Application No: **2**
Roll No:
Name:
Exam Date: **13-May-2023**
Exam Time: **09:00-12:00**
Examination: **1. Course Code -**
2. Field of Study -

Registered Photo Exa

Section A -

Question No.1 (Question Id - 11021)

The deficiency of which vitamin in the body causes Pernicious Anaemia?

1. Vitamin B_6
2. Vitamin B_1
3. Vitamin B_{12}
4. Vitamin B_2

○ 1
○ 2
○ 3
○ 4

Question No.2 (Question Id - 11014)

The S.I. unit of Luminous Intensity.

1. Joule
2. Watt
3. Mole
4. Candela

○ 1
○ 2
○ 3
○ 4

Question No.3 (Question Id - 11033)

Match **List - I** with **List - II**.

List - I	List - II
A. Restriction Enzymes	I. Recombinant protein
B. Microinjection	II. Molecular scissors
C. Biolistics	III. Animal cell
D. Heterologous host	IV. Gene gun

Choose the most appropriate match from the options given below:

1. A-II, B-III, C-IV, D-I
2. A-I, B-II, C-IV, D-III
3. A-IV, B-III, C-I, D-II
4. A-II, B-I, C-III, D-IV

○ 1
○ 2
○ 3
○ 4

Question No.4 (Question Id - 11013)

The gravitational force exerted by earth on a particle as it travels from the earth's surface towards the core

1. increases
2. is zero
3. decreases
4. remains same

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.5 (Question Id - 11006)

The electric field due to a dipole along the line passing through its midpoint and perpendicular to its axis is proportional to

1. $1/r^2$
2. $1/r^3$
3. $1/r$
4. r

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.6 (Question Id - 11050)

Ramesh has four friends. In how many ways can he invite one or more of them for dinner?

1. 15
2. 11
3. 16
4. 20

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.7 (Question Id - 11024)

Which of the following is not isoelectronic with Na^+?

1. O_2^-
2. Mg^{+2}
3. Al^{+3}
4. F^-

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.8 (Question Id - 11004)

The mean square speed ($<v^2>$) of the molecules of a gas at absolute temperature T is proportional to

1. $1/T$
2. $\sqrt{T}$
3. T
4. T^2

1
2
3
4

Question No.9 (Question Id - 11019)

Match **List - I** with **List - II**.

List - I	**List - II**
A. $Na_6P_6O_{18}$	I. Cellobiose
B. $C_{17}H_{35}COONa$	II. Cryolite
C. $C_{12}H_{22}O_{11}$	III. Calgon
D. Na_3AlF_6	IV. Soap

Choose the most appropriate match from the options given below:

1. A-III, B-II, C-I, D-IV
2. A-III, B-IV, C-I, D-II
3. A-III, B-II, C-IV, D-I
4. A-II, B-I, C-IV, D-III

1
2
3
4

Question No.10 (Question Id - 11046)

Which two gases together contribute maximally to global warming?

1. $CO_2 + N_2O$
2. $CH_4 + CFCs$
3. $CO_2 + CFCs$
4. $CO_2 + CH_4$

1
2
3
4

Question No.11 (Question Id - 11009)

A pseudoplastic fluid is best characterized by

1. Increase in apparent viscosity as the sheer rate increases
2. Decrease in apparent viscosity as the sheer rate increases
3. The structure breaks down and apparent viscosity decreases with continuous shear stress
4. The structure builds up and apparent viscosity decreases with continuous shear stress

1
2
3
4

Question No.12 (Question Id - 11039)

Which is the site of attachment of spindle fibres to chromosomes during metaphase of mitosis?

1. Kinetoplast of chromosomes
2. Kinetoplast and chromatid arms
3. Sister chromatids of chromosomes
4. Kinetochores of chromosomes

○ 1
○ 2
○ 3
○ 4

Question No.13 (Question Id - 11040)

The separation and purification of the biological product after completion of the biosynthetic stage in a bioprocess is known as

1. Downstream processing
2. Upstream processing
3. Quality control testing
4. Sample processing

○ 1
○ 2
○ 3
○ 4

Question No.14 (Question Id - 11052)

Pipe A can fill a tank three times faster than Pipe B. If together the two pipes can fill the tank in 36 minutes, then Pipe B alone will be able to fill the tank in

1. 81 minutes
2. 108 minutes
3. 144 minutes
4. 192 minutes

○ 1
○ 2
○ 3
○ 4

Question No.15 (Question Id - 11036)

Which one of the following is an autosomal dominant disorder?

1. Myotonic dystrophy
2. Phenylketonuria
3. Hemophilia
4. Thalassemia

○ 1
○ 2
○ 3
○ 4

Question No.16 (Question Id - 11037)

Identify the correct statement with respect to linkage and recombination frequency.

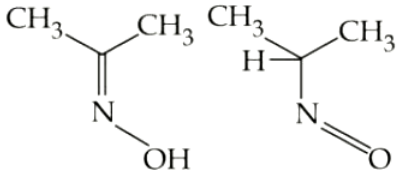
1. If the genes are loosely linked they show low recombination frequency
2. Two genes with 1.3 percent recombination frequency are loosely linked
3. If the genes are tightly linked they show high recombination frequency
4. If the genes are tightly linked they show low recombination frequency

○ 1
○ 2

○ 3
○ 4

Question No.17 (Question Id - 11028)

Consider the two compounds given below:



Which of the following best describes the relationship between them?

1. Resonance structures
2. Positional isomers
3. Functional isomers
4. Tautomers

○ 1
○ 2
○ 3
○ 4

Question No.18 (Question Id - 11042)

Plants which are genetically identical to the original plant from which they are grown are called as

1. Somatic hybrids
2. Somaclones
3. Single cell explants
4. Homozygous twins

○ 1
○ 2
○ 3
○ 4

Question No.19 (Question Id - 11034)

Match **List - I** with **List - II**.

