

**Options :**

1. ✔ IF 2
2. ✘ IF 1

3. ✖ IF 3

4. ✖ IF 4

**Question Number : 12 Question Id : 587587612 Display Question Number : Yes Is Question Mandatory : No**

Which of the following is a termination codon

**Options :**

1. ✔ UAA

2. ✖ UAC

3. ✖ AUG

4. ✖ GAA

**Question Number : 13 Question Id : 587587613 Display Question Number : Yes Is Question Mandatory : No**

Which DNA Polymerase is involved leading strand synthesis in prokaryotes

**Options :**

1. ✖ DNA Polymerase I

2. ✖ DNA Polymerase II

3. ✔ DNA Polymerase III

4. ✖ DNA Polymerase IV

Question Number : 14 Question Id : 587587614 Display Question Number : Yes Is Question

Mandatory : No

Role of FEN I proteins in eukaryotic DNA replication

Options :

1. ✘ Removes DNA sequence
2. ✘ Adds RNA sequence
3. ✔ Removes RNA sequence
4. ✘ Adds DNA sequence

Question Number : 15 Question Id : 587587615 Display Question Number : Yes Is Question

Mandatory : No

Telomerase is

Options :

1. ✔ RNA dependent DNA Polymerase
2. ✘ DNA dependent RNA Polymerase
3. ✘ DNA dependent DNA Polymerase
4. ✘ RNA dependent RNA Polymerase

Question Number : 16 Question Id : 587587616 Display Question Number : Yes Is Question

Mandatory : No

Callus formation takes place if the concentration of auxin to cytokinin is



**Options :**

1. ✘ 1:2

2. ✔ 1:1

3. ✘ 2:1

4. ✘ 1:4

**Question Number : 17 Question Id : 587587617 Display Question Number : Yes Is Question**

**Mandatory : No**

Phytohormone responsible for breaking seed dormancy and parthenocarpy

**Options :**

1. ✘ Auxin

2. ✘ Cytokinins

3. ✘ Ethylene

4. ✔ Gibberillins

**Question Number : 18 Question Id : 587587618 Display Question Number : Yes Is Question**

**Mandatory : No**

In plant tissue culture cell synchronization can be achieved by

**Options :**

1. ✘ 2-Ethyl-deoxy uridne

2. ✘ 5-Chloro deoxy uridine

3. ✘ 5-Fluro deoxy uridine

4. ✔ Both option 2 and option 3

**Question Number : 19 Question Id : 587587619 Display Question Number : Yes Is Question Mandatory : No**

Name the secondary metabolite produced by *Catharantus roseus* plant

**Options :**

1. ✘ Menthol

2. ✘ Paclitaxel

3. ✘ Vanillin

4. ✔ Vinbalstin

**Question Number : 20 Question Id : 587587620 Display Question Number : Yes Is Question Mandatory : No**

Cell culture technique used for the production of secondary metabolites

**Options :**

1. ✘ Somatic embryogenesis

2. ✘ Micropropagation

3. ✔ Hairy root culture

4. ✖ Organogenesis

Question Number : 21 Question Id : 587587621 Display Question Number : Yes Is Question Mandatory : No

Most commonly used bioreactor for producing Hairy root culture

Options :

1. ✖ Stirred tank bioreactor
2. ✖ Bubble column bioreactor
3. ✖ Batch bioreactor
4. ✔ Both option 1 and option 2

Question Number : 22 Question Id : 587587622 Display Question Number : Yes Is Question Mandatory : No

Secondary metabolite used for the treatment of Malaria

Options :

1. ✖ Shikonin
2. ✖ Berberine
3. ✔ Quinine
4. ✖ Anthraquinone

Question Number : 23 Question Id : 587587623 Display Question Number : Yes Is Question

Mandatory : No

Cytoplasm of two parents and nuclear genome of one parent

Options :

1. ✓ Cybrid
2. ✗ Hybrid
3. ✗ Symmetric hybrid
4. ✗ Asymmetric hybrid

Question Number : 24 Question Id : 587587624 Display Question Number : Yes Is Question

Mandatory : No

If we delete the following gene *Agrobacterium tumifaciens* species cannot infect the plant cell

Options :

1. ✗ Vir B
2. ✓ Vir A
3. ✗ Vir D
4. ✗ Vir E

Question Number : 25 Question Id : 587587625 Display Question Number : Yes Is Question

Mandatory : No

Plant cell differs from animal cell as they are

**Options :**

1. ✘ Unipotent
2. ✘ Multipotent
3. ✔ Totipotent
4. ✘ Pluripotent

**Question Number : 26 Question Id : 587587626 Display Question Number : Yes Is Question Mandatory : No**

The experiment conducted on mice using live non capsulated *Pneumococci* (R) and heat killed capsulated *Pneumococci* (S) is an example for

