

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 30th May 2024 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 :	33300847
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
Is Section Default? :	null

Question Number : 1 Question Id : 3330085521 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 cells of the immune system do not perform phagocytosis?

Options :

1. ✘ Macrophage

2. ✘ Neutrophil

3. ✘ Eosinophil

4. ✔ Basophil

Question Number : 2 Question Id : 3330085522 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 cell organelle is present in animal cells and absent in plant cells?

Options :

1. ✘ Nucleus
2. ✔ Centrosome
3. ✘ Chloroplast
4. ✘ Endoplasmic reticulum

Question Number : 3 Question Id : 3330085523 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which regulatory body oversees the guidelines for mass cultivation of animal cell culture in the United States?

Options :

1. ✔ FDA (Food and Drug Administration)
2. ✘ WHO (World Health Organization)
3. ✘ EMA (European Medicines Agency)

4. ✘ USDA (United States Department Of Agriculture)

Question Number : 4 Question Id : 3330085524 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Name the cell which recruited first at the place of infection.

Options :

1. ✘ NK cells
2. ✘ Basophils
3. ✔ Neutrophils
4. ✘ Macrophages

Question Number : 5 Question Id : 3330085525 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Prostaglandins and leukotrienes are produced by

Options :

1. ✘ B cells
2. ✔ Mast cells

3. ✘ Macrophages

4. ✘ NK cells

Question Number : 6 Question Id : 3330085526 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The electron source for the Chemolithoheterotrophs type of microorganism is

Options :

1. ✘ Sunlight

2. ✘ CO₂

3. ✔ Reduced inorganic compounds

4. ✘ Organic carbon

Question Number : 7 Question Id : 3330085527 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Blue-white screening is performed to select _____ in vector-based molecular cloning

Options :

1. ✘ Vectors from plasmid

2. ✘ Gram-positive bacteria from Gram-negative bacteria
3. ✘ Antibiotic resistant bacteria
4. ✔ Recombinant bacteria from non-recombinant bacteria

Question Number : 8 Question Id : 3330085528 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 helps in opening of DNA double helix in front of replication fork?

Options :

1. ✘ Topoisomerase
2. ✘ DNA polymerase I
3. ✔ DNA gyrase
4. ✘ DNA ligase

Question Number : 9 Question Id : 3330085529 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Nitrogen is an essential component of

Options :

1. ✓ Proteins
2. ✗ Sugars
3. ✗ Carbohydrates
4. ✗ Lipids

Question Number : 10 Question Id : 3330085530 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which are the major modes of active transport?

Options :

1. ✓ Exocytosis, endocytosis and pumps
2. ✗ Simple diffusion, endocytosis and exocytosis
3. ✗ Simple diffusion, facilitated diffusion and osmosis
4. ✗ Exocytosis, endocytosis and osmosis

Question Number : 11 Question Id : 3330085531 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 primary role of shear forces in a stirred-tank bioreactor?

Options :

1. ✘ Enhance oxygen transfer to cells
2. ✘ Improve nutrient uptake by cells
3. ✘ Prevent cell aggregation
4. ✔ Damage cells and affect cell viability

Question Number : 12 Question Id : 3330085532 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The following process involves transferring naked DNA fragments from the surroundings into the bacteria

Options :

1. ✘ Transfection
2. ✔ Transformation
3. ✘ Transduction
4. ✘

✖ Conjugation

Question Number : 13 Question Id : 3330085533 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

_____ is stirred with sugar beet juice in batch stirred tank reactors to remove raffinose.

Options :

1. ✖ *Kluyveromyces lactis*
2. ✖ *Bacillus licheniformis*
3. ✔ *Mortierella vinacea*
4. ✖ *Bacillus acidopullulyticus*

Question Number : 14 Question Id : 3330085534 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A purified protein sample contains 10 μg of protein and has an enzyme activity of 1 m mole of ATP synthesized/sec (1 unit). What is the specific activity of the final purified sample?

Options :

1. ✖ 1,000 units/mg
- 2.

- ✘ 10,000 units/mg.
- 3. ✔ 100,000 units/mg
- 4. ✘ 1,000,000 units/mg

Question Number : 15 Question Id : 3330085535 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

_____ bacterium can withstand the dosage of radiation, which are several times higher than what human cells can tolerate.

