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.

Question Paper Name :	Bio Technology 19th July 2022 Shift 1
Duration :	120
Total Marks :	120
Display Marks:	No
Share Answer Key With Delivery Engine :	Yes
Calculator :	None
Magnifying Glass Required? :	No
Ruler Required? :	No
Eraser Required? :	No
Scratch Pad Required? :	No
Rough Sketch/Notepad Required? :	No
Protractor Required? :	No
Show Watermark on Console? :	Yes
Highlighter :	No
Auto Save on Console?	Yes
Change Font Color :	No
Change Background Color :	No
Change Theme :	No
Help Button :	No
Show Reports :	No
Show Progress Bar :	No
Is this Group for Examiner? :	No
Examiner permission :	Cant View
Show Progress Bar? :	No

Bio Technology

Section Id :	90030012
Section Number :	1
Mandatory or Optional :	Mandatory
Number of Questions :	120
Section Marks :	120
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0

Question Number : 1 Question Id : 9003001321 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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 : 9003001322 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Name the antibiotic which binds to 50S ribosome subunit and inhibits the protein synthesis in prokaryotes

Options :

1. ✗ Tetracyclin

2. ✗ Streptomycin

3. ✗ Puromycin

4. ✓ Chloramphenicol

Question Number : 3 Question Id : 9003001323 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Trisomy of chromosome number 18

Options :

1. ✗ Turner syndrome

2. ✓ Downs syndrome

3. ✗ Patau syndrome

4. ✗ Edward syndrome

Question Number : 4 Question Id : 9003001324 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Gene interaction that results in the F_2 dihybrid ratio of 9:7 ratio is due to

Options :

1. ✗ Complementation

2. ✓ Epistasis

3. ✖ Incomplete dominance

4. ✖ Co-dominance

Question Number : 5 Question Id : 9003001325 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Resolution of Holliday junction during recombination process is mediated by

Options :

1. ✖ Ruv-D

2. ✖ Ruv-A

3. ✔ Ruv-C

4. ✖ Ruv-B

Question Number : 6 Question Id : 9003001326 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Color blindness is caused due to the following

Options :

1. ✖ X-linked dominant

2. ✔ X-linked recessive

3. ✖ Y- linked dominant

4. ✖ Y- linked recessive

Question Number : 7 Question Id : 9003001327 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a Mendelian cross between parents that are pure for contrasting traits, only one form of the trait will appear in next generation and all the progeny are heterozygous indicates.

Options :

1. ✓ Law of dominance

2. ✗ Law of segregation

3. ✗ Law of independent assortment

4. ✗ Incomplete dominance

Question Number : 8 Question Id : 9003001328 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

RNA polymerase will bind to which region of promoter sequence

Options :

1. ✓ TATA

2. ✗ AATT

3. ✗ ATGC

4. ✗ TTAA

Question Number : 9 Question Id : 9003001329 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Transcription of Lac Operon genes in *E. coli* will take place only when the medium contains

Options :

1. ✗ Maltose

2. ✗ Glucose

3. ✗ Sucrose

4. ✓ Lactose

Question Number : 10 Question Id : 9003001330 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Name the elongation factor which helps in carrying the aminoacyl t-RNA to A site of ribosome

Options :

1. ✓ EF-Tu

2. ✗ EF-Ts

3. ✗ EF-G

4. ✗ EF-P

Question Number : 11 Question Id : 9003001331 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is an initiation codon

Options :

1. ✗ UAA

2. ✗ UAC

3. ✓ AUG

4. ✗ GAA

Question Number : 12 Question Id : 9003001332 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Sickle cell anemia is caused due to

Options :

1. ✗ Nonsense Mutation

2. ✓ Missense Mutation

3. ✗ Silent Mutation

4. ✗ Frameshift Mutation

Question Number : 13 Question Id : 9003001333 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Post translational modification of proteins in Eukaryotes take place in

Options :

1. ✗ Nucleus

2. ✗ Endoplasmic reticulum

3. ✓ Golgi apparatus

4. ✗ Mitochondria

Question Number : 14 Question Id : 9003001334 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Guanosine triphosphate capping of 5' terminal in mRNA is mediated by

Options :

1. ✗ Guanine-7-methyl transferase

2. ✓ Guanylyl transferase

3. ✗ Guanine transferase

4. ✗ S-Adensoyl methyl transferase

Question Number : 15 Question Id : 9003001335 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which one of the following techniques is used for the production of transgenic plants

Options :