List - I	List - II
A. Euchromatin	I. Densely packed DNA
B. Heterochromatin	II. RNA degradation
C. RNA	III. Transcriptionally active
D. RNAse	IV. Poliovirus Genome

Choose the most appropriate match from the options given below:

1. A-III, B-I, C-IV, D-II
2. A-I, B-II, C-IV, D-III
3. A-III, B-I, C-II, D-IV
4. A-IV, B-I, C-II, D-III

○ 1
○ 2
○ 3
○ 4

Question No.20 (Question Id - 11005)

Two sources are called coherent if they produce waves

1. of equal wavelength
2. of equal velocity
3. having a constant phase difference
4. having same shape of wavefront

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.21 (Question Id - 11025)

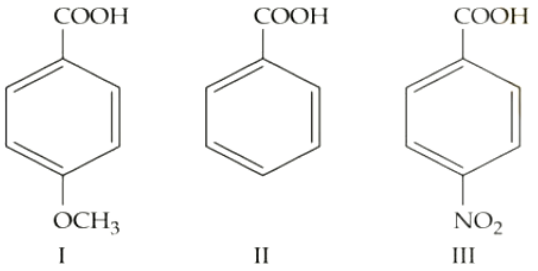
Calculate the molality of 3.0 g acetic acid in 100 g of benzene.

1. 0.05 mol kg^{-1}
2. 0.5 mol kg^{-1}
3. 2.0 mol kg^{-1}
4. 0.2 mol kg^{-1}

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.22 (Question Id - 11023)

What will be the order of acidity of the following acids, starting with the highest?



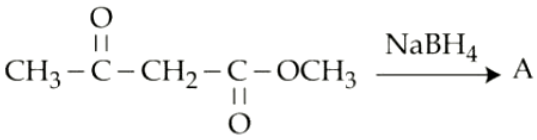
I II III

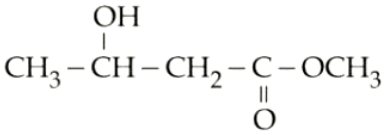
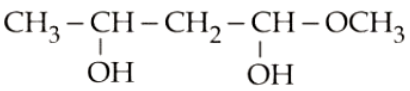
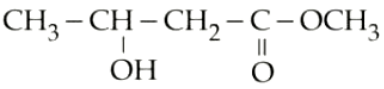
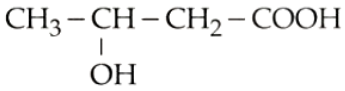
1. I > II > III
2. II > I > III
3. I = III > II
4. III > II > I

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.23 (Question Id - 11030)

Identify A in the following reaction:



1. 
2. 
3. 
4. 

- 1
- 2
- 3
- 4

Question No.24 (Question Id - 11010)

A wedge of 60° representing one sixth portion of a circular disc of mass M and radius R is cut. It is rotated about a line perpendicular to its plane and passing through the centre of the original disc. Its momentum of inertia about the axis of rotation is:

1. $1/2\ MR^2$
2. $1/8\ MR^2$
3. $\sqrt{2}\ MR^2$
4. $1/12\ MR^2$

- 1
- 2
- 3
- 4

Question No.25 (Question Id - 11049)

Triangle ABC is a right angled triangle, right angled at B. If lengths of AB and BC are 60 cm and 80 cm respectively, and BD is an altitude of triangle ABC, then find the length of AD in cm.

1. 34
2. 36
3. 40
4. 42

- 1
- 2
- 3

○ 4

Question No.26 (Question Id - 11031)

Match **List - I** with **List - II**.

List - I	List - II
A. Amylose	I. 2 units of α-D-glucose
B. Glycogen	II. α -D-glucose + ß-D-fructose
C. Maltose	III. Animal starch
D. Sucrose	IV. Plant starch

Choose the **correct** answer from the options given below:

1. A-IV, B-III, C-I, D-II
2. A-IV, B-I, C-II, D-III
3. A-III, B-II, C-I, D-IV
4. A-III, B-I, C-II, D-IV

○ 1
○ 2
○ 3
○ 4

Question No.27 (Question Id - 11011)

Half-life ($T_{½}$)of a radioisotope is related to decay constant (λ):

1. $T_{½} = 0.693/\lambda$
2. $T_{½} = e^{-\lambda}$
3. $T_{½} = -\lambda N dt$
4. $T_{½} = -\lambda e^{-c}$

○ 1
○ 2
○ 3
○ 4

Question No.28 (Question Id - 11056)

A basket contains 4 red, 5 blue and 3 green marbles. If 3 marbles are picked at random, what is the probability that either all are green or all are red?

1. 7/44
2. 7/12
3. 5/12
4. 1/44

○ 1
○ 2
○ 3
○ 4

Question No.29 (Question Id - 11038)

Given below are two statements: one is labelled as **Assertion (A)** and the other is labelled as **Reason (R)**.

Assertion (A): Morgan observed that the Drosophila genes for yellow body and white eye showed 1.3 percent recombination frequency.

Reason (R): Stritevant used the frequency of recombination between gene pairs on the same chromosome as a measure of the distance between genes.

In the light of the above statements, choose the **most appropriate** answer from the options given below:

1. Both **A** and **R** are correct and **R** is the correct explanation of **A**
2. Both **A** and **R** are correct but **R** is not the correct explanation of **A**
3. **A** is correct but **R** is not correct
4. **A** is not correct but **R** is correct

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.30 (Question Id - 11007)

A satellite is revolving around the Earth at some height (h). If R is the radius of orbit, then the time period of satellite is proportional to

1. $(R+h)^{3}$
2. $(R+h)^{3/2}$
3. $(R+h)^{5/2}$
4. $(R+h)^{6}$

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.31 (Question Id - 11045)

Which of the following is NOT a secondary lymphoid organ?

1. Lymph nodes
2. Spleen
3. Peyer's patches
4. Bone Marrow

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.32 (Question Id - 11003)

Which one of the following is the working principle behind optical fibers?

1. Reflection
2. Refraction
3. Diffraction
4. Total internal reflection

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.33 (Question Id - 11048)

The perimeter of the top of a rectangular table is 28 m, whereas its area is 48 m^2. What is the length of its diagonal?

1. 5 m
2. 10 m
3. 12 m
4. 12.5 m

○ 1
○ 2
○ 3
○ 4

Question No.34 (Question Id - 11047)

The ratio of the incomes of two persons is 9:7 and the ratio of their expenditure is 4:3. If each of them manages to save Rs. 2000/- per month, find their monthly income.

1. 9,000/- & 7,000/-
2. 10,500/- & 13,500/-
3. 10,800/- & 8,400/-
4. 18,000/- & 14,000/-

○ 1
○ 2
○ 3
○ 4

Question No.35 (Question Id - 11058)

A fraction becomes 9/11 if 2 is added to both the numerator & the denominator. If 3 is added to both the numerator and denominator, the fraction becomes 5/6. Find the fraction.