Options :

- 1. ✘ *Escherichia coli*
- 2. ✘ *Conus magus*
- 3. ✔ *Deinococcus radiodurans*
- 4. ✘ *Staphylococcus aureus*

Question Number : 16 Question Id : 3330085536 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Gel permeation chromatography is based on

Options :

1. ✓ Size

2. ✗ Charge

3. ✗ Affinity

4. ✗ Sedimentation rate

Question Number : 17 Question Id : 3330085537 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The order for the construction of cDNA fragment from mRNA is to

Options :

1. ✓ bind oligo-dT, treatment with reverse transcriptase, digest with RNase, add G residues to the 3' end, bind oligo-dC, treat with DNA polymerase

2. ✗ treat with reverse transcriptase, digest with RNase, add G residues to the 3' end, bind oligo-dC, treat with DNA polymerase and bind oligo-dT

3. ✗ digest with RNase, add G residues to the 3' end, treat with reverse transcriptase, add G residues to the 3' end and treat with DNA polymerase

bind oligo-dC, treat with reverse transcriptase, digest with RNase, add G residues to the 3' end, bind oligo-dT and treat with DNA polymerase

4. ✘

Question Number : 18 Question Id : 3330085538 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

When populations are small, gene frequencies can change from generation to generation and some alleles may become fixed in a population. This is called _____

Options :

1. ✘ Assortative mating

2. ✘ Inbreeding

3. ✘ Heterosis

4. ✔ Genetic drift

Question Number : 19 Question Id : 3330085539 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which tool is utilized for motif identification?

Options :

1.

✘ BLAST

2. ✔ COPIA

3. ✘ PROSPECT

4. ✘ FASTA

Question Number : 20 Question Id : 3330085540 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 required for the development of B-cells in the bone marrow?

Options :

1. ✔ Stromal cells

2. ✘ Dendritic cells

3. ✘ Kupffer cells

4. ✘ NK cells

Question Number : 21 Question Id : 3330085541 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 untrue about Loop Modeling Step?

Options :

1. ✘ The gaps cannot be directly modeled
2. ✘ Loop modeling is required for closing the gaps
3. ✔ In the sequence alignment for modeling, there are no regions producing gaps in sequence alignment
4. ✘ In the sequence alignment for modeling, there are often regions caused by insertions and deletions producing gaps in sequence alignment

Question Number : 22 Question Id : 3330085542 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

With regard to the ABO blood group typing system, if a father is of blood group AB and a mother is of blood group O, what are the possible blood groups that a son of the couple have?

Options :

1. ✘ O only
2. ✔ Either A or B

3. ✘ AB only

4. ✘ AB, A, B, and O

Question Number : 23 Question Id : 3330085543 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Identify autoimmune disorder

Options :

1. ✘ Alzheimer's disease

2. ✔ Rheumatoid arthritis

3. ✘ Chronic gum disease

4. ✘ AIDS

Question Number : 24 Question Id : 3330085544 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 NOT correct about FASTA?

Options :

It was in fact the first database similarity search tool developed, preceding the development of BLAST

1. ✘
2. ✘ FASTA uses a 'hashing' strategy to find matches for a short stretch of identical residues with a length of k
3. ✔ The string of residues is known as blocks
4. ✘ Its stands for FAST ALL

Question Number : 25 Question Id : 3330085545 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 function of the lysozyme present in mucus?

Options :

1. ✔ Degrade bacterial peptidoglycan
2. ✘ Bind to iron
3. ✘ To generate toxics
4. ✘ Secretes an antibody

Question Number : 26 Question Id : 3330085546 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Antigen binding sites are present in _____

Options :

1. ✓ Fab regions of an antibody
2. ✗ Fc region of an antibody
3. ✗ Only in the light chain
4. ✗ Only in the heavy chain

Question Number : 27 Question Id : 3330085547 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Who is the Father of Microbiology?

Options :

1. ✗ Gregor Johann Mendel
2. ✗ Aristotle
3. ✓

Antonie van Leeuwenhoek

Louis Pasteur

4. ✘

Question Number : 28 Question Id : 3330085548 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The production of secondary metabolites requires the use of _____

Options :

1. ✘ Meristem tips

2. ✘ Protoplasts

3. ✘ Axillary buds

4. ✔ Cell suspensions

Question Number : 29 Question Id : 3330085549 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The average size of plant mitochondrial DNA range between _____ Kilo base pairs

Options :

1. ✘ 2 to 20
2. ✘ 20 to 200
3. ✔ 200 to 2000
4. ✘ 2000 to 20000

Question Number : 30 Question Id : 3330085550 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 technique is commonly used in animal cloning?