**Options :**

1. ✔ Transformation
2. ✘ Conjugation
3. ✘ Transduction
4. ✘ Translation

**Question Number : 27 Question Id : 587587627 Display Question Number : Yes Is Question Mandatory : No**

If the flagella in bacteria is present at both the ends then it is called as

**Options :**

1. ✓ Amphitrichous
2. ✗ Lophotrichous
3. ✗ Peritrichous
4. ✗ Monotrichous

**Question Number : 28 Question Id : 587587628 Display Question Number : Yes Is Question Mandatory : No**

How does Gram positive bacteria differ from Gram negative

**Options :**

1. ✗ Gram positive bacteria has less peptidoglycan layer
2. ✗ Gram positive bacteria has high lipid layer
3. ✓ Gram positive bacteria has high amount of peptidoglycan layer
4. ✗ Both option 1 and option 2

**Question Number : 29 Question Id : 587587629 Display Question Number : Yes Is Question Mandatory : No**

Packaging of proteins takes place in which cell organelle

**Options :**

1. ✗ Ribosomes
2. ✗ Endoplasmic reticulum

3. ✓ Golgi bodies

4. ✗ Mitochondria

Question Number : 30 Question Id : 587587630 Display Question Number : Yes Is Question

Mandatory : No

Balance the given equation  $6 \text{CO}_2 + \text{X H}_2\text{O} + \text{Light energy} \longrightarrow \text{C}_6\text{H}_{12}\text{O}_6 + \text{X O}_2$

Options :

1. ✗ 6 H<sub>2</sub>O; 3O<sub>2</sub>

2. ✓ 6 H<sub>2</sub>O; 6O<sub>2</sub>

3. ✗ 3 H<sub>2</sub>O; 6O<sub>2</sub>

4. ✗ 3H<sub>2</sub>O; 3O<sub>2</sub>

Question Number : 31 Question Id : 587587631 Display Question Number : Yes Is Question

Mandatory : No

Which of the following is true for aerobic respiration

Options :

1. ✓ Occurs in presence of O<sub>2</sub>; ATP production more

2. ✗ Occurs in the absence of O<sub>2</sub>; ATP production less

3. ✗ Occurs in the absence of O<sub>2</sub>; ATP production more

4. ✘ Occurs in presence of O<sub>2</sub>; ATP production less

**Question Number : 32 Question Id : 587587632 Display Question Number : Yes Is Question**

**Mandatory : No**

Thymine dimer formation occurs due to which mutation

**Options :**

1. ✘ Deamination

2. ✘ Oxidation

3. ✔ UV light

4. ✘ Depurination

**Question Number : 33 Question Id : 587587633 Display Question Number : Yes Is Question**

**Mandatory : No**

The genetic material of Corona Virus is

**Options :**

1. ✔ Single strand (+) RNA

2. ✘ Single strand (+) DNA

3. ✘ Double strand (+) DNA

4. ✘ Double strand (+) RNA

**Question Number : 34 Question Id : 587587634 Display Question Number : Yes Is Question**



**Mandatory : No**

During Lytic cycle the host DNA is cleaved by nuclease produced by the following viral genes

**Options :**

1. ✓ Immediate early genes
2. ✘ Delayed early genes
3. ✘ Late genes
4. ✘ Delayed genes

**Question Number : 35 Question Id : 587587635 Display Question Number : Yes Is Question**

**Mandatory : No**

Name the bacteria which is involved in symbiotic nitrogen fixation in the root nodules of legume plants

**Options :**

1. ✘ Azotobacter
2. ✘ Clostridium
3. ✓ Rhizobium
4. ✘ Pseudomonas

**Question Number : 36 Question Id : 587587636 Display Question Number : Yes Is Question**

**Mandatory : No**

The total energy yield from one glucose molecule during cellular respiration is

**Options :**

1. ✘ 32

2. ✘ 30

3. ✔ 36

4. ✘ 34

**Question Number : 37 Question Id : 587587637 Display Question Number : Yes Is Question**

**Mandatory : No**

If the signaling molecule and the receptor are present on same cell then it is called as

**Options :**

1. ✘ Contact dependent signaling

2. ✘ Synaptic signaling

3. ✔ Autocrine signaling

4. ✘ Endocrine signaling

**Question Number : 38 Question Id : 587587638 Display Question Number : Yes Is Question**

**Mandatory : No**

During which phase of cell cycle doubling of DNA takes place

**Options :**

1. ✘ G1 Phase

2. ✔ S Phase

3. ✖ G2 Phase

4. ✖ M Phase

**Question Number : 39 Question Id : 587587639 Display Question Number : Yes Is Question Mandatory : No**

Name the cell organelle which produces Cytochrome c during apoptosis process

**Options :**

1. ✖ Endoplasmic reticulum

2. ✖ Golgi apparatus

3. ✖ Ribosomes

4. ✔ Mitochondria

**Question Number : 40 Question Id : 587587640 Display Question Number : Yes Is Question Mandatory : No**

Insulin is the best example for protein with

**Options :**

1. ✔ Primary structure

2. ✖ Secondary structure

3. ✖ Tertiary structure

4. ✘ Quaternary structure

Question Number : 41 Question Id : 587587641 Display Question Number : Yes Is Question