1. ✗ Protoplast fusion technique

2. ✗ Anther culture technique

3. ✓ Biolistic transformation technique

4. ✖ Both 1 and 2

Question Number : 16 Question Id : 9003001336 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Phytohormone responsible for providing defense against pathogen attack

Options :

1. ✖ Auxin

2. ✖ Cytokinin

3. ✔ Abscisic acid

4. ✖ Gibberellins

Question Number : 17 Question Id : 9003001337 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Somatic embryogenesis is inhibited by the following phytohormone

Options :

1. ✖ Auxins

2. ✔ Ethylene

3. ✖ Cytokinin

4. ✖ Both 2 and 3

Question Number : 18 Question Id : 9003001338 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Isoquinoline alkaloids are the secondary metabolites produced by plants and are used as

Options :

1. ✗ Antibacterial agent

2. ✗ Antifungal agent

3. ✗ Antiviral agent

4. ✓ Both 1 and 2

Question Number : 19 Question Id : 9003001339 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Growth of suspension cell culture with rest to time is best described by

Options :

1. ✗ Hyperbolic curve

2. ✓ Sigmoidal curve

3. ✗ Linear curve

4. ✗ Parabolic curve

Question Number : 20 Question Id : 9003001340 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Transformed hairy roots are produced from explant by adding _____ to the medium

Options :

1. ✓ Agrobacterium rhizogenes

2. ✗ Agrobacterium rhizogenes + hormones

3. ✗ High Cytokinin + Low Auxin

4. ✗ Low Cytokinin + High Auxin

Question Number : 21 Question Id : 9003001341 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Taxol a plant product produced by *Taxus baccata* which is used in pharma industry as

Options :

1. ✗ Antibiotic

2. ✗ Anti-cholinergic

3. ✓ Anti-tumor

4. ✗ Anti-inflammatory

Question Number : 22 Question Id : 9003001342 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Fusion of nuclear genome of two parents produces

Options :

1. ✗ Cybrid

2. ✗ Hybrid

3. ✓ Symmetric hybrid

4. ✗ Asymmetric hybrid

Question Number : 23 Question Id : 9003001343 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

During *Agrobacterium* mediated gene transfer which Vir genes are vital in activation of virulence genes

Options :

1. ✓ Vir A & G

2. ✗ Vir B & C

3. ✗ Vir D & E

4. ✗ Vir C & E

Question Number : 24 Question Id : 9003001344 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Transformation of differentiated cells to undifferentiated cells is called as

Options :

1. ✗ Unipotent

2. ✓ Plasticity

3. ✗ Totipotent

4. ✗ Pluripotent

Question Number : 25 Question Id : 9003001345 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Exchange of genetic material between two bacterial species without physical contact is called

Options :

1. ✓ Transformation

2. ✗ Conjugation

3. ✗ Transduction

4. ✗ Translation

Question Number : 26 Question Id : 9003001346 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which one of the following is an example for rod shaped bacteria

Options :

1. ✗ Streptococcus

2. ✓ Lactobacillus

3. ✗ Vibrio

4. ✗ Spirillum

Question Number : 27 Question Id : 9003001347 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which component is present in eukaryotes and absent in prokaryotes

Options :

1. ✗ Cell membrane

2. ✓ Nucleus

3. ✗ Ribosomes

4. ✗ Both 1 and 3

Question Number : 28 Question Id : 9003001348 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which subcellular organelle is said to be the power house of cell

Options :

1. ✗ Ribosomes

2. ✗ Endoplasmic reticulum

3. ✗ Golgi bodies

4. ✓ Mitochondria

Question Number : 29 Question Id : 9003001349 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The example for symbiotic nitrogen fixing bacteria

Options :

1. ✓ Rhizobium

2. ✗ Azotobacter

3. ✗ Clostridium

4. ✗ Azospirillum

Question Number : 30 Question Id : 9003001350 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is true for anaerobic respiration

Options :

1. ✗ Occurs in presence of O_2; ATP production more

2. ✓ Occurs in the absence of O_2; ATP production less

3. ✗ Occurs in the absence of O_2; ATP production more

4. ✗ Occurs in presence of O_2; ATP production less

Question Number : 31 Question Id : 9003001351 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which one of the following is an example for spontaneous mutation

Options :

1. ✓ Deamination

2. ✗ Alkylation

3. ✗ UV light

4. ✗ Depurination

Question Number : 32 Question Id : 9003001352 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The given equation is an example for $C_6H_{12}O_6 + 6O_2 \longrightarrow 6CO_2 + 6H_2O + ATP$