Options :

1. ✘ Polymerase Chain Reaction (PCR)
2. ✘ CRISPR-Cas9
3. ✔ Somatic Cell Nuclear Transfer (SCNT)
4. ✘ Gel Electrophoresis

Question Number : 31 Question Id : 3330085551 Display Question Number : Yes Is Question

Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The computational methodology that tries to find the best matching between two molecules, a receptor and a ligand are called

Options :

1. ✘ RASMOL
2. ✘ Molecular matching
3. ✘ Molecular modelling
4. ✔ Molecular docking

Question Number : 32 Question Id : 3330085552 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Sodium-Potassium pump present on the cell membrane is a classic example of _____

Options :

1. ✔ Primary active transport
2. ✘ Primary passive transport
3. ✘ Secondary active transport

Secondary passive transport

4. ✖

Question Number : 33 Question Id : 3330085553 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

_____ is NOT an indigenous microbe used for bioremediation

Options :

1. ✖ *Pseudomonas aeruginosa*

2. ✔ *Piscirickettsia salmonis*

3. ✖ *Phanerochaete sordida*

4. ✖ *E. coli*

Question Number : 34 Question Id : 3330085554 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Lack of independent assortment of two genes is due to

Options :

1. ✖ Recombination

2. ✖

Crossing over

3. ✓ Linkage

4. ✗ Repulsion

Question Number : 35 Question Id : 3330085555 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a batch process, 70 Kg of H_2O and 10 Kg of $NaOH$ and some other reactants enters the vessel, if 100 Kg of the product leaves the vessel, what is the percentage of H_2O in the product?

Options :

1. ✗ 10%

2. ✗ 30%

3. ✓ 70%

4. ✗ 100%

Question Number : 36 Question Id : 3330085556 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Cell division occurs in

Options :

1. ✘ S phase
2. ✘ G_1 phase
3. ✘ G_2 phase
4. ✔ M phase

Question Number : 37 Question Id : 3330085557 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Isoschizomers recognize

Options :

1. ✘ Same recognition sequence but different recognition site
2. ✔ Same recognition site and same recognition sequence
3. ✘ Same recognition site and different recognition sequence
4. ✘ Different recognition site and different recognition sequence

Question Number : 38 Question Id : 3330085558 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In which phase penicillin is produced?

Options :

1. ✘ Lag phase
2. ✘ Log phase
3. ✘ Exponential phase
4. ✔ Stationary phase

Question Number : 39 Question Id : 3330085559 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

All of the following interactions occur between antigen-antibody reaction except

Options :

1. ✘ Ionic bond
2. ✔ Covalent bond
3. ✘ Hydrogen bond

Vander waal force

4. ✖

Question Number : 40 Question Id : 3330085560 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

One of the following is NOT an antigen presenting cell

Options :

1. ✖ B cells

2. ✖ Dendritic cells

3. ✖ Macrophages

4. ✔ T cells

Question Number : 41 Question Id : 3330085561 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The melting temperature (T_m) of DNA is higher, when the content of

Options :

1. ✖ A: T base pair is lower

G:C base pair is lower

2. ✘

G:C base pair is higher

3. ✔

A: T base pair is higher

4. ✘

Question Number : 42 Question Id : 3330085562 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The batch fermentation can be used to produce

Options :

1. ✘ Organic acids

2. ✘ Amino acids

3. ✘ Single cell protein

4. ✔ Antibiotics

Question Number : 43 Question Id : 3330085563 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A living microbe with reduced virulence that is used for vaccination is considered as

Options :

1. ✘ A toxoid
2. ✘ Dormant
3. ✘ Virulent
4. ✔ Attenuated

Question Number : 44 Question Id : 3330085564 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In homology modelling the most suitable BLAST is

Options :

1. ✔ PSI-BLAST
2. ✘ PHI-BLAST
3. ✘ Geo BLAST
4. ✘ Rp BLAST

Question Number : 45 Question Id : 3330085565 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Genotype of dominant plant can be determined by

Options :

1. ✘ Pedigree analysis

2. ✘ Back cross

3. ✔ Test cross

4. ✘ Dihybrid cross

Question Number : 46 Question Id : 3330085566 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The presence of transposons can lead to genome instability due to their ability to cause _____

Options :

1. ✔ Gene disruption

2. ✘ Gene regulation

3.