1. 7/9
2. 2/3
3. 7/11
4. 8/9

○ 1
○ 2
○ 3
○ 4

Question No.36 (Question Id - 11002)

The potential energy U(r)of two point charges at a distance of r is proportional to

1. -1/r
2. $1/r^2$
3. $1/r^3$
4. 1/r

○ 1
○ 2
○ 3
○ 4

Question No.37 (Question Id - 11001)

What type of modulation is used in television transmission?

1. amplitude modulation
2. frequency modulation
3. both amplitude and frequency modulation
4. no modulation is required

○ 1
○ 2
○ 3
○ 4

Question No.38 (Question Id - 11017)

Which of the following alloys do NOT have copper as one of the constituent metal?

1. Brass
2. German Silver
3. Bronze
4. Solder

○ 1
○ 2
○ 3
○ 4

Question No.39 (Question Id - 11018)

Which of the following is a component of smoke screens?

1. Phosphine
2. Calcium carbide
3. Copper phosphide
4. Calcium phosphate

○ 1
○ 2
○ 3
○ 4

Question No.40 (Question Id - 11059)

A 10m long ladder reaches a window 8 m above the ground. Find the distance of the ladder from the base of the wall.

1. 7 m
2. 6 m
3. 10 m
4. 5 m

○ 1
○ 2
○ 3
○ 4

Question No.41 (Question Id - 11057)

Which of the following represents the equation of a straight line passing through origin?

1. 2x-3y=0
2. 5x-4=0
3. 2y-13=0
4. x+2y+9=0

○ 1
○ 2

○ 3
○ 4

Question No.42 (Question Id - 11008)

The moment of inertia of a uniform hollow sphere about it's diameter is

1. MR^2
2. $MR^2/2$
3. $2/3\ MR^2$
4. $3/2\ MR^2$

○ 1
○ 2
○ 3
○ 4

Question No.43 (Question Id - 11044)

Find the least number which when divided by 16, 18, 20 and 25 leaves 4 as remainder in each case but when divided by 7 leaves no remainder.

1. 8004
2. 13004
3. 18004
4. 18014

○ 1
○ 2
○ 3
○ 4

Question No.44 (Question Id - 11015)

To obtain p-type Si semiconductor, we need to dope pure Si with

1. Oxygen
2. Aluminium
3. Phosphorous
4. Germanium

○ 1
○ 2
○ 3
○ 4

Question No.45 (Question Id - 11054)

Which two operation signs need to be interchanged to make the following equation correct?

73 - 13 X 42 ÷ 14 + 56 = 56

1. + and X
2. X and ÷
3. - and +
4. - and X

○ 1
○ 2
○ 3
○ 4

Question No.46 (Question Id - 11016)

Blister copper is given its name because of the evolution of

1. H_2
2. CO_2
3. SO_2
4. Cl_2

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.47 (Question Id - 11032)

What is Totipotency?

1. The capacity to generate a whole seed from any cell or explant.
2. The capacity to generate plants with higher levels of vitamins and healthier fats.
3. The capacity to generate somatic hybrids from the naked protoplasts of two different cells.
4. The capacity to generate a whole plant from any cell or explant.

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.48 (Question Id - 11029)

The conversion of FAD to $FADH_2$ is a

1. One-step process with radical intermediates
2. Two-step process with ionic intermediates
3. Two-step process with radical intermediates
4. One-step process with ionic intermediates

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.49 (Question Id - 11022)

In areas with low air pollution, rain water generally has a pH of ~5-6 because of

1. H_2SO_4
2. H_2CO_3
3. HNO_3
4. HNO_2

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.50 (Question Id - 11041)

How are healthy plants recovered from diseased plants using plant tissue culture?

1. By growing floral buds of diseased plants *in vitro*
2. By growing leaf epidermis of diseased plants *in vitro*
3. By growing apical and axillary meristem of diseased plant *in vitro*
4. By growing phloem parenchyma cells of diseased plant *in vitro*

- ○ 1

○ 2
○ 3
○ 4

Question No.51 (Question Id - 11051)

Robin could get equal number of Rs. 55, Rs. 85 and Rs. 105 category tickets for a movie. He spent Rs. 2940 for all the tickets. How many tickets of each category did he buy?

1. 12
2. 14
3. 16
4. 11

○ 1
○ 2
○ 3
○ 4

Question No.52 (Question Id - 11055)

A man spends 75% of his income. If his income increases by 20% and his expenditure increases by 10%, then the percentage of increase in his saving would be

1. 40%
2. 30%
3. 50%
4. 25%

○ 1
○ 2
○ 3
○ 4

Question No.53 (Question Id - 11020)

The reaction between sodium hydroxide and ester of fatty acid is

1. Esterification
2. Pyrophosphorolysis
3. Saponification
4. Neutralization reaction

○ 1
○ 2
○ 3
○ 4

Question No.54 (Question Id - 11035)

Match **List - I** with **List - II**.

List - I	**List - II**
A. Thalassemia	I. 44 +XXY chromosomes
B. Turner's Syndrome	II. 45 + XX chromosomes
C. Klinefelter's Syndrome	III. 44 +XO chromosomes
D. Down's Syndrome	IV. Autosomal recessive

Choose the most appropriate match from the options given below:

1. A-IV, B-III, C-I, D-II
2. A-I, B-III, C-II, D-I
3. A-II, B-IV, C-II, D-I
4. A-IV, B-II, C-III, D-I

○ 1
○ 2
○ 3
○ 4

Question No.55 (Question Id - 11053)

Rohit has some hens and some goats. If the total number of animals is 90 and the total number of animal feet is 248. What is the total number of goats Rohit has?

1. 32
2. 36
3. 34
4. 30

○ 1
○ 2
○ 3
○ 4

Question No.56 (Question Id - 11027)

The reactive functional group in coenzyme Q is

1. ester
2. carboxylic acid
3. ketone
4. thioester

○ 1
○ 2
○ 3
○ 4

Question No.57 (Question Id - 11060)

Two fair cubical dice with faces numbered from 1 to 6 are rolled. What is the probability that the sum of the numbers on the two faces that appear on the top is 8, given that each of the two faces that appear on the top shows an odd number?

1. 1/18
2. 2/9
3. 5/36
4. 1/9

○ 1
○ 2
○ 3
○ 4

Question No.58 (Question Id - 11043)

Drosophila melanogaster is suitable for genetic studies because

A. male and female flies are easily distinguishable
B. the life cycle is completed in about three weeks
C. a single mating produces large progeny
D. phenotypic variations can be seen with low magnification microscope

Choose the **correct** answer from the options given below:

1. A and B only
2. C and D only
3. A, C and D only
4. B, C and D only

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.59 (Question Id - 11026)

You are supplied with a pain-relieving drug (MW 300) formulation at 5mg/ml. A patient with a plasma volume of 2.5 L needs an initial dose of 20µM for immediate relief. How much solution do you need to inject to the patient?