Mandatory : No

Enzymatic reaction involving an un competitive inhibitor

Options :

1. ✘ Km increase; Vmax constant
2. ✘ Km decrease; Vmax increase
3. ✘ Km constant; Vmax decrease
4. ✔ Km increase; Vmax decreases

Question Number : 42 Question Id : 587587642 Display Question Number : Yes Is Question

Mandatory : No

Allosteric enzymes differ from Michaelis Menten enzyme by

Options :

1. ✘ Catalyze reversible reactions; generate Sigmoidal curve
2. ✘ Catalyze irreversible reaction; generate Hyperbolic curve
3. ✘ Catalyze reversible reactions; generate Hyperbolic curve
4. ✔ Catalyze irreversible reaction; generate Sigmoidal curve

Question Number : 43 Question Id : 587587643 Display Question Number : Yes Is Question

Mandatory : No

Pertussis toxin increases the levels of which secondary messenger

Options :

1. ✓ cAMP
2. ✗ cGMP
3. ✗ Calcium
4. ✗ Inositol triphosphate (IP3)

Question Number : 44 Question Id : 587587644 Display Question Number : Yes Is Question

Mandatory : No

In active G protein coupled receptor is a heterotrimeric protein complex. But when activated

Options :

1. ✓ G  $\alpha$  subunit gets separated from  $\beta$ ,  $\gamma$  complex
2. ✗ G  $\beta$  subunit gets separated from  $\sigma$ ,  $\gamma$  complex
3. ✗ G  $\gamma$  subunit gets separated from  $\alpha$ ,  $\beta$  complex
4. ✗ G  $\sigma$  subunit gets separated from  $\beta$ ,  $\gamma$  complex

Question Number : 45 Question Id : 587587645 Display Question Number : Yes Is Question

Mandatory : No

Movement of molecules across the cell by symporter mechanism comes under

**Options :**

1. ✘ Passive transport
2. ✘ Bulk transport
3. ✘ Osmosis
4. ✔ Active transport

**Question Number : 46 Question Id : 587587646 Display Question Number : Yes Is Question**

**Mandatory : No**

Herd immunity is part of

**Options :**

1. ✔ Innate Immunity
2. ✘ Acquired Immunity
3. ✘ Cell mediated Immunity
4. ✘ Humoral Immunity

**Question Number : 47 Question Id : 587587647 Display Question Number : Yes Is Question**

**Mandatory : No**

Ele Metchnikoff is the scientist who proved

**Options :**

1. ✘ Innate Immunity

2. ✘ Acquired Immunity

3. ✔ Cell mediated Immunity

4. ✘ Humoral Immunity

**Question Number : 48 Question Id : 587587648 Display Question Number : Yes Is Question**

**Mandatory : No**

During allergic reactions the population of following cells will increase

**Options :**

1. ✘ Basophils

2. ✘ Mast cells

3. ✘ Neutrophils

4. ✔ Eosinophils

**Question Number : 49 Question Id : 587587649 Display Question Number : Yes Is Question**

**Mandatory : No**

Major histocompatibility complex II is present on cell surface of

**Options :**

1. ✘ Macrophages

2. ✘ Dendritic cells

3. ✘ T-cytotoxic cells

4. ✓ Both option 1 and option 2

**Question Number : 50 Question Id : 587587650 Display Question Number : Yes Is Question Mandatory : No**

Hassall's corpuscles are found in following organs

**Options :**

1. ✗ Bone marrow

2. ✗ Spleen

3. ✗ Lymph node

4. ✓ Thymus

**Question Number : 51 Question Id : 587587651 Display Question Number : Yes Is Question Mandatory : No**

Forssman antigen is an example for

**Options :**

1. ✓ Heterospecific antigen

2. ✗ Auto specific antigen

3. ✗ Iso specific antigen

4. ✗ Organ specific antigen



Question Number : 52 Question Id : 587587652 Display Question Number : Yes Is Question

Mandatory : No

For synthesis of monoclonal antibodies mutated forms of B-cells and Myeloma cells are used which are

Options :

1. ✓ TK<sup>-</sup> and HGPRT<sup>+</sup>; TK<sup>+</sup> and HGPRT<sup>-</sup>
2. ✗ TK<sup>+</sup> and HGPRT<sup>-</sup>; TK<sup>-</sup> and HGPRT<sup>+</sup>
3. ✗ TK<sup>-</sup> and HGPRT<sup>-</sup>; TK<sup>+</sup> and HGPRT<sup>+</sup>
4. ✗ TK<sup>+</sup> and HGPRT<sup>+</sup>; TK<sup>-</sup> and HGPRT<sup>+</sup>

Question Number : 53 Question Id : 587587653 Display Question Number : Yes Is Question