Chromosome inversions

✘

4. ✘ DNA replication errors

Question Number : 47 Question Id : 3330085567 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

T cells and macrophages are involved in which type of hypersensitivity?

Options :

1. ✘ Type I

2. ✘ Type II

3. ✘ Type III

4. ✓ Type IV

Question Number : 48 Question Id : 3330085568 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Polymorphism in RAPD is observed because _____

Options :

1. ✘ DNA used is from different chromosomes of same species
2. ✘ DNA used is from same chromosomes of same species
3. ✔ DNA used is from different chromosomes of different species
4. ✘ DNA used is from complementary chromosomes of same species

Question Number : 49 Question Id : 3330085569 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 gas is produced in large amounts during sludge digestion?

Options :

1. ✔ Methane
2. ✘ Carbon dioxide
3. ✘ Hydrogen
4. ✘ Nitrogen

Question Number : 50 Question Id : 3330085570 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

_____ bacteria are cold loving and have optimal temperature for growth lower than 15°C .

Options :

1. ✘ Mesophilic
2. ✘ Thermophilic
3. ✔ Psychrophilic
4. ✘ Acidophilic

Question Number : 51 Question Id : 3330085571 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 about phosphodiester linkage?

Options :

1. ✘ 3'-phosphate group of one nucleotide unit is joined to the 5'-hydroxyl group of the next nucleotide
2. ✘ 3'-phosphate group of one nucleotide unit is joined to the 3'-hydroxyl group of the next nucleotide

5'-phosphate group of one nucleotide unit is joined to the 3'-hydroxyl group of the next nucleotide

3. ✓

5'-phosphate group of one nucleotide unit is joined to the 5'-hydroxyl group of the next nucleotide

4. ✗

Question Number : 52 Question Id : 3330085572 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 can be used to compare the expression of large number of genes in two biological samples in a single experiment?

Options :

Polymerase chain reaction

1. ✗

DNA microarray

2. ✓

Northern hybridization

3. ✗

Southern hybridization

4. ✗

Question Number : 53 Question Id : 3330085573 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which is the major factor(s) determining whether glucose is oxidized by aerobic or anaerobic glycolysis?

Options :

1. ✘ Presence of high AMP
2. ✔ NADH and the ATP/ADP ratio
3. ✘ Ca^{+2}
4. ✘ FADH_2

Question Number : 54 Question Id : 3330085574 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The best way to determine the location of protein in the purification scheme is to measure the

Options :

1. ✔ Rate of ATP synthesis
2. ✘ Changes in the refractive index
3. ✘ UV absorption

Mass spectroscopy of the protein

4. ✘

Question Number : 55 Question Id : 3330085575 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The reduction of NADP^+ to NADPH occurs in

Options :

1. ✓ HMP shunt

2. ✘ Calvin Cycle

3. ✘ Glycolysis

4. ✘ EMP (1988)

Question Number : 56 Question Id : 3330085576 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which is the first antibody produced in primary immune response

Options :

1. ✓ IgM

2. ✘

IgA

3. ✘ IgG

4. ✘ IgD

Question Number : 57 Question Id : 3330085577 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Saul Needleman and Christian Wansch postulated an algorithm which is useful for

Options :

1. ✘ Multiple sequence alignment

2. ✔ Global alignment of sequence

3. ✘ Local alignment of sequence

4. ✘ Progressive alignment

Question Number : 58 Question Id : 3330085578 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Parthenogenic embryos in plants are those which are formed by

Options :

1. ✓ Unfertilized eggs
2. ✗ Fertilized eggs
3. ✗ Sporophytic cells
4. ✗ Male gametophyte

Question Number : 59 Question Id : 3330085579 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) is the measure of the efficiency of _____

Options :

1. ✓ Conversion of anyone substrate into biomass
2. ✗ Conversion of all the substrates into biomass
3. ✗ The affinity of an enzyme to the substrate
4. ✗ Number of microbes which produced the biomass

Question Number : 60 Question Id : 3330085580 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 function of DNA is necessary for the purpose of evolution?