1. 1 ml
2. 2 ml
3. 3 ml
4. 4 ml

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.60 (Question Id - 11012)

Which of the following are not electromagnetic waves?

1. Cosmic ray
2. X-ray
3. ß-ray
4. α-ray

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Section B -

Question No.1 (Question Id - 11062)

Which of the following is NOT a preparative purification method for recovering protein product after fermentation?

1. Gel filtration chromatography
2. Ion exchange chromatography
3. Thin Layer chromatography
4. Affinity chromatography

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.2 (Question Id - 11072)

Match List I with List II

Retrotransposons category	Examples
A. LTR, autonomous	I. *Dasheng*
B. Non-LTR, autonomous	II. *Alu*
C. LTR, non-autonomous	III. copia
D. Non-LTR, non-autonomous	IV. *I* factor

Choose the correct answer from the options given below:

1. A-II, B-III, C-IV, D-I
2. A-III, B-IV, C-I, D-II
3. A-IV, B-I, C-II, D-III
4. A-III, B-II, C-I, D-IV

○ 1
○ 2
○ 3
○ 4

Question No.3 (Question Id - 11136)

Which is NOT a part of mandatory design considerations of a Rotating Biological Contactor (RBC) system?

1. Staging of the RBC units and Secondary clarifier design
2. Loading criteria
3. Effluent characteristics
4. Rotation speed

○ 1
○ 2
○ 3
○ 4

Question No.4 (Question Id - 11156)

Which one of the following conditions would, in general, be more conducive for the production of roots from callus tissue of plants under *in vitro* conditions?

1. Higher cytokinin/auxin ratio
2. Higher auxin/cytokinin ratio
3. Lower auxin/cytokinin ratio
4. Removal of both auxin and cytokinin from the medium

○ 1
○ 2
○ 3
○ 4

Question No.5 (Question Id - 11132)

BCG vaccine is an example of

1. Live attenuated vaccine
2. Heat killed vaccine
3. Recombinant vaccine
4. Subunit vaccine

○ 1
○ 2
○ 3
○ 4

Question No.6 (Question Id - 11128)

Which of the following antibody is used by immune complexes for complement activation?

1. IgA
2. IgM
3. IgE
4. IgD

○ 1
○ 2
○ 3
○ 4

Question No.7 (Question Id - 11158)

The first clinical use of gene therapy was done for treatment of

1. Peptide deaminase deficiency
2. Adenosine deaminase deficiency
3. Cytosine decarboxylate deficiency
4. Adenosine demethylase deficiency

○ 1
○ 2
○ 3
○ 4

Question No.8 (Question Id - 11103)

Which of the following is true for the free-energy change of a reaction (ΔG) catalyzed by an enzyme?

1. A reaction can take place spontaneously only if ΔG is negative.
2. In a system at equilibrium, there is a net change in the concentrations of the products and reactants and ΔG is positive.
3. The ΔG of a reaction is dependent of the path of the transformation.
4. The ΔG provides information about the rate of a reaction.

○ 1
○ 2
○ 3
○ 4

Question No.9 (Question Id - 11110)

Which of the following bioprocess would yield maximum number of ATP per gram of the substrate consumed?

1. Anaerobic catabolism of amylose
2. Aerobic catabolism of glucose
3. Aerobic catabolism of methanol
4. Aerobic catabolism of acetate

○ 1
○ 2
○ 3
○ 4

Question No.10 (Question Id - 11096)

The purity of a plasmid DNA preparation is determined by analyzing the ratio A_{260}/A_{280}. In a pure DNA preparation, the ratio will be

1. close to 2
2. close to 1
3. less than 1
4. equal to 1

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.11 (Question Id - 11146)

Which of the following is an RNA virus?

1. Dengue virus
2. Small pox virus
3. Human Papilloma virus
4. Hepatitis B Virus

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.12 (Question Id - 11083)

Which of the following is NOT a PCR based method?

1. Selective Amplification of Microsatellite Polymorphic Loci (SAMPL)
2. Sequence Tagged Site (STS) Amplification
3. Random Amplification of Polymorphic DNA (RAPD)
4. Restriction Fragment Length Polymorphism (RFLP)

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.13 (Question Id - 11135)

Which of the following is normally used to determine the frequency of interferon gamma producing cells in a blood sample?

1. ELISPOT
2. ELISA
3. Immunoprecipitation
4. Confocal microscopy

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.14 (Question Id - 11134)

Which of the following is the least abundant immunoglobulin class in a normal adult?

1. IgG
2. IgE
3. IgM
4. IgA

○ 1
○ 2
○ 3
○ 4

Question No.15 (Question Id - 11086)

In which stage of HIV infection does one usually show symptoms of AIDS:

1. Within 15 days of sexual contact with an infected person
2. When the infected retrovirus enters the host cell
3. When HIV damages a large number of helper T-Lymphocytes
4. When the viral DNA is produced by reverse transcriptase

○ 1
○ 2
○ 3
○ 4

Question No.16 (Question Id - 11098)

Information about the isoelectric point will be useful in the purification of a protein by which of the following chromatography techniques?

1. Gel Filtration chromatography
2. Ion exchange chromatography
3. Reverse phase chromatography
4. Hydrophobic interaction chromatography

○ 1
○ 2
○ 3
○ 4

Question No.17 (Question Id - 11125)

Intine, the inner wall of pollen grain is made up of

1. Cellulose and Pectin
2. Cellulose and Lignin
3. Pectin and Sporopollenin
4. Sporopollenin and Cellulose

○ 1
○ 2
○ 3
○ 4

Question No.18 (Question Id - 11069)

Match List I with List II

List I	List II
A. IgM	I. Monomer; Mast Cell activation
B. IgA	II. Naïve B cell antigen receptor
C. IgD	III. Monomer/Dimer/Trimer; Mucosal Immunity
D. IgE	IV. Pentamer; Complement Activation

Choose the correct answer from the options given below:

1. A- III, B- I, C- II, D-IV
2. A- IV, B- II, C- III, D- I
3. A- II, B- III, C- IV, D- I
4. A- IV, B- III, C- II, D- I

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.19 (Question Id - 11160)

Which of the following can be used for cell-line authentication?