Options :

1. ✗ Photosynthesis

2. ✓ Respiration

3. ✗ Both 1 and 2

4. ✗ Transpiration

Question Number : 33 Question Id : 9003001353 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which one of the following is not true about Lytic cycle

Options :

1. ✓ Viral DNA integrate into host DNA

2. ✗ Viral DNA does not integrate into host DNA

3. ✗ Host DNA is hydrolyzed

4. ✗ Absence of prophage

Question Number : 34 Question Id : 9003001354 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Microbes which are capable of growing either in presence or absence of oxygen are

Options :

1. ✗ Microaerophilic

2. ✗ Obligate anaerobe

3. ✓ Facultative anaerobe

4. ✗ Capnophilic

Question Number : 35 Question Id : 9003001355 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The total energy yield from one glucose molecule during Electron transport chain reaction is

Options :

1. ✓ 32

2. ✗ 30

3. ✗ 36

4. ✗ 34

Question Number : 36 Question Id : 9003001356 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the signaling molecule and the receptor are present far away from each other it is called as

Options :

1. ✗ Contact dependent signaling

2. ✗ Synaptic signaling

3. ✗ Autocrine signaling

4. ✓ Endocrine signaling

Question Number : 37 Question Id : 9003001357 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

During which phase of mitotic cell cycle sister chromatids separate to opposite sides of the cell

Options :

1. ✗ Prophase

2. ✗ Metaphase

3. ✓ Anaphase

4. ✗ Telophase

Question Number : 38 Question Id : 9003001358 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Tertiary structure of proteins involves

Options :

1. ✗ Sequence of a chain of amino acids

2. ✗ Hydrogen bonding of peptide backbone causing the amino acids to fold in to repeating pattern

3. ✓ Three-dimensional folding of protein due to side chain interactions

4. ✗ Proteins involving more than one amino acid chain

Question Number : 39 Question Id : 9003001359 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Enzymatic reaction involving in Non-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 : 40 Question Id : 9003001360 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Name the enzymatic reaction which involves the addition or removal of water, ammonia, or carbon dioxide to produce double bonds

Options :

1. ✗ Ligases

2. ✗ Isomerases

3. ✗ Hydrolases

4. ✓ Lyases

Question Number : 41 Question Id : 9003001361 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Secondary messenger involved in smooth muscle relaxation is

Options :

1. ✗ cAMP

2. ✓ cGMP

3. ✗ Calcium

4. ✗ Inositol triphosphate (IP3)

Question Number : 42 Question Id : 9003001362 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Role of P53 in cell cycle

Options :

1. ✗ Arrest cell cycle and promote repair

2. ✗ Promote Apoptosis

3. ✓ Both 1 and 2

4. ✗ Neither 1 nor 2

Question Number : 43 Question Id : 9003001363 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Movement of solvent molecules from high concentration to low concentration is called as

Options :

1. ✗ Diffusion

2. ✓ Osmosis

3. ✗ Transfusion

4. ✗ Absorption

Question Number : 44 Question Id : 9003001364 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Racial and Species immunity is part of

Options :

1. ✓ Innate Immunity

2. ✗ Acquired Immunity

3. ✗ Cell mediated Immunity

4. ✗ Humoral Immunity

Question Number : 45 Question Id : 9003001365 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Emil Von Behring is the scientist who proved the presence of

Options :

1. ✗ Toxins

2. ✓ Anti-toxins

3. ✗ Immune cells

4. ✗ Allergens

Question Number : 46 Question Id : 9003001366 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which one of the following is not the characteristic feature of active immunity

Options :

1. ✗ Memory

2. ✗ Secondary response

3. ✓ No lag phase

4. ✗ Long lived

Question Number : 47 Question Id : 9003001367 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which organ is considered as secondary lymphoid organ

Options :

1. ✗ Bone marrow

2. ✓ Spleen

3. ✗ Thymus

4. ✗ Both 1 and 3

Question Number : 48 Question Id : 9003001368 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which one of the following is not derived from Granulocyte progenitor cells

Options :

1. ✗ Mast Cells

2. ✗ Basophils

3. ✓ T Cells

4. ✗ Neutrophils

Question Number : 49 Question Id : 9003001369 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Humans blood groups (A, B, AB and O) are perfect examples for

Options :

1. ✗ Heterospecific antigen

2. ✗ Auto specific antigen

3. ✓ Iso specific antigen

4. ✗ Organ specific antigen

Question Number : 50 Question Id : 9003001370 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Hybridoma cells are screened using HATs medium because it contains