Options :

1. ✓ Mutation
2. ✗ Replication
3. ✗ Translation
4. ✗ Transcription

Question Number : 61 Question Id : 3330085581 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The enzymes required for the glycolysis pathway are localized in

Options :

1. ✗ Rough endoplasmic reticulum
2. ✗ Smooth endoplasmic reticulum

3. ✓ Cytoplasm

4. ✘ Mitochondria

Question Number : 62 Question Id : 3330085582 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

All of the following statements about hybridoma technology are true except

Options :

1. ✘ Specific antibody-producing cells are integrated with myeloma cells

2. ✓ Myeloma cells with mutation in salvage pathway grows well in HAT medium

3. ✘ Aminopterin, a folate antagonist, inhibits de-novo pathway

4. ✘ HGPRTase and thymidylate synthetase are required for the salvage pathway

Question Number : 63 Question Id : 3330085583 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The bench-top bioreactor comes under which type of bioreactor?

Options :

1. ✘ Solid-state bioreactor
2. ✘ Photo bioreactors
3. ✘ Airlift bioreactors
4. ✔ Stirred tank bioreactors

Question Number : 64 Question Id : 3330085584 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Cryoprotectants are used to _____ in cryopreservation.

Options :

1. ✔ Prevent ice formation
2. ✘ Increase ice formation
3. ✘ Increase the freezing temperature
4. ✘ Reduce the freezing temperature

Question Number : 65 Question Id : 3330085585 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 can NOT be a limiting substrate if Monod's growth kinetics is applicable?

Options :

1. ✘ Extracellular carbon source
2. ✘ Extracellular nitrogen source
3. ✘ Dissolved oxygen
4. ✔ Intracellular carbon source

Question Number : 66 Question Id : 3330085586 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 restriction enzyme produce blunt ends?

Options :

1. ✘ Sal I
2. ✔ Eco RV
- 3.

✘ Xho I

4. ✘ Hind III

Question Number : 67 Question Id : 3330085587 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The biomass concentration is at the highest level in which phase?

Options :

1. ✘ Lag phase

2. ✘ Log phase

3. ✓ Exponential phase

4. ✘ Stationary phase

Question Number : 68 Question Id : 3330085588 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 size of human genome

Options :

1.

- ✓ 3 billion base pairs
- 2. ✘ 2 billion base pairs
- 3. ✘ 4 billion base pairs
- 4. ✘ 6 trillion base pairs

Question Number : 69 Question Id : 3330085589 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The following bacterium is considered as natural genetic engineer

Options :

- 1. ✘ *E. coli*
- 2. ✘ *Pseudomonas aeruginosa*
- 3. ✓ *Agrobacterium tumefaciens*
- 4. ✘ *Xanthomonas axonopodis*

Question Number : 70 Question Id : 3330085590 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which is the first enzyme to be immobilized by adsorption method?

Options :

1. ✘ Protease

2. ✘ Glucose isomerase

3. ✔ Invertase

4. ✘ Amylase

Question Number : 71 Question Id : 3330085591 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Buffers are mixtures of a _____

Options :

1. ✘ Weak acid and weak base

2. ✔ Weak acid and their conjugate base

3. ✘ Strong base and their conjugate acid

4. ✘ Strong acid and weak base

Question Number : 72 Question Id : 3330085592 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

RNA interference helps in

Options :

1. ✘ Cell proliferation
2. ✘ Micropropagation
3. ✔ Cell defence
4. ✘ Cell differentiation

Question Number : 73 Question Id : 3330085593 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which among the following is a pathogenic alga for humans?

Options :

1. ✘ Cephaleuros
- 2.

✘ Acanthopeltis

3. ✘ Chlorella

4. ✔ Prototheca

Question Number : 74 Question Id : 3330085594 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 primary function of the protein collagen in the human body?

Options :

1. ✔ Structural support in connective tissues

2. ✘ Enzyme catalysis

3. ✘ Transport of oxygen in the blood

4. ✘ Muscle contraction

Question Number : 75 Question Id : 3330085595 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Match separation methods in Group I with associated properties in Group II.

GROUP-I	GROUP-II
A. Centrifugation	1. Density
B. Dialysis	2. Diffusivity
C. Solvent extraction	3. Size
D. Ultrafiltration	4. Solubility

Options :

1. ✖ A-4, B-2, C-1, D-3
2. ✖ A-3, B-1, C-2, D-4
3. ✖ A-1, B-3, C-2, D-4
4. ✔ A-1, B-2, C-4, D-3

Question Number : 76 Question Id : 3330085596 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Logistic growth model describes which type of growth

Options :

1. ✖ Product-based growth
2. ✖ Non-growth

3. ✓ Substrate-based growth

4. ✘ Maintenance-based growth

Question Number : 77 Question Id : 3330085597 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A culture vessel in which physical, physicochemical and physiological conditions, as well as cell concentration are kept constant is known as

Options :

1. ✘ Cell concentrator

2. ✓ Biostat

3. ✘ Batch bioreactor

4. ✘ Incubator

Question Number : 78 Question Id : 3330085598 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

How many molecules of ATP are required to fix one molecule of nitrogen?