1. Serotyping
2. Virus infection
3. PCR
4. Protein estimation

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.20 (Question Id - 11091)

EST stands for

1. Eukaryotic Sequencing Technology
2. Expressed Sequence Tag
3. Eukaryotic Sequence Test
4. Eukaryotic Sequence Tag

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.21 (Question Id - 11093)

logP is a measure of drug-likeliness in Lipinsky's Rule of Five. P denotes

1. partition coefficient
2. polymer concentration
3. plasma coefficient
4. pyrogen concentration

○ 1
○ 2
○ 3
○ 4

Question No.22 (Question Id - 11107)

The equilibrium sedimentation experiments performed by Meselson and Stahl in 1957 demonstrated that

1. DNA replication takes place in a semiconservative fashion
2. DNA is double stranded
3. DNA chains are antiparallel
4. The nucleotides in DNA contain sugar

○ 1
○ 2
○ 3
○ 4

Question No.23 (Question Id - 11111)

The theoretical RQ (respiratory quotient) for the complete oxidation of pyruvic acid will be

1. 1.2
2. 0.6
3. 0.8
4. 1.0

○ 1
○ 2
○ 3
○ 4

Question No.24 (Question Id - 11115)

Which of the following biochemical techniques does not use antibody?

1. ELISA
2. Western blotting
3. Isoelectric focusing
4. Immuno-affinity chromatography

○ 1
○ 2
○ 3
○ 4

Question No.25 (Question Id - 11147)

Which of these viruses make use of RNA-dependent DNA polymerase during replication?

1. HIV
2. Dengue virus
3. Polio virus
4. Hepatitis E virus

○ 1
○ 2
○ 3
○ 4

Question No.26 (Question Id - 11064)

Which of the following is a bacteria known for high yield of ethanol production?

1. *Saccharomyces cerevisiae*
2. *Pseudomonas aeruginosa*
3. *Zymomonas mobilis*
4. *Acetobacter aceti*

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.27 (Question Id - 11137)

Which of the following is NOT an example of bioremediation?

1. Cleaning of oil spills by *Pseudomonas putida*
2. Decomposition of DDT by *Acetobacter aerogenus*
3. Removal of metal pollutants by *Pseudomonas* species
4. Depletion of ozone by *Aspergillus niger*

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.28 (Question Id - 11073)

Which of the following statement is NOT true about the seed culture of Orchids?

1. They grow on salt poor medium as mineral requirement is low
2. Protocorm like structure is formed from the embryo
3. Seeds are very small and contain little or no food reserve
4. *In vitro* germination and development is very slow in Orchids

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.29 (Question Id - 11159)

Which of the following is best suited to express large amount of glycosylated protein?

1. *E. coli*
2. *M. smegmatis*
3. Baculovirus
4. Lambda Phage

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.30 (Question Id - 11104)

Which of the following is correct about the endoplasmic reticulum?

1. The smooth endoplasmic reticulum is involved in glycosylating the proteins
2. The rough endoplasmic reticulum is involved in synthesis of proteins that will either be inserted into cellular membranes or be secreted from the cell
3. The lumen of rough endoplasmic reticulum is highly reducing in nature
4. The smooth endoplasmic reticulum synthesizes globular proteins and rough endoplasmic reticulum synthesizes fibrillar proteins

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.31 (Question Id - 11106)

Which one of the following amino acids contributes to the sulfur content in a protein?

1. Methionine
2. Proline
3. Leucine
4. Phenylalanine

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.32 (Question Id - 11121)

In a reaction, if P (product) is at a lower internal energy level than S (substrate), then the reaction is

1. Endothermic
2. Exothermic
3. Homothermic
4. Exomorphic

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.33 (Question Id - 11133)

Cytokine released in response to virus infection is termed as

1. Interleukin
2. Interferon
3. Monokine
4. Lymphokine

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.34 (Question Id - 11130)

A humanized murine antibody is one in which the

1. Heavy and light chain are from humans.
2. Heavy chain is from human and the light chain is from mouse
3. Light chain is from human and the heavy chain is from mouse
4. CDRs are from mouse and the other regions are from humans

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.35 (Question Id - 11074)

Which of the following is a dominant genetic trait in humans?

1. Alkaptonuria
2. Sickle cell anemia
3. Huntington's disease
4. Phenylketonuria

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.36 (Question Id - 11123)

Which is the most abundant protein in the entire biosphere?

1. Collagen
2. Haemoglobin
3. Proteases
4. Ribulose bisphosphate Carboxylase-Oxygenase

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.37 (Question Id - 11080)

Which of the following is desirable in a primer for PCR?

1. Should always be more than 50 nucleotides in length
2. Secondary structures such as hairpins
3. Sequences with stretches of identical single nucleotides
4. Minimal complementarity between reverse and forward primers

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.38 (Question Id - 11117)

Which of the following process involves the formation of nitrate from ammonia?

1. Ammonification
2. Denitrification
3. Nitrification
4. Nitrogen fixation

- ○ 1
- ○ 2
- ○ 3

○ 4

Question No.39 (Question Id - 11071)

Neurotransmitters can be either excitatory or inhibitory, depending on where they are released, what receptors they bind to, and the ionic conditions that they encounter. Which of the following is a group of excitatory neurotransmitters?

1. Glycine and Glutamate
2. γ-aminobutyric acid (GABA) and Glycine
3. Glutamate, Acetylcholine and Serotonin
4. γ-aminobutyric acid (GABA) and Serotonin

○ 1
○ 2
○ 3
○ 4

Question No.40 (Question Id - 11094)

A gene whose expression helps to identify transformed cell is known as

1. Regulatory gene
2. Housekeeping gene
3. Structural gene
4. Selectable marker

○ 1
○ 2
○ 3
○ 4

Question No.41 (Question Id - 11139)

Which of the following statements are NOT true for photochemical smog?

1. It is called oxidizing smog
2. Its main component is SO_2
3. It occurs in warm and dry climate
4. It is formed due to burning of fossil fuels

○ 1
○ 2
○ 3
○ 4

Question No.42 (Question Id - 11124)

Trihydroxypropane is commonly known as

1. Glycine
2. Glyceride
3. Glycerol
4. Glycolide

○ 1
○ 2
○ 3
○ 4

Question No.43 (Question Id - 11143)

Anaerobic digestion proceeds in 4 steps. Which of the following represents the correct order of these four steps?