Options :

1. ✗ Hypoxanthine which blocks Denovo pathway for nucleotide synthesis

2. ✓ Aminopterin which blocks Denovo pathway for nucleotide synthesis

3. ✗ Hypoxanthine which blocks Salvage pathway for nucleotide synthesis

4. ✗ Aminopterin which blocks Salvage pathway for nucleotide synthesis

Question Number : 51 Question Id : 9003001371 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Antibody whose levels increases during allergic reactions in human body

Options :

1. ✗ Ig A

2. ✗ Ig G

3. ✗ Ig D

4. ✓ Ig E

Question Number : 52 Question Id : 9003001372 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Identification of small or soluble antigens with the help of IgG antibodies is called as

Options :

1. ✓ Co-agglutination

2. ✗ Passive agglutination

3. ✗ Hemagglutination

4. ✗ Bacterial agglutination

Question Number : 53 Question Id : 9003001373 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following hypersensitivity occurs via IgE antibody

Options :

1. ✗ Type II hypersensitivity

2. ✗ Type IV hypersensitivity

3. ✓ Type I hypersensitivity

4. ✗ Type III hypersensitivity

Question Number : 54 Question Id : 9003001374 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which one of the following statements is incorrect regarding Rheumatoid arthritis

Options :

1. ✗ It is an autoimmune disorder

2. ✓ It occurs only in old people

3. ✗ Inflammation of Synovial fluid

4. ✗ Diagnosed by the presence of rheumatoid factor

Question Number : 55 Question Id : 9003001375 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A DNA vaccine is

Options :

1. ✗ DNA molecule that is recognized by an antibody

2. ✗ A vaccine that works by stimulating the immune system to recognize pathogen DNA sequence

3. ✓ The DNA is expressed to produce a protein which stimulates an immune response

4. ✗ DNA is injected by macrophages to mount immune response

Question Number : 56 Question Id : 9003001376 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Restriction enzymes were discovered by

Options :

1. ✗ Alexander Fleming

2. ✓ Smith and Nathans

3. ✗ Watson and Crick

4. ✗ Meselson and Stahl

Question Number : 57 Question Id : 9003001377 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which bacteria is used in the production of insulin by genetic engineering approaches

Options :

1. ✗ Saccharomyces

2. ✓ Escherichia coli

3. ✗ Mycobacterium

4. ✗ Rhizobium

Question Number : 58 Question Id : 9003001378 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Genomic library can be prepared by

Options :

1. ✗ PCR technique

2. ✓ Shotgun experiment

3. ✗ Colony Hybridization

4. ✗ Both 1 and 2

Question Number : 59 Question Id : 9003001379 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Expression of a transgene in the target tissue is identified by a

Options :

1. ✗ Transgene

2. ✗ Promoter

3. ✗ Enhancer

4. ✓ Reporter

Question Number : 60 Question Id : 9003001380 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The first transgenic plant to be produced is

Options :

1. ✗ Brinjal

2. ✓ Tobacco

3. ✗ Rice

4. ✗ Cotton

Question Number : 61 Question Id : 9003001381 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Plasmids are used as cloning vector for which of the following reasons

Options :

1. ✗ Can be multiplied in culture

2. ✓ Self-replication in bacterial cells

3. ✗ Can be multiplied in lab with the help of enzymes

4. ✗ Replicate freely outside bacterial cells

Question Number : 62 Question Id : 9003001382 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The sites of DNA where restriction enzyme act is generally

Options :

1. ✓ Palindromic

2. ✗ Tandem repeats

3. ✗ CG rich regions

4. ✗ TATA boxes

Question Number : 63 Question Id : 9003001383 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The enzyme used in PCR technology is

Options :

1. ✗ RNA polymerase

2. ✓ Taq polymerase

3. ✗ Reverse transcriptase

4. ✗ Both 2 and 3

Question Number : 64 Question Id : 9003001384 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The most effective treatment for genetic disorder in the present times is

Options :

1. ✗ Gene mapping

2. ✗ Genetic counselling

3. ✓ Gene therapy

4. ✗ Cloning

Question Number : 65 Question Id : 9003001385 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Klenow fragment is derived from

Options :

1. ✗ DNA Ligase

2. ✓ DNA Polymerase-I

3. ✗ DNA Polymerase-II

4. ✗ Reverse Transcriptase

Question Number : 66 Question Id : 9003001386 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which type of restriction enzymes do not usually require ATP

Options :