Options :

1. ✘ 12

2. ✘ 20

3. ✘ 6

4. ✔ 16

Question Number : 79 Question Id : 3330085599 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 can be used as a measure to construct a linkage map of the Hfr chromosome?

Options :

1. ✘ Frequency of recombination

2. ✔ Time of entry

3. ✘ Locus of mutation

4. ✘ Transfer of F factor

Question Number : 80 Question Id : 3330085600 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Microtubules are composed of _____

Options :

1. ✓ Tubulin
2. ✗ Actin
3. ✗ Niacin
4. ✗ Myosin

Question Number : 81 Question Id : 3330085601 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of these would not be used to introduce DNA in animal cells?

Options :

1. ✗ Liposomes
2. ✗ Electroporation

3. ✘ Microinjection

4. ✔ Ti-plasmid

Question Number : 82 Question Id : 3330085602 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Where does respiration take place in woody plants?

Options :

1. ✘ Phloem tissue

2. ✘ Peripheral tissue

3. ✔ Lenticles

4. ✘ Xylem tissues

Question Number : 83 Question Id : 3330085603 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 signal molecule does not interact with cell surface receptors?

Options :

1. ✘ Insulin
2. ✘ Gastrin
3. ✘ Glucagon
4. ✔ Testosterone

Question Number : 84 Question Id : 3330085604 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which promoter is used for yeast cell expression

Options :

1. ✘ Polyhedrin
2. ✔ Alcohol oxidase
3. ✘ Cauliflower mosaic virus 35S
4. ✘ T7 polymerase

Question Number : 85 Question Id : 3330085605 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which is the source of energy used to make ATP by oxidative phosphorylation?

Options :

1. ✘ Oxygen
2. ✘ High-energy phosphate bonds
3. ✔ The proton motive force
4. ✘ Inorganic phosphate

Question Number : 86 Question Id : 3330085606 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 transcribes protein-coding genes in plants?

Options :

1. ✘ DNA polymerase II
2. ✘ DNA polymerase I
3. ✔

RNA polymerase II

4. ✘ RNA polymerase I

Question Number : 87 Question Id : 3330085607 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Error-free repair of double strand breaks in DNA is accomplished by

Options :

1. ✔ Non-homologous end-joining

2. ✘ Base excision repair

3. ✘ Non-homologous recombination

4. ✘ Mismatch repair

Question Number : 88 Question Id : 3330085608 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which part of the compound microscope helps in gathering and focusing light rays on the specimen to be viewed?

Options :

1. ✓ Condenser lens
2. ✘ Magnifying lens
3. ✘ Objective lens
4. ✘ Eyepiece lens

Question Number : 89 Question Id : 3330085609 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Histopathology deals with _____

Options :

1. ✘ Cells
2. ✓ Tissues
3. ✘ Muscles
4. ✘ Organs

Question Number : 90 Question Id : 3330085610 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which solution is used to maintain sterility in laboratories?

Options :

1. ✘ Sodium chloride
2. ✔ Sodium hypochlorite
3. ✘ Sodium cyanide
4. ✘ Sodium sulphate

Question Number : 91 Question Id : 3330085611 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Enzymes that remove nucleotides one at a time from the end of a DNA molecule are called __

Options :

1. ✘ Ligases
2. ✔ Exonucleases
3. ✘

Endonucleases

4. ✘ DNases

Question Number : 92 Question Id : 3330085612 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 NOT a thermostable polymerase?

Options :

1. ✘ pfu polymerase

2. ✘ Taq polymerase

3. ✘ Vent polymerase

4. ✔ DNA polymerase III

Question Number : 93 Question Id : 3330085613 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Cell theory was proposed by_____?

Options :

Theodor Schwann, Watson and Robert Hooke

1. ✘

Theodor Schwann, Matthias Schleiden and Robert Hooke

2. ✘

Theodor Schwann, Matthias Schleiden and Rudolf Virchow

3. ✔

Theodor Schwann, Rudolf Virchow and Robert Hooke

4. ✘

Question Number : 94 Question Id : 3330085614 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 polysaccharide is not present in the eukaryotic plant cell wall, it is ___

Options :

Chitin

1. ✔

Hemicellulose

2. ✘

Pectin

3. ✘

Cellulose

4. ✘

Question Number : 95 Question Id : 3330085615 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 cells are pluripotent?