1. Hydrolysis --> Acetogenesis --> Acidogenesis --> Methanogenesis
2. Hydrolysis --> Acidogenesis --> Acetogenesis --> Methanogenesis
3. Methanogenesis --> Acidogenesis --> Acetogenesis --> Hydrolysis
4. Acidogenesis --> Hydrolysis --> Acetogenesis --> Methanogenesis

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.44 (Question Id - 11152)

Given below are two statements:

Statement I: The T-DNA region of a naturally occurring (native) Ti plasmid of *Agrobacterium tumefaciens* contains genes for biosynthesis of plant hormones.
Statement II: The *virulence* genes of *Agrobacterium tumefaciens* are placed on a Helper Plasmid during development of a binary vector system for plant transformation.

In the light of the above statements, choose the ***correct*** answer from the options given below

1. Both Statement I and Statement II are true
2. Both Statement I and Statement II are false
3. Statement I is correct but Statement II is false
4. Statement I is incorrect but Statement II is true

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.45 (Question Id - 11118)

The distance between each turn in the helical strand of DNA is

1. 20 Å
2. 34 Å
3. 28 Å
4. 42 Å

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.46 (Question Id - 11081)

Which of the following is a heteropolysaccharide?

1. Chitin
2. Dextran
3. Agarose
4. Glycogen

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.47 (Question Id - 11127)

Which antibody is involved in Type I hypersensitivity reaction?

1. IgM
2. IgG
3. IgE
4. IgA

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.48 (Question Id - 11102)

Which of the following is generally NOT a step in PCR?

1. Denaturation
2. Elongation
3. Annealing
4. Ligation

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.49 (Question Id - 11099)

To combat a severe viral infection, what kind of immune response should be elicited?

1. Innate immune response only
2. Humoral response only
3. Cell mediated immune response only
4. Both humoral and cell mediated immune response

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.50 (Question Id - 11145)

The UN Conference on Environment and Development (UNCED) is popularly known as

1. Montreal protocol
2. Basel conference
3. Paris conference
4. Earth summit

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.51 (Question Id - 11095)

Which of the following exhibits maximum mobility in an agarose gel?

1. Nicked Plasmid DNA
2. Supercoiled Plasmid DNA
3. Linear Plasmid DNA
4. Single stranded Plasmid DNA

- ○ 1
- ○ 2

○ 3
○ 4

Question No.52 (Question Id - 11068)

Charles Richet was awarded Nobel Prize in Physiology or Medicine for his seminal discovery of

1. immunoglobulins
2. hypersensitivity
3. mRNA vaccines
4. malaria vaccine

○ 1
○ 2
○ 3
○ 4

Question No.53 (Question Id - 11075)

The structural gene *lac A* in the Lac operon is responsible for

1. prevent entry of glucose into the bacterial cell
2. conversion of disaccharide sugar into their monosaccharides
3. conversion of lactose to allolactose
4. removal of toxic byproducts of lactose digestion

○ 1
○ 2
○ 3
○ 4

Question No.54 (Question Id - 11153)

Match List I with List II

List I	List II
A. Nitrogen	I. Carbon source
B. Sucrose	II. Macronutrient
C. Manganese	III. Organic supplement
D. Myoinositol	IV. Micronutrient

Choose the correct answer from the options given below that is the best possible match of various components of plant tissue culture media (List I) and their role (List II):

1. A-IV, B-III, C-II, D-I
2. A-II, B-I, C-IV, D-III
3. A-III, B-IV, C-I, D-II
4. A-III, B-I, C-II, D-IV

○ 1
○ 2
○ 3
○ 4

Question No.55 (Question Id - 11082)

Match List I with List II

Antibiotic	Mode of Action
A. Ampicillin	I. Inhibits translation by binding to 50S ribosomal subunit
B. Kanamycin	II. Inhibits translation by binding to 30S ribosomal subunit
C. Hygromycin-B	III. Inhibits cell wall synthesis by disrupting peptidoglycan cross-linki
D. Chloramphenicol	IV. Inhibits translation by interfering with ribosomal translocation

Choose the correct answer from the options given below:

1. A-III, B-II, C-IV, D-I
2. A-IV, B-III, C-II, D-I
3. A-II, B-III, C-IV, D-I
4. A-III, B-IV, C-I, D-II

○ 1
○ 2
○ 3
○ 4

Question No.56 (Question Id - 11151)

Which one of the following would, in general, NOT be a preferred choice for transgenic plants?

1. Transgenic plants with higher levels of transgene expression
2. Transgenic plants with single-copy insertion of the transgene
3. Transgenic plants without any pleiotropic effects of the transgene
4. Transgenic plants with integration of multiple copies of the transgene

○ 1
○ 2
○ 3
○ 4

Question No.57 (Question Id - 11120)

Most bacteria require vitamins as

1. growth factors
2. energy source
3. carbon source
4. source of electron donors

○ 1
○ 2
○ 3
○ 4

Question No.58 (Question Id - 11131)

Symptoms of an allergy attack can be prevented by

1. Reducing the number of helper T cells in the body
2. Blocking the attachment of the IgE antibodies to the mast cells
3. Blocking the attachment of cytotoxic cells to dendritic cells.
4. Reducing the number of natural killer cells.

○ 1
○ 2
○ 3
○ 4

Question No.59 (Question Id - 11089)

Which of the following is NOT a multiple sequence alignment program?

1. CLUSTALX
2. AMBER
3. CLUSTALW
4. PILEUP

○ 1
○ 2
○ 3
○ 4

Question No.60 (Question Id - 11101)

The genome of Hepatitis B, a DNA virus, is unlikely to code for

1. DNA dependent DNA polymerase
2. RNA dependent DNA polymerase
3. DNA dependent RNA polymerase
4. Envelope protein

○ 1
○ 2
○ 3
○ 4

Question No.61 (Question Id - 11079)

Which of the following could be a recognition site of a Type IIp restriction endonuclease?

1. 5'-TTAACCGGAA-3'
2. 5'-GCTAATAGC-3'
3. 5'-TTTAATTAAA-3'
4. 5'-CCCTATAGG-3'

○ 1
○ 2
○ 3
○ 4

Question No.62 (Question Id - 11076)

Which one of the following is **incorrect** about DNA microarray?