1. ✗ Type I

2. ✓ Type II

3. ✗ Type III

4. ✗ Type IV

Question Number : 67 Question Id : 9003001387 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In the industrial production of streptomycin, the secondary metabolite or by products is

Options :

1. ✓ Vitamin-B12

2. ✗ Vitamin- E

3. ✗ Vitamin-C

4. ✗ Vitamin A

Question Number : 68 Question Id : 9003001388 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following detergent is commonly used to release integral proteins from its membrane

Options :

1. ✗ Urea

2. ✗ Dimethyl sulphoxide

3. ✓ Triton X 100

4. ✗ Cyanogen bromide

Question Number : 69 Question Id : 9003001389 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The immobilized enzyme produced by micro encapsulation technique provides

Options :

1. ✓ Extremely large surface area

2. ✗ Small surface area

3. ✗ No surface area

4. ✗ Average surface area

Question Number : 70 Question Id : 9003001390 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Monoclonal antibodies are produced by

Options :

1. ✗ Pure culture of cells producing antibodies

2. ✗ Recombinant DNA Technology

3. ✓ Somatic Hybridization Technology

4. ✗ DNA-RNA Hybridization

Question Number : 71 Question Id : 9003001391 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What is the driving force for Microfiltration and Dialysis

Options :

1. ✓ Pressure difference; Concentration difference

2. ✗ Concentration difference

3. ✗ Pressure difference

4. ✗ Concentration difference; Pressure difference

Question Number : 72 Question Id : 9003001392 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Cellulase is predominantly used in which type of industry

Options :

1. ✗ Food industry

2. ✗ Paper industry

3. ✗ Chemical industry

4. ✓ Biofuel industry

Question Number : 73 Question Id : 9003001393 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What is the starting point for selection of suitable ion exchange (IEX) matrix for purification of recombinant proteins

Options :

1. ✓ Prediction of isoelectric point (pI) from the amino acid sequence

2. ✗ Test protein binding to an IEX matrix at a range of pHs and salt concentration

3. ✗ Test protein binding to a selection of anion and cation exchange matrices

4. ✗ Pass your sample through a preparative column and elute with a salt gradient

Question Number : 74 Question Id : 9003001394 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Liquefaction of starch to dextrin is carried out by

Options :

1. ✓ α-amylase

2. ✗ Cellulase

3. ✗ Pectinase

4. ✗ Protease

Question Number : 75 Question Id : 9003001395 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Activated sludge process is an

Options :

1. ✗ Aerobic attached growth system

2. ✗ Anaerobic attached growth system

3. ✗ Anaerobic suspended growth system

4. ✓ Aerobic suspended growth system

Question Number : 76 Question Id : 9003001396 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Bioremediation technique which involves mixing contaminated water and soil, fertilizers and carbon dioxide in a bioreactor to stimulate biodegradation

Options :

1. ✗ Composting

2. ✓ Slurry-phase bioremediation

3. ✗ In situ hybridization

4. ✗ Biopile treatment

Question Number : 77 Question Id : 9003001397 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A process using microbes to convert toxic industrial wastes to less toxic or non-toxic compounds are termed as

Options :

1. ✗ Bioaugmentation

2. ✗ Bioconversion

3. ✓ Bioremediation

4. ✗ Bioleaching

Question Number : 78 Question Id : 9003001398 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Industrially Penicillin and Citric acid is produced by which fermentation process

Options :

1. ✓ Batch; Continuous fermentation

2. ✗ Continuous fermentation

3. ✗ Batch fermentation

4. ✗ Semi continuous fermentation

Question Number : 79 Question Id : 9003001399 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The term Bioinformatics was coined by

Options :

1. ✗ J.D Watson

2. ✗ Frederic Sanger

3. ✓ Pauline Hogeweg

4. ✗ Margret Dayhoff

Question Number : 80 Question Id : 9003001400 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which one of the following is not a benefit of BLAST

Options :

1. ✗ Speed

2. ✗ Statistical rigor

3. ✓ Handling of gaps

4. ✗ More sensitive

Question Number : 81 Question Id : 9003001401 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which one of the following is false about SCOP

Options :

1. ✗ Constructed almost entirely based on manual examination of protein structure

2. ✓ SCOP families consist of proteins having low sequence identity (>30%)

3. ✗ It is a database for comparing and classifying protein structures

4. ✗ The proteins are grouped into hierarchies of classes, folds, super families, and families