Mandatory : No

Antibody produced by infant after birth with antiviral activity

Options :

1. ✗ Ig A
2. ✗ Ig G
3. ✗ Ig D
4. ✓ Ig M

Question Number : 54 Question Id : 587587654 Display Question Number : Yes Is Question

Mandatory : No

Widal test is the best example for which type of antigen antibody reaction

**Options :**

1. ✘ Co-agglutination
2. ✘ Passive agglutination
3. ✘ Haemagglutination
4. ✔ Bacterial agglutination

**Question Number : 55 Question Id : 587587655 Display Question Number : Yes Is Question**

**Mandatory : No**

Immune complex mediated hyper sensitivity is observed in

**Options :**

1. ✔ Serum sickness
2. ✘ Drug-induced systemic lupus erythematosus
3. ✘ Rh in compatibility
4. ✘ Contact dermatitis

**Question Number : 56 Question Id : 587587656 Display Question Number : Yes Is Question**

**Mandatory : No**

Which class of restriction enzyme cuts the DNA sequence near the target site

**Options :**

1. ✘ Restriction enzyme I

2. ✓ Restriction enzyme II

3. ✗ Restriction enzyme III

4. ✗ Restriction enzyme IV

**Question Number : 57 Question Id : 587587657 Display Question Number : Yes Is Question Mandatory : No**

Name the disease which was treated for the first-time using gene therapy is

**Options :**

1. ✓ Severe combined immuno deficiency

2. ✗ Haemophilia

3. ✗ Thalassemia

4. ✗ Cystic fibrosis

**Question Number : 58 Question Id : 587587658 Display Question Number : Yes Is Question Mandatory : No**

In Cosmid we can clone DNA sequence up to

**Options :**

1. ✗ 100 kb

2. ✗ 200 kb

3. ✓ 45 kb

4. ✗ 500 kb

**Question Number : 59 Question Id : 587587659 Display Question Number : Yes Is Question Mandatory : No**

During southern blotting the membrane is treated with HRP-conjugated streptavidin followed by incubation with tetramethylbenzidine and  $H_2O_2$  as a result

**Options :**

1. ✗ DNA probe gives Green color

2. ✗ DNA probe gives Red color

3. ✓ DNA probe gives Blue color

4. ✗ DNA probe gives Yellow color

**Question Number : 60 Question Id : 587587660 Display Question Number : Yes Is Question Mandatory : No**

Technique used to search the position of a gene on the chromosome

**Options :**

1. ✗ Southern blotting

2. ✓ Chromosome walking

3. ✗ Genomic DNA Library

4. ✗ RAPD

Question Number : 61 Question Id : 587587661 Display Question Number : Yes Is Question

Mandatory : No

Which vector is used to create genomic libraries for human genome

Options :

1. ✓ Bacterial artificial chromosome
2. ✗ Cosmid
3. ✗ Phagemid
4. ✗ Plasmid

Question Number : 62 Question Id : 587587662 Display Question Number : Yes Is Question

Mandatory : No

Which of the following is true for Alkaline Phosphatase

Options :

1. ✗ Digest linear plasmid
2. ✗ Removes 5'-terminal phosphate
3. ✗ Removes 3'-terminal phosphate
4. ✓ Both option 1 and option 2

Question Number : 63 Question Id : 587587663 Display Question Number : Yes Is Question

**Mandatory : No**

The melting temperature ( $T_m$ ) of the forward and reverse primers used in PCR should be

**Options :**

1. ✘  $> 0.5-1^\circ\text{C}$
2. ✔  $> 2^\circ\text{C}$
3. ✘ Should be same
4. ✘  $< 0.5^\circ\text{C}$

**Question Number : 64 Question Id : 587587664 Display Question Number : Yes Is Question**

**Mandatory : No**

Shotgun sequencing method is used to identify

**Options :**

1. ✔ Overlapping sequence
2. ✘ Non overlapping sequence
3. ✘ Individual DNA sequence
4. ✘ Both option 1 and option 2

**Question Number : 65 Question Id : 587587665 Display Question Number : Yes Is Question**

**Mandatory : No**

Which one the following is an example for vector less gene transfer method

**Options :**

1. ✘ Microinjection
2. ✘ Agrobacterium mediated gene transfer
3. ✘ Electroporation
4. ✔ Both option 1 and option 3

**Question Number : 66 Question Id : 587587666 Display Question Number : Yes Is Question Mandatory : No**

*Saccharomyces cerevisiae* is used industrially for the production of

**Options :**

1. ✘ Citric acid
2. ✘ Lactic acid
3. ✔ Ethanol
4. ✘ Acetic acid

**Question Number : 67 Question Id : 587587667 Display Question Number : Yes Is Question Mandatory : No**

Secondary metabolites are produced during which phase of bacterial cell cycle

**Options :**

1. ✘ Lag phase
2. ✘ Log phase

3. ✓ Stationary phase

4. ✗ Death phase

**Question Number : 68 Question Id : 587587668 Display Question Number : Yes Is Question Mandatory : No**

Which one of the following is not produced by animal cell culture technique

**Options :**

1. ✗ Antibodies

2. ✗ Hormones

3. ✓ Antibiotics

4. ✗ Vaccines

**Question Number : 69 Question Id : 587587669 Display Question Number : Yes Is Question Mandatory : No**

Among all the immobilization techniques which one is considered to be more stable