1. It is used for transcriptome analysis
2. It is used to identify expression of microRNAs only
3. All the expressed genes of a sample can be analyzed simultaneously
4. It can qualitatively as well as quantitatively analyze the expression of particular mRNA

○ 1
○ 2
○ 3
○ 4

Question No.63 (Question Id - 11155)

Match List I with List II

List I	List II
A. *phytoene synthase*	I. DMH-11 mustard hybrid
B. *barnase-barstar* system	II. Bt cotton
C. *EPSPS*	III. Golden rice
D. *CryIA(c)*	IV. RoundUp Ready soybean

Choose the correct answer from the options given below:

1. A-IV, B-III, C-I, D-II
2. A-IV, B-II, C-I, D-III
3. A-III, B-I, C-IV, D-II
4. A-III, B-IV, C-I, D-II

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.64 (Question Id - 11129)

Given below are two statements: one is labelled as **Assertion A** and the other is labelled as **Reason R**

Assertion A: Normally, the influenza virus changes its structure slightly for each passing year. Although, we are being exposed to these "modified" or slightly mutated and evolving influenza strains every year, we do not always come down with the flu-disease even if we have not received the yearly influenza vaccine. However, sometimes, we do get a really bad case of the flu, despite the fact that we have memory cells left from previous infections with the influenza virus.

Reason R: This is a concept of original antigenic sin, which suggests that we only mount a primary response once we have exhausted the potential to use our memory cells to eradicate the infection. Since most of our first encounters with influenza will vary, the years in which "all" of the key influenza epitopes are significantly "new" to each of us will also vary. It is only in these years that we experience a new primary response to influenza virus, and therefore symptoms of the flu are most severe.

In the light of the above statements, choose the **correct** answer from the options given below

1. Both **A** and **R** are true and **R** is the correct explanation of **A**
2. Both **A** and **R** are true but **R** is **NOT** the correct explanation of **A**
3. **A** is true but **R** is false
4. **A** is false but **R** is true

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.65 (Question Id - 11077)

Xeroderma pigmentosum, an autosomal recessive disorder, is caused due to defects in

1. Nucleotide Excision Repair Pathway
2. Base Excision Repair Pathway
3. Double Strand Break Repair Pathway
4. Homologous Recombination Repair Pathway

○ 1
○ 2
○ 3
○ 4

Question No.66 (Question Id - 11113)

The cell mass of *E.coli* can be chemically represented as $CH_{1.77}\ O_{0.49}\ N_{0.24}$. The degree of reduction for this biomass (based on available electrons) is

1. 6.50
2. 2.50
3. 3.47
4. 4.07

○ 1
○ 2
○ 3
○ 4

Question No.67 (Question Id - 11063)

Sterilization of fermentation media with steam is performed at

1. 100 ^{o}C for 30 minutes
2. 150^{o}C for 5 minutes
3. 121 ^{o}C for 10 minutes
4. 121^{o}C for 20 minutes

○ 1
○ 2
○ 3
○ 4

Question No.68 (Question Id - 11105)

Which of the following DNA, in its double-stranded form, will have the highest Tm?

1. ATGTTGGACCTTGAGTAATGCTA
2. AAAGGATTTCCCTTTGATCGTATG
3. ATTTACTAGATTACTAGTATTGATA
4. GCTTATGTATACCGGTTAGATCG

○ 1
○ 2
○ 3
○ 4

Question No.69 (Question Id - 11141)

Which of the following is true for a water sample with BOD value of more than 50 ppm?

1. The DO content would be less than 6 ppm
2. The water is clean
3. The amount of organic matter is very less
4. The aquatic life will be thriving

○ 1

○ 2
○ 3
○ 4

Question No.70 (Question Id - 11112)

Match list I with List II

List I (Enzymes)	List II (Application)
A. Alkalase	I. Animal feed
B. Lipase	II. Maltose rich syrup
C. ß-amylase	III. Degreasing of leather hides
D. Phytase	IV. Bioactive peptides

Choose the most appropriate match from the options given below:

1. A-I, B-II, C-III, D-IV
2. A-II, B-III, C-I, D-IV
3. A-IV, B-III, C-I, D-II
4. A-IV, B-III, C-II, D-I

○ 1
○ 2
○ 3
○ 4

Question No.71 (Question Id - 11100)

A monoclonal antibody was heterologously expressed in *E. coli* and Chinese hamster ovary (CHO) cell line, and the recombinant proteins obtained were purified to homogeneity and were found to be structurally identical. However, the protein expressed in *E. coli* was not functionally active. The reason could be

1. The protein needs glycosylation for its function
2. *E. coli* introduced phosphorylation which was detrimental for function
3. CHO cells generally phosphorylate the heterologously expressed protein
4. There may be an inactivating ubiquitination modification in *E. coli*

○ 1
○ 2
○ 3
○ 4

Question No.72 (Question Id - 11144)

Which of the following factors DO NOT affect the operation of a trickling filter?

1. organic loading
2. hydraulic flow rates
3. temperature of the water and air
4. linear flow velocity of the liquid

○ 1
○ 2
○ 3
○ 4

Question No.73 (Question Id - 11157)

The pH indicator used for animal cell culture media is

1. $CaCl_2$
2. Phenol red
3. Fetal Bovine Serum
4. Phenolphthalein

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.74 (Question Id - 11108)

Match list I with List II

List I	**List II**
A. Coenzyme A	I. Riboflavin
B. FAD	II. Pantothenic acid
C. Thiamine pyrophosphate	III. Niacin
D. NAD^+	IV. Vitamin B_1

Choose the most appropriate match from the options given below:

1. A-I, B-II, C-III, D-IV
2. A-II, B-I, C-IV, D-III
3. A-III, B-IV, C-I, D-II
4. A-IV, B-III, C-II, D-I

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.75 (Question Id - 11116)

Fermentation of fruit juice to vinegar involves the use of

1. Yeast only
2. Yeast with lactic acid bacteria
3. Yeast with butyric acid bacteria
4. Yeast with acetic acid bacteria

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.76 (Question Id - 11122)

The electron transport system is present in the

1. Inner mitochondrial membrane
2. Outer mitochondrial membrane
3. Outer chloroplast membrane
4. Mitochondrial matrix

- ○ 1
- ○ 2

○ 3
○ 4

Question No.77 (Question Id - 11149)

Which of the following group of viruses generally infect plants?

1. Retroviruses
2. Riboviruses
3. Rheoviruses
4. Enteroviruses

○ 1
○ 2
○ 3
○ 4

Question No.78 (Question Id - 11142)

The issue of pesticide contamination of carbonated drinks was brought into limelight by which of the following NGO?