Question Number : 82 Question Id : 9003001402 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In pairwise energy-based method, a protein sequence is searched for in a structural fold database to find the best matching structural fold using_____ criteria

Options :

1. ✓ Energy-based

2. ✗ Residue-based

3. ✗ Structure-based

4. ✗ Sequence-based

Question Number : 83 Question Id : 9003001403 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is a nucleotide sequence data base

Options :

1. ✗ SWISS PROT

2. ✗ PROSITE

3. ✓ EMBL

4. ✗ TREMBL

Question Number : 84 Question Id : 9003001404 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time :

N.A Think Time : N.A Minimum Instruction Time : 0

Which one of the following is false about Homology modeling

Options :

1. ✓ It doesn't involve the evolutionary distances anywhere

2. ✗ It is also known as comparative modeling

3. ✗ Predicts protein structures based on sequence homology with known structures

4. ✗ If two proteins share a high sequence similarity, they likely have similar three- dimensional structures

Question Number : 85 Question Id : 9003001405 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The identification of drugs through genomic study is called as

Options :

1. ✗ Genomics

2. ✓ Pharmacogenomics

3. ✗ Pharmacogenetics

4. ✗ Cheminformatics

Question Number : 86 Question Id : 9003001406 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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 : 87 Question Id : 9003001407 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

BLOSUM matrices are used for

Options :

1. ✗ Multiple sequence alignment

2. ✓ Pair wise sequence alignment

3. ✗ Phylogenetic Analysis

4. ✗ Both 1 and 3

Question Number : 88 Question Id : 9003001408 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

An example of Homology and Similarity tool

Options :

1. ✗ PROSPECT

2. ✗ EMBOSS

3. ✓ BLAST

4. ✗ RASMOL

Question Number : 89 Question Id : 9003001409 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Culture freshly prepared from isolated tissue is known as

Options :

1. ✗ Organ culture

2. ✓ Primary culture

3. ✗ Cell line

4. ✗ Histotypic culture

Question Number : 90 Question Id : 9003001410 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The following are the routes of contamination in tissue culture laboratories except

Options :

1. ✗ Incubator

2. ✗ Refrigerator

3. ✗ Laminar flow hood

4. ✓ Autoclave

Question Number : 91 Question Id : 9003001411 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Toxicity due to accumulation of ammonia can be overcome by

Options :

1. ✗ Substituting glutamine by glutamate

2. ✗ Removal of ammonia or ammonium from culture medium

3. ✓ Both 1 and 2

4. ✗ By adding water

Question Number : 92 Question Id : 9003001412 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

When dissolved oxygen is lower than the critical concentration, viable cell concentration declines due to

Options :

1. ✗ Incomplete glutamine oxidation

2. ✗ Increase in specific lactate production from glucose

3. ✓ Both 1 and 2

4. ✗ Accumulation of ammonia

Question Number : 93 Question Id : 9003001413 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What is the main constituents of culture for animal cell growth

Options :

1. ✓ Glucose and Glutamine

2. ✗ Growth factors

3. ✗ Cytokines

4. ✗ Both 1 and 2

Question Number : 94 Question Id : 9003001414 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following human therapeutic proteins has been produced both in transgenic animals and transgenic plants

Options :

1. ✓ Somatotropin

2. ✗ Erythropoietin

3. ✗ Nerve growth factor

4. ✗ Insulin

Question Number : 95 Question Id : 9003001415 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time :

N.A Think Time : N.A Minimum Instruction Time : 0

Which one of the following is used for the preservation of animal cell lines

Options :

1. ✗ Glycerol

2. ✗ Ethanol

3. ✗ DMSO

4. ✓ Both 1 and 3

Question Number : 96 Question Id : 9003001416 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Cells which have undergone transformation frequently become

Options :

1. ✓ Anchorage independent

2. ✗ Anchorage dependent

3. ✗ Stable

4. ✗ Unstable

Question Number : 97 Question Id : 9003001417 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Rate kinetics observed in animal cell culture is

Options :

1. ✗ Zero order

2. ✓ First order

3. ✗ Second order

4. ✗ Both 1 and 3

Question Number : 98 Question Id : 9003001418 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following methods require initial creation of cell chimera for the production of transgenic mice

Options :

1. ✗ Pronuclear microinjection

2. ✗ Retroviral transduction

3. ✓ Transfection of Embryonic stem cells

4. ✗ Electroporation

Question Number : 99 Question Id : 9003001419 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The adoption of continuous culture is difficult for which type of systems

Options :