Options :

1. ✓ Embryonic stem cells

2. ✘ Nucleosomes

3. ✘ Hepatocytes

4. ✘ Neurons

Question Number : 96 Question Id : 3330085616 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which leaching agent is used for the slow decomposition of refractory gold ores?

Options :

1. ✘ Nickel

2. ✘ Sulphur

3. ✓ Cyanide

4. ✘ Molybdenum

Question Number : 97 Question Id : 3330085617 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A colour-blind mother and normal father would have

Options :

1. ✘ Colour blind sons and daughters

2. ✓ Colour blind sons and normal/carrier daughters

3. ✘ All normal

4. ✘ All colour blind

Question Number : 98 Question Id : 3330085618 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

_____ enzyme that catalyses the transfer of the gamma-phosphate from ATP to the 5'-OH group of single- and double-stranded DNA, RNA, oligonucleotides, and nucleoside 3'- monophosphates.

Options :

1. ✓ T4 polynucleotide kinase
2. ✗ Endonuclease
3. ✗ Exonuclease
4. ✗ DNA ligase

Question Number : 99 Question Id : 3330085619 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 not the part of growth medium for animal cell culture

Options :

1. ✓ Starch
2. ✗ Serum
3. ✗ Carbon source

Inorganic salts

4. ✘

Question Number : 100 Question Id : 3330085620 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which technique is used to separate and analyze DNA fragments that are of different lengths?

Options :

1. ✓ Gel electrophoresis

2. ✘ DNA sequencing

3. ✘ Site-directed mutagenesis

4. ✘ Polymerase chain reaction (PCR)

Question Number : 101 Question Id : 3330085621 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

All the statements are true regarding RFLP and RAPD except

Options :

1. ✘ RAPD is a quick method compared to RFLP

2. ✘ RFLP is more reliable than RAPD
3. ✔ Species specific primers are required for RAPD
4. ✘ Radioactive probes are not required in RAPD

Question Number : 102 Question Id : 3330085622 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The correct order of taxonomic groups from higher to lower rank is?

Options :

1. ✘ Kingdom—Order—Class—Family- Division - Genus ---Species
2. ✘ Kingdom --Order—Class—Division—Family—Genus—Species
3. ✘ Kingdom—Order—Division—Family—Class—Genus—Species
4. ✔ Kingdom—Division—Class—Order—Family—Genus—Species

Question Number : 103 Question Id : 3330085623 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The process by which extracellular messages translate into intracellular changes is termed

Options :

1. ✘ Cell transport

2. ✘ Cell adhesion

3. ✔ Signal transduction

4. ✘ Cell transformation

Question Number : 104 Question Id : 3330085624 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Abscisic acid regulates _____

Options :

1. ✔ Wilting of leaves and seed dormancy

2. ✘ Cell division

3. ✘ Cell elongation and cell wall formation

4. ✘ Shoot elongation

Question Number : 105 Question Id : 3330085625 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Vero cell line is obtained from Kidney cells of

Options :

1. ✔ African green monkey

2. ✘ Chinese hamster

3. ✘ Calf

4. ✘ Swine

Question Number : 106 Question Id : 3330085626 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Phylogenetic relationships can be shown by

Options :

1. ✔ Dendrogram

2. ✘ Gene Bank

3. ✘ Data retrieving tool

4. ✘ Data search tool

Question Number : 107 Question Id : 3330085627 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Bacteriophages that can enter into stable, long-term relationships with their hosts are called

Options :

1. ✘ Lytic phages

2. ✘ Defective phages

3. ✘ Virulent phages

4. ✔ Temperate phages

Question Number : 108 Question Id : 3330085628 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For one of the following, recombinant vaccine is available in the market

Options :

1. ✓ Hepatitis B virus

2. ✗ Polio virus

3. ✗ Rubella virus

4. ✗ Dengue virus

Question Number : 109 Question Id : 3330085629 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The Following system has non-trivial solution $px + qy + rz = 0, qx + ry + pz = 0, rx + py + qz = 0$ then which one of the following is TRUE?