**Options :**

1. ✗ Adsorption

2. ✗ Entrapment

3. ✗ Encapsulation

4. ✓ Covalent



Question Number : 70 Question Id : 587587670 Display Question Number : Yes Is Question

Mandatory : No

Immobilized enzymes exhibit the following advantages except one

Options :

1. ✘ Reuse of catalyst
2. ✔ Low surface area for binding
3. ✘ Simple and economic
4. ✘ Limited loss of activity

Question Number : 71 Question Id : 587587671 Display Question Number : Yes Is Question

Mandatory : No

Recombinant proteins expressed in bacteria and yeast are

Options :

1. ✘ Intracellular
2. ✘ Extracellular
3. ✘ Both intra and extracellular
4. ✔ Intracellular in bacteria; Yeast (intra and extracellular)

Question Number : 72 Question Id : 587587672 Display Question Number : Yes Is Question

Mandatory : No

In a thin layer chromatography experiment distance travelled by solute was 10 cm and the solvent was 17 cm. Calculate the Rf value of the given sample.

**Options :**

1. ✘ 0.7

2. ✘ 1

3. ✔ 0.58

4. ✘ 0.4

**Question Number : 73 Question Id : 587587673 Display Question Number : Yes Is Question**

**Mandatory : No**

Which chromatographic technique is used for purification and quantification of sample

**Options :**

1. ✘ Size exclusion chromatography

2. ✘ Affinity chromatography

3. ✔ High performance liquid chromatography

4. ✘ Paper chromatography

**Question Number : 74 Question Id : 587587674 Display Question Number : Yes Is Question**

**Mandatory : No**

Recombinant proteins are usually tagged with Histidine to ease their purification by

**Options :**

1. ✓ Affinity chromatography
2. ✗ Gel filtration chromatography
3. ✗ Adsorption chromatography
4. ✗ Gas chromatography

**Question Number : 75 Question Id : 587587675 Display Question Number : Yes Is Question Mandatory : No**

Industrially important enzyme L-Asparaginases is used to treat

**Options :**

1. ✓ Leukemia
2. ✗ Breast Cancer
3. ✗ Colon Cancer
4. ✗ Prostate Cancer

**Question Number : 76 Question Id : 587587676 Display Question Number : Yes Is Question Mandatory : No**

Chlorination is performed during which stage of waste water treatment process

**Options :**

1. ✗ Primary
2. ✗ Secondary

3. ✓ Tertiary

4. ✗ Both option 1 and option 2

**Question Number : 77 Question Id : 587587677 Display Question Number : Yes Is Question Mandatory : No**

The components involved in secondary treatment of waste water

**Options :**

1. ✗ Activated sludge process

2. ✗ Trickling filter process

3. ✗ Ozone treatment

4. ✓ Both option 1 and option 2

**Question Number : 78 Question Id : 587587678 Display Question Number : Yes Is Question Mandatory : No**

Which one of the following is not used in *In situ* bioremediation process

**Options :**

1. ✗ Bio sparging

2. ✗ Bio augmentation

3. ✗ Bioventing

4. ✓ Biopiles

Question Number : 79 Question Id : 587587679 Display Question Number : Yes Is Question Mandatory : No

Microorganisms used to clean a particular contaminant of soil or water is termed as

Options :

1. ✓ Bioaugmentation

2. ✗ Bio stimulation

3. ✗ Intrinsic Bioremediation

4. ✗ Bioleaching

Question Number : 80 Question Id : 587587680 Display Question Number : Yes Is Question Mandatory : No

Industrially invertase is produced by

Options :

1. ✗ *Asperigillus niger*

2. ✗ *Bacillus amyloliquefaciens*

3. ✓ *Saccharomyces cerevisiae*

4. ✗ *Pseudomonas species*

Question Number : 81 Question Id : 587587681 Display Question Number : Yes Is Question

Mandatory : No

A data base of current sequence map of the human genome is called as

Options :

1. ✘ OMIM
2. ✘ HGMD
3. ✘ Gene cards
4. ✔ Golden path

Question Number : 82 Question Id : 587587682 Display Question Number : Yes Is Question

Mandatory : No

Which one of the following is an nucleotide sequence data base

Options :

1. ✔ EMBL
2. ✘ SWISS PROT
3. ✘ PROSITE
4. ✘ TREMBL

Question Number : 83 Question Id : 587587683 Display Question Number : Yes Is Question