1. ✗ Microbial

2. ✓ Animal

3. ✖ Plant

4. ✖ Bacterial

Question Number : 100 Question Id : 9003001420 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Turn-over rate is high in which type of process

Options :

1. ✔ Continuous

2. ✖ Batch

3. ✖ Semi-batch

4. ✖ Semi-continuous

Question Number : 101 Question Id : 9003001421 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The yield factor (Y) does not vary upon which of the following

Options :

1. ✖ pH

2. ✖ Growth rate

3. ✖ Temperature

4. ✓ Amount of enzyme

Question Number : 102 Question Id : 9003001422 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What is Idiophase

Options :

1. ✗ Production of primary metabolites

2. ✓ Production of secondary metabolites

3. ✗ Production of tertiary metabolites

4. ✗ Production of quaternary metabolites

Question Number : 103 Question Id : 9003001423 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The pores of filter for filtration should be between in diameter is

Options :

1. ✗ 0.1 – 0.55 µm

2. ✓ 0.2 – 0.45 µm

3. ✗ 0.3 – 0.45 µm

4. ✗ 0.3 – 0.50 µm

Question Number : 104 Question Id : 9003001424 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What is the generation time if 100 bacterial cells growing logarithmically for 5 hours

produced 1.7×10^6 cells

Options :

1. ✗ 0.351 generations/Hour

2. ✗ 0.353 generations/Hour

3. ✗ 0.355 generations/Hour

4. ✓ 0.357 generations/Hour

Question Number : 105 Question Id : 9003001425 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A continuous reactor has a dilution rate of 0.5 h-1. Its residence time would be

Options :

1. ✗ ln (2)/0.5

2. ✗ ln (2) x 0.5

3. ✗ 0.5 h

4. ✓ 2 h

Question Number : 106 Question Id : 9003001426 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which order represents Michelis-Menten kinetics

Options :

1. ✗ First-Second order

2. ✓ Zero-First order

3. ✗ Zero-Second order

4. ✗ Second order

Question Number : 107 Question Id : 9003001427 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Catalytic efficiency is defined as

Options :

1. ✓ Kcat/Km

2. ✗ Km/Kcat

3. ✗ Km/K_0

4. ✗ Km/K_1

Question Number : 108 Question Id : 9003001428 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A chemostat has a liquid volume of 2 liters and is being fed at a rate of 4 liters per hour.
Dilution rate for this reactor will be

Options :

1. ✗ 2 Liters

2. ✗ 2 Liters per hour

3. ✓ 2 h-1

4. ✗ 4 Liters per hour

Question Number : 109 Question Id : 9003001429 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is used to calculate mass of substrate in the reactor

Options :

1. ✗ Flow rate x substrate concentration in the reactor

2. ✓ Volume of reactor x substrate concentration in reactor

3. ✗ Flow rate x mass of reactor

4. ✗ Volume of reactor x Flow rate

Question Number : 110 Question Id : 9003001430 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A fed-batch reactor initially contains 2 liters of medium. If it was fed at 1 liter per hour, then after 10 hours, the volume of the reactor will be

Options :

1. ✖ 1 Liter

2. ✔ 2 Liter

3. ✖ 3 Liter

4. ✖ 4 Liter

Question Number : 111 Question Id : 9003001431 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

$$\lim_{(x,y)\to(1,0)} \frac{(x-1)^2 \ln x}{(x-1)^2+y^2}$$

Options :

1. ✔ 0

2. ✖ 1

3. ✖ -1

4. ✖ Does not exist

Question Number : 112 Question Id : 9003001432 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following infinite series is convergent

Options :

1. ✗ $\sum\frac{1}{n}$

2. ✗ $\sum\frac{(2n)!}{n!n!}$

3. ✓ $\sum\frac{(-1)^{n+1}}{n}$

4. ✗ $\sum\frac{n+1}{n}$

Question Number : 113 Question Id : 9003001433 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Among all rectangular solids defined by inequalities $0 \leq x \leq a, 0 \leq y \leq a, 0 \leq z \leq 2$, the value of a for which flux, $F = x^2 i + y^2 j - z^2 k$ has the great outward value is

Options :

1. ✗ $\frac{1}{3}$

2. ✓ $\frac{2}{3}$

3. ✗ 1

4. ✗ 2

Question Number : 114 Question Id : 9003001434 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A letter is known to have come from either TATANAGAR or CALCUTTA. On the envelope, just two consecutive letters, TA are visible. The probability that the letter has come from CALCUTTA is

Options :