Options :

1. ✗ $p - q + r = 0$ or $p = q = -r$

2. ✗ $p + q - r = 0$ or $p = -q = r$

3. ✓ $p + q + r = 0$ or $p = q = r$

4.

$$p - q - r = 0 \text{ or } p = -q = -r$$

✘

Question Number : 110 Question Id : 3330085630 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If A is $\begin{bmatrix} 8 & 5 \\ 7 & 6 \end{bmatrix}$ then the value of $\det(A^{121} - A^{120}) = ?$

Options :

1. ✓ 0

2. ✘ 1

3. ✘ 120

4. ✘ 121

Question Number : 111 Question Id : 3330085631 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $A = \begin{bmatrix} 2 & 3 & 4 \\ 0 & 4 & 2 \\ 0 & 0 & 3 \end{bmatrix}$, then the eigenvalues of $\text{adj}(A)$

Options :

1. ✘ 12, 5, 3

2. ✔ 12, 6, 8

3. ✘ 10, 2, 3

4. ✘ 2, 3, 4

Question Number : 112 Question Id : 3330085632 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 square matrix of order m, then nullity of A is

Options :

1. ✘ $2 \text{ Rank of } [A] - m$

2. ✘ $m + \text{Rank of } [A]$

3. ✘ m

4. ✔ $m - \text{Rank of } [A]$

Question Number : 113 Question Id : 3330085633 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The function $(1 + \cos x)\sin x$ is maximum at

Options :

1. ✓ $x = \frac{\pi}{3}$

2. ✗ $x = \pi$

3. ✗ Both at $x = \frac{\pi}{3}$ and $x = \pi$

4. ✗ $x = 2\pi$

Question Number : 114 Question Id : 3330085634 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

$$\lim_{x \rightarrow \infty} \frac{\sin x}{x} =$$

Options :

1. ✗ 1

2. ✗

-1

3. ✘ ∞

4. ✔ zero

Question Number : 115 Question Id : 3330085635 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The integrating factor of equation $\sec^2 y \frac{dy}{dx} + x \tan y = x^3$ is

Options :

1. ✔ $e^{x^2/2}$

2. ✘ $e^{-x^2/2}$

3. ✘ $e^{x/2}$

4. ✘ $e^{-x/2}$

Question Number : 116 Question Id : 3330085636 Display Question Number : Yes Is Question

Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Consider the differential equation $\frac{dy}{dx} + ay = e^{-bt}$ with $y(0) = 0$. Then the Laplace transform of $y(t)$ is

Options :

1. ✓ $\frac{1}{(s+a)(s+b)}$

2. ✗ $\frac{1}{(s+a)b}$

3. ✗ $\frac{1}{a(s+b)}$

4. ✗ $\frac{e^{-a} - e^{-b}}{(b-a)}$

Question Number : 117 Question Id : 3330085637 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Let $u(x, t)$ satisfy the initial boundary value problem $\frac{\partial u}{\partial t} = \frac{\partial^2 u}{\partial x^2}$, $x \in (0, 1), t > 0$ given that $u(x, 0) = \sin \pi x, x \in [0, 1]$ and $u(0, t) = u(1, t) = 0, t > 0$. Then $u\left(x, \frac{1}{\pi^2}\right)$ for $x \in (0, 1)$

Options :

1. ✗ $e \sin(\pi x)$

2. ✓ $e^{-1} \sin(\pi x)$

3. ✗ $\sin(\pi x)$

4. ✗ $\sin(\pi^{-1} x)$

Question Number : 118 Question Id : 3330085638 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The standard deviation for the following frequency is

Class Interval	0-4	4-8	8-12	12-16
Frequency	4	8	2	1

Options :

1. ✗ 3.20

2. ✗ 3.22

3. ✓ 3.26

4. ✗ 3.28

Question Number : 119 Question Id : 3330085639 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The probability of getting 4 heads in 6 tosses of a fair coin is.

Options :

1. ✘ $\frac{2}{3}$

2. ✘ $\frac{1}{64}$

3. ✔ $\frac{15}{64}$

4. ✘ $\frac{3}{64}$

Question Number : 120 Question Id : 3330085640 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 differential equation $(D^2 + 9)y = \sin 2x$ is

Options :

1. ✔ $Y = a \cos 3x + b \sin 3x + \frac{1}{5} \sin 2x$

2. ✘ $Y = a \cos 9x + b \sin 9x + \frac{1}{5} \sin 2x$

3. ✘

$$Y = a \cos 3x + b \sin 3x + \frac{1}{5} \cos 2x$$

$$Y = a \cos 3x + b \sin 3x - \frac{1}{9} \sin 2x$$

4. ✖