1. Centre for Science and Environment
2. Bombay Natural History Society
3. Green Peace
4. Kalpavriksh

○ 1
○ 2
○ 3
○ 4

Question No.79 (Question Id - 11085)

Find the odd one out with respect to pleotropic gene expression:

1. White eye gene in *Drosophila*
2. Flower color gene in *Pisum sativum*
3. Marfan's Syndrome
4. Plumage color in poultry

○ 1
○ 2
○ 3
○ 4

Question No.80 (Question Id - 11154)

The addition of silver nitrate in plant tissue culture media is useful for managing and minimizing detrimental effects of which of the following plant hormones?

1. NAA
2. ethylene
3. GA-34
4. kinetin

○ 1
○ 2
○ 3
○ 4

Question No.81 (Question Id - 11065)

In a typical bacterial growth curve, the phase in which cells adapt to growth condition and are metabolically active but not able to divide is:

1. Stationary phase
2. Lag phase
3. Exponential phase
4. Death phase

○ 1
○ 2
○ 3
○ 4

Question No.82 (Question Id - 11090)

Given below are two statements:

Statement I: Protein-ligand docking involves binding of a small molecule to the protein receptor.
Statement II: Both AUTODOCK and LUDI are protein-ligand docking programs

In the light of the above statements, choose the **correct** answer from the options given below

1. Both Statement I and Statement II are true
2. Both Statement I and Statement II are false
3. Statement I is correct but Statement II is false
4. Statement I is incorrect but Statement II is true

○ 1
○ 2
○ 3
○ 4

Question No.83 (Question Id - 11078)

Which of the following is NOT correct about mutagenesis using a chemical mutagen?

1. Low frequency of mutations in the gene of interest
2. Inability to confirm the location of the causal mutation even after getting the desired phenotype
3. Creation of point mutations at a specific position in the gene of interest
4. Analysis of a large number of offspring is required to isolate the desired mutant

○ 1
○ 2
○ 3
○ 4

Question No.84 (Question Id - 11061)

Which of the following bacterium is generally used in plant genetic engineering?

1. *Thermus aquaticus*
2. *Pseudomonas syringae*
3. *Agrobacterium tumifaciens*
4. *Escherichia coli*

○ 1
○ 2
○ 3
○ 4

Question No.85 (Question Id - 11126)

The "Microglial Cells" found in human brain, represent which of the following class of innate immune cells?

1. NK cells
2. Macrophages
3. Eosinophils
4. Neutrophils

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.86 (Question Id - 11150)

Which of the following is an enveloped virus?

1. Dengue virus
2. Polio virus
3. Foot and mouth disease virus
4. Adenovirus

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.87 (Question Id - 11067)

Vaccination in the last century had resulted in 100% reduction in active cases across the globe for

1. small pox
2. hepatitis B
3. tetanus
4. tuberculosis

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.88 (Question Id - 11138)

The study of various atmospheric parameters is called

1. Geology
2. Hydrology
3. Meteorology
4. Environmental Biology

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.89 (Question Id - 11114)

A culture of *E.coli* cells (1 ml) was diluted 10^6 fold and 100 µl of this was used for plating. After 24 hours incubation, the number of colony forming units (CFU) was found to be 180. The CFU count of the original culture is

1. 1.8×10^9 CFU/ml
2. 1.8×10^6 CFU/ml
3. 1.8×10^7 CFU/ml
4. 1.8×10^8 CFU/ml

○ 1
○ 2
○ 3
○ 4

Question No.90 (Question Id - 11087)

Given below are two statements:

Statement I: Orthologs are sequences from different organisms or genomes derived from speciation events while paralogs are sequences from the same organism or genome, which are derived from gene duplication events rather than speciation events.

Statement II: Both orthologs and paralogs are homologous sequences

In the light of the above statements, choose the **correct** answer from the options given below-

1. Both Statement I and Statement II are true
2. Both Statement I and Statement II are false
3. Statement I is correct but Statement II is false
4. Statement I is incorrect but Statement II is true

○ 1
○ 2
○ 3
○ 4

Question No.91 (Question Id - 11092)

Which of the following is a structurally independent three-dimensional unit associated with a particular functional role?

1. Domain
2. Motif
3. Strand
4. Helix

○ 1
○ 2
○ 3
○ 4

Question No.92 (Question Id - 11070)

Which of the following is a multinucleated cell present in the bones of human body?

1. Cartilage
2. Osteoclasts
3. Osteoblast
4. Osteocyte

○ 1
○ 2
○ 3
○ 4

Question No.93 (Question Id - 11084)

Which of the following statement is NOT correct with respect to Cybrids?

1. They are the resultants of spontaneous fusion of protoplasts obtained from common callus culture
2. They allow the direct transfer of cytoplasmic male sterility(CMS) from donor to recipient
3. The process can bypass up to 12 backcrosses required in development of alloplasmic lines
4. It is a fusion of protoplast of one parent and cytoplast of the second.

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.94 (Question Id - 11088)

The approximate length of the open reading frame coding for a 55 kDa bacterial protein will be

1. 5000 nucleotides
2. 5500 nucleotides
3. 1500 nucleotides
4. 3000 nucleotides

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.95 (Question Id - 11066)

Which of the following is generally NOT a primary metabolite?

1. Amino acids
2. Polysaccharides
3. Antibiotics
4. Vitamins

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.96 (Question Id - 11097)

How much protein will you need to make 100 microlitres of 15 micromolar solution of a 95 kDa protein?

1. 0.1425 mg
2. 1.425mg
3. 0.01425 mg
4. 14.25 mg

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.97 (Question Id - 11140)

Harmful gases such as SO_2 can be removed from the industrial exhaust using

1. Catalytic convertor
2. Electrostatic precipitator
3. Earmuffs
4. Scrubber

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.98 (Question Id - 11119)

Which of the following mineral elements play an important role in biological nitrogen fixation?

1. Copper
2. Magnesium
3. Molybdenum
4. Zinc

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.99 (Question Id - 11109)

The degree of inhibition for an enzyme catalyzed reaction by an inhibitor is independent of substrate concentration. This is expected in case of

1. Competitive inhibition
2. Un-competitive inhibition
3. Non-competitive inhibition
4. Allosteric inhibition

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Question No.100 (Question Id - 11148)

Which of the following viruses is likely to have the highest genomics mutation rate?

1. Small pox virus
2. Polio virus
3. Hepatitis B Virus
4. Adenovirus

- ○ 1
- ○ 2
- ○ 3
- ○ 4