Mandatory : No

Clustal W is used for

Options :

1. ✓ Multiple sequence alignment
2. ✗ Pairwise alignment
3. ✗ Phylogenetic analysis
4. ✗ Protein structure

**Question Number : 84 Question Id : 587587684 Display Question Number : Yes Is Question Mandatory : No**

A database which is used for determining the enzymatic pathways is

**Options :**

1. ✗ SCOP
2. ✓ KEGG
3. ✗ Pfam
4. ✗ DDBJ

**Question Number : 85 Question Id : 587587685 Display Question Number : Yes Is Question Mandatory : No**

“ORF finder” is used to search DNA sequences for prediction of

**Options :**

1. ✗ CpG regions
2. ✗ Restriction enzyme sites

3. ✓ Protein encoding regions
4. ✗ Gene expression regulatory regions

**Question Number : 86 Question Id : 587587686 Display Question Number : Yes Is Question Mandatory : No**

Which one of the following is an example for Homology and similarity search tool

**Options :**

1. ✗ RasMol
2. ✗ EMBOSS
3. ✓ BLAST
4. ✗ PROSPECT

**Question Number : 87 Question Id : 587587687 Display Question Number : Yes Is Question Mandatory : No**

The computational methodology that finds best matching between two molecules (i.e) receptor, and ligand is called as

**Options :**

1. ✓ Molecular docking
2. ✗ Molecular fitting
3. ✗ Molecular matching



4. ✘ Molecular affinity

Question Number : 88 Question Id : 587587688 Display Question Number : Yes Is Question

Mandatory : No

Proteomics is the study related to

Options :

1. ✘ Set of proteins
2. ✘ Proteins in a specialized region of the cell
3. ✔ Total proteins expressed in the cell
4. ✘ Biomolecules

Question Number : 89 Question Id : 587587689 Display Question Number : Yes Is Question

Mandatory : No

Phylogenetic relationship can be shown by

Options :

1. ✔ Dendrogram
2. ✘ Gene Bank
3. ✘ Data retrieving tool
4. ✘ Data search tool

Question Number : 90 Question Id : 587587690 Display Question Number : Yes Is Question

Mandatory : No

PRINTS are software used for

Options :

1. ✘ Detection of genes from genome sequence
2. ✘ Detection of tRNA genes
3. ✘ Prediction of function of a new gene
4. ✔ Identification of functional domains/motifs of proteins

Question Number : 91 Question Id : 587587691 Display Question Number : Yes Is Question

Mandatory : No

The virus commonly used to infect cell cultures for the production of interferon is

Options :

1. ✘ Corona virus
2. ✔ Sendai virus
3. ✘ Polio virus
4. ✘ Small pox virus

Question Number : 92 Question Id : 587587692 Display Question Number : Yes Is Question

Mandatory : No

Animal cell cultures are widely used for the production of

**Options :**

1. ✘ Insulin
2. ✘ Somatostatin
3. ✔ Monoclonal antibodies
4. ✘ Thyroxine

**Question Number : 93 Question Id : 587587693 Display Question Number : Yes Is Question Mandatory : No**

Culture freshly prepared from isolated tissue is known as

**Options :**

1. ✘ Organ culture
2. ✔ Primary culture
3. ✘ Cell line
4. ✘ Histotypic culture

**Question Number : 94 Question Id : 587587694 Display Question Number : Yes Is Question Mandatory : No**

The advantage of animal tissue culture is

**Options :**

1. ✔ Cell lines can be stored for long time

2. ✘ Maintenance of environmental conditions is easy
3. ✘ Cost effective
4. ✘ No skilled personal is required

**Question Number : 95 Question Id : 587587695 Display Question Number : Yes Is Question Mandatory : No**

In animal cell culture particularly mammalian cell culture transformation means

**Options :**

1. ✘ Uptake of new genetic material
2. ✔ Phenotypic modification of cells in culture
3. ✘ Both option 1 and option 2
4. ✘ Release of genetic information

**Question Number : 96 Question Id : 587587696 Display Question Number : Yes Is Question Mandatory : No**

The cell lines used for the production of polio vaccine is

**Options :**

1. ✔ Primary kidney cell line
2. ✘ CHO cell line
3. ✘ Mouse fibroblast cell line

4. ✘ Dog kidney cell line

**Question Number : 97 Question Id : 587587697 Display Question Number : Yes Is Question Mandatory : No**

Which one of the following is not used for preservation of animal cell lines

**Options :**

1. ✔ Glycerol

2. ✘ Ethanol

3. ✘ DMSO

4. ✘ Ethylene glycol

**Question Number : 98 Question Id : 587587698 Display Question Number : Yes Is Question Mandatory : No**

Indicator used to check the pH change of animal cell culture media is

**Options :**

1. ✘ Saffranin

2. ✘ Crystal violet

3. ✘ Methylene blue

4. ✔ Phenol red

Question Number : 99 Question Id : 587587699 Display Question Number : Yes Is Question