1. ✓ $\frac{4}{11}$

2. ✗ $\frac{3}{11}$

3. ✗ $\frac{2}{11}$

4. ✗ $\frac{1}{11}$

Question Number : 115 Question Id : 9003001435 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Let X be a normal random variable with mean μ and standard deviation σ. The value of $P[\mu - 2\sigma < X \leq \mu + 2\sigma]$ is approximately (use $\Phi(2) = 0.9772$ from standard normal table)

Options :

1. ✗ 99.7%

2. ✗ 68%

3. ✓ 95.5%

4. ✗ 99%

Question Number : 116 Question Id : 9003001436 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Let $A = \begin{bmatrix} 2 & -1 & 0 \\ -1 & 2 & -1 \\ 0 & -1 & 2 \end{bmatrix}$. The upper triangular matrix U in LU decomposition of $A = \begin{bmatrix} 1 & 0 & 0 \\ l_{21} & 1 & 0 \\ l_{31} & l_{32} & 1 \end{bmatrix} \begin{bmatrix} u_{11} & u_{12} & u_{13} \\ 0 & u_{22} & u_{23} \\ 0 & 0 & u_{33} \end{bmatrix}$ is

Options :

1. ✗ $\begin{bmatrix} 2 & -1 & 0 \\ 0 & \frac{3}{2} & -1 \\ 0 & 0 & -\frac{4}{3} \end{bmatrix}$

2. ✗ $\begin{bmatrix} 2 & -1 & 0 \\ 0 & -1 & \frac{3}{2} \\ 0 & 0 & \frac{4}{3} \end{bmatrix}$

3. ✓ $\begin{bmatrix} 2 & -1 & 0 \\ 0 & \frac{3}{2} & -1 \\ 0 & 0 & \frac{4}{3} \end{bmatrix}$

4. ✗ $\begin{bmatrix} 2 & -1 & 0 \\ 0 & -1 & \frac{3}{2} \\ 0 & 0 & -\frac{4}{3} \end{bmatrix}$

Question Number : 117 Question Id : 9003001437 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Second order convergent Newton's iteration to approximate the root 1 of $x^3 - x^2 - x + 1 = 0$ is

Options :

1. ✔ $x_{n+1} = x_n - 2\frac{x_n^3 - x_n^2 - x_n + 1}{3x_n^2 - 2x_n - 1}$

2. ✘ $x_{n+1} = x_n - \frac{x_n^3 - x_n^2 - x_n + 1}{3x_n^2 - 2x_n - 1}$

3. ✘ $x_{n+1} = x_n - 3\frac{x_n^3 - x_n^2 - x_n + 1}{3x_n^2 - 2x_n - 1}$

4. ✘ $x_{n+1} = x_n - 0.5\frac{x_n^3 - x_n^2 - x_n + 1}{3x_n^2 - 2x_n - 1}$

Question Number : 118 Question Id : 9003001438 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Solution of the initial value problem $\frac{d^2y}{dx^2} - 4\frac{dy}{dx} + 4y = 0; y(0) = 3, \frac{dy}{dx}(0) = 1$ at $x = 1$ is

Options :

1. ✘ -15.43

2. ✔ -14.77

3. ✘ 14.77

4. ✘ 15.43

Question Number : 119 Question Id : 9003001439 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The solution of $\frac{d^2y}{dx^2} + 4y = 4x; y(0) = 1, \frac{dy}{dx}(0) = 5$ in terms of inverse Laplace transform is

Options :

1. ✓ $L^{-1}\left[\frac{s}{s^2+4}\right] + L^{-1}\left[\frac{4}{s^2+4}\right] + L^{-1}\left[\frac{1}{s^2}\right]$

2. ✗ $L^{-1}\left[\frac{s}{s^2+4}\right] + L^{-1}\left[\frac{1}{s^2}\right]$

3. ✗ $L^{-1}\left[\frac{s}{s^2+4}\right] - L^{-1}\left[\frac{4}{s^2+4}\right]$

4. ✗ $L^{-1}\left[\frac{s}{s^2+4}\right] - L^{-1}\left[\frac{4}{s^2+4}\right] + L^{-1}\left[\frac{1}{s^2}\right]$

Question Number : 120 Question Id : 9003001440 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Let A be an $n \times n$ matrix and X be a $n \times 1$ vector. Then the system $AX = 0$

Options :

1. ✓ May not have a non-zero solution.

2. ✗ Always has a non-zero solution.

3. ✗ Always has at least 2 linearly independent solutions.

4. ✗ Always has at least n linearly independent solutions.