Mandatory : No

Which of the following bioreactor is most commonly used for growing suspension cell culture

Options :

1. ✘ Air lift Bioreactor
2. ✔ Disposable bioreactor
3. ✘ Stirred tank Bioreactor
4. ✘ Continuous Bioreactor

Question Number : 100 Question Id : 587587700 Display Question Number : Yes Is Question

Mandatory : No

Increase in lactate concentration during animal cell culture has resulted in poor growth due to

Options :

1. ✘ Excess lactate caused ethanol production
2. ✘ Excess lactate caused oxygen production
3. ✔ Excess lactate decreased oxygen production
4. ✘ Excess lactate inhibited Glycolysis

Question Number : 101 Question Id : 587587701 Display Question Number : Yes Is Question

Mandatory : No

A continuous reactor has a dilution rate of  $0.5 \text{ h}^{-1}$ . Its residence time would be

Options :

1. ✓ 2 h

2. ✗ 1 h

3. ✗ 0.5 h

4. ✗ 3 h

**Question Number : 102 Question Id : 587587702 Display Question Number : Yes Is Question Mandatory : No**

Heat transfer rates (per unit volume) will be lowest in

**Options :**

1. ✗ Stirred tank bioreactor with biomass recycle

2. ✗ Continuous air lift bioreactor

3. ✓ Continuous packed bed reactor

4. ✗ Continuous fluidized bed bioreactor

**Question Number : 103 Question Id : 587587703 Display Question Number : Yes Is Question Mandatory : No**

According to Monod model the specific growth rate

**Options :**

will increase with the concentration of the growth limiting substrate until it reaches a

1. ✓ maximum value

2. ✘ will decrease with the concentration of the growth limiting substrate
3. ✘ will increase with the concentration of the growth limiting substrate
4. ✘ does not depend on growth limiting substrate

**Question Number : 104 Question Id : 587587704 Display Question Number : Yes Is Question Mandatory : No**

Population doubling time,  $t_d$  can be expressed as (where  $\mu$  is the specific growth rate.)

**Options :**

1. ✘  $\log 2/\mu$
2. ✔  $\ln 2/\mu$
3. ✘  $\mu/\ln 2$
4. ✘  $\mu/\log 2$

**Question Number : 105 Question Id : 587587705 Display Question Number : Yes Is Question Mandatory : No**

A higher  $K_s$  value of Monod's equation means

**Options :**

1. ✔ greater affinities to substrate
2. ✘ lower affinities to substrate
3. ✘ unaffected with the substrate bonding



4. ✘ lower dissociation constant value

Question Number : 106 Question Id : 587587706 Display Question Number : Yes Is Question

Mandatory : No

The specific growth rate ( $\mu$ ) is defined as

Options :

1. ✘ the concentration of biomass in the reactor

2. ✘ rate of increase of total biomass in a reactor

3. ✔ the rate of individual cells division or increase in their biomass

4. ✘ the rate of cell death

Question Number : 107 Question Id : 587587707 Display Question Number : Yes Is Question

Mandatory : No

The specific death rate of an organism can be expressed as

Options :

1. ✔  $\ln 2/D$

2. ✘  $D/\ln 2$

3. ✘  $D \cdot \ln 2$

$0.3/\ln 2$

4. ✘

**Question Number : 108 Question Id : 587587708 Display Question Number : Yes Is Question**

**Mandatory : No**

During the enzymatic reaction of an immobilized enzyme, the rate of substrate transfer is

**Options :**

1. ✓ Equal to that of substrate consumption
2. ✗ More than that of substrate consumption
3. ✗ Lesser than that of substrate consumption
4. ✗ Independent of substrate consumption

**Question Number : 109 Question Id : 587587709 Display Question Number : Yes Is Question**

**Mandatory : No**

A strain of *Escherichia coli* has a maximum specific growth rate of  $0.8 \text{ h}^{-1}$  on a glucose based medium. If this organism is being grown in a chemostat with a dilution rate of  $1.2 \text{ h}^{-1}$ , then at steady state the concentration of *E. coli* in the same medium will

**Options :**

1. ✗ Increase
2. ✓ Zero
3. ✗ Change randomly
4. ✗ Decrease

Question Number : 110 Question Id : 587587710 Display Question Number : Yes Is Question

Mandatory : No

Two continuous bioreactors containing the same organisms, fed with the same feed at the same dilution rate were compared. Reactor 1 started with an initial concentration of glucose of  $10 \text{ g.l}^{-1}$ , while reactor 2 contained  $0.1 \text{ g.l}^{-1}$  of glucose at the start of the process then at steady state

Options :

1. ✘ Concentration of glucose in reactor 1 would be greater than that in reactor 2
2. ✔ Concentration of glucose in reactor 1 would be equal to reactor 2
3. ✘ Concentration of glucose in reactor 1 would always be zero.
4. ✘ Concentration of glucose in reactor 1 would be less than that in reactor 2

Question Number : 111 Question Id : 587587711 Display Question Number : Yes Is Question

Mandatory : No

The general solution of  $\frac{xdx + ydy}{x^2 + y^2} = 0$  is

Options :

1. ✘  $\log(x + y) = c$
2. ✔  $\log(x^2 + y^2) = c$
3. ✘  $\log(xy) = c$
4. ✘  $\log(x - y) = c$

Question Number : 112 Question Id : 587587712 Display Question Number : Yes Is Question

Mandatory : No

The particular integral of  $(D^2 + 5D + 6)y = e^x$  is

Options :

1. ✓  $\frac{e^x}{12}$

2. ✗  $\frac{e^x}{6}$

3. ✗  $\frac{e^x}{10}$

4. ✗  $e^x$

Question Number : 113 Question Id : 587587713 Display Question Number : Yes Is Question

Mandatory : No

If  $A = \begin{bmatrix} 1 & a & a^2 \\ 1 & b & b^2 \\ 1 & c & c^2 \end{bmatrix}$  then,  $\det(A) =$

Options :

1. ✓  $(a-b)(b-c)(c-a)$

2. ✗  $abc$

3. ✗

$$a+b+c$$

$$1+a+b+c$$

4. ✘

Question Number : 114 Question Id : 587587714 Display Question Number : Yes Is Question Mandatory : No

If S is the surface of the sphere  $x^2 + y^2 + z^2 = 1$ , then

$$\int_S (ax\bar{i} + by\bar{j} + cz\bar{k}) \cdot \bar{N} \, ds =$$

Options :

1. ✔  $\frac{4\pi}{3}(a+b+c)$

2. ✘  $4\pi(a+b+c)$

3. ✘  $\frac{\pi}{3}(a+b+c)$

4. ✘  $\pi(a+b+c)$

Question Number : 115 Question Id : 587587715 Display Question Number : Yes Is Question Mandatory : No

Using second order Runge- Kutta method, compute  $y(2.25)$  given

$$\frac{dy}{dx} = \frac{x+y}{x}, \quad y(2)=2 \text{ taking } h=0.25 \text{ (upto three decimals).}$$

**Options :**

1. ✘ 2.453

2. ✔ 2.514

3. ✘ 2.428

4. ✘ 2.412

**Question Number : 116 Question Id : 587587716 Display Question Number : Yes Is Question**

**Mandatory : No**

If  $X$  is a Poisson variate such that  $P(X=2)=P(X=3)$ , then  $P(X=0)=$

**Options :**

1. ✘  $e^2$

2. ✔  $e^{-3}$

3. ✘  $e^3$

4. ✘  $e^{-2}$

**Question Number : 117 Question Id : 587587717 Display Question Number : Yes Is Question**

**Mandatory : No**

Given the probability density function  $f(x)=\frac{k}{1+x^2}$  for  $-\infty < x < \infty$ . Then value of  $k$  is

**Options :**

1. ✘  $\pi$

2. ✘  $2\pi$

3. ✘  $\frac{\pi}{2}$

4. ✔  $\frac{1}{\pi}$

Question Number : 118 Question Id : 587587718 Display Question Number : Yes Is Question Mandatory : No

The rank of the matrix  $\begin{bmatrix} 1 & 3 & 4 \\ 2 & 6 & 8 \end{bmatrix}$  is

Options :

1. ✔ 1

2. ✘ 2

3. ✘ 3

4. ✘ 0

Question Number : 119 Question Id : 587587719 Display Question Number : Yes Is Question Mandatory : No

If  $A = \begin{bmatrix} \cosh\theta & \sinh\theta \\ \sinh\theta & \cosh\theta \end{bmatrix}$ , then  $A^{-1} =$

Options :

1. ✔  $\begin{bmatrix} \cosh\theta & -\sinh\theta \\ -\sinh\theta & \cosh\theta \end{bmatrix}$

2. ✘  $\begin{bmatrix} -\cosh\theta & \sinh\theta \\ \sinh\theta & \cosh\theta \end{bmatrix}$

3. ✘  $\begin{bmatrix} \cosh\theta & -\sinh\theta \\ \sinh\theta & \cosh\theta \end{bmatrix}$

4. ✘ A

Question Number : 120 Question Id : 587587720 Display Question Number : Yes Is Question Mandatory : No

The Taylor's series expansion of  $f(z) = \frac{1}{z}$  about  $z=1$  is

Options :

1. ✘  $1 + (z-1) + (z-1)^2 + (z-1)^3 + \dots$  for  $|z+1| < 1$

2. ✔  $1 - (z-1) + (z-1)^2 - (z-1)^3 + \dots$  for  $|z-1| < 1$

3. ✘  $1 - z + z^2 - z^3 + \dots$  for  $|z| < 1$

4. ✘  $1 + z + z^2 + z^3 + \dots$  for  $|z| < 1$