

# National Testing Agency

**Question Paper Name:** SLS PhD SLS 29th May Shift2 Set1  
**Subject Name:** PhD SLS  
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**Actual Answer Key:** Yes

## PhD SLS

**Group Number :** 1  
**Group Id :** 128206180  
**Group Maximum Duration :** 0  
**Group Minimum Duration :** 120  
**Revisit allowed for view? :** No  
**Revisit allowed for edit? :** No  
**Break time:** 0  
**Group Marks:** 100

## PART A

**Section Id :** 128206297  
**Section Number :** 1  
**Section type :** Online  
**Mandatory or Optional:** Mandatory  
**Number of Questions:** 10  
**Number of Questions to be attempted:** 10  
**Section Marks:** 10  
**Display Number Panel:** Yes  
**Group All Questions:** No

**Sub-Section Number:** 1  
**Sub-Section Id:** 128206480  
**Question Shuffling Allowed :** Yes

**Question Number : 1 Question Id : 12820610474 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**  
**Single Line Question Option : No Option Orientation : Vertical**  
**Correct Marks : 1 Wrong Marks : 0**

Rama has a total of Rs 26000. If he has equal number of 100, 500 and 2000 currency notes, what is the number of notes of each denomination he has?

- a) Five
- b) Ten
- c) Fifteen
- d) Twenty

Options :

12820641399. A

12820641400. B

12820641401. C

12820641402. D

Question Number : 2 Question Id : 12820610475 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If  $a + b = 8$  and  $a^2 + b^2 = 34$ ; what would be the value of  $ab$ ?

- a) 9
- b) 12
- c) 15
- d) 20

Options :

12820641403. A

12820641404. B

12820641405. C

12820641406. D

Question Number : 3 Question Id : 12820610476 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

You are filling one water bath by carrying water in a beaker. You need three beakers of water to fill it. How many beakers of water you would need if the capacity of the beaker is reduced to  $\frac{3}{5}$ <sup>th</sup> of the original volume?

- a) 5
- b) 8
- c) 10
- d) 12

Options :

12820641407. A

12820641408. B

12820641409. C

12820641410. D

Question Number : 4 Question Id : 12820610477 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

$$\frac{(123 + 238)^2 - (123 - 238)^2}{(123 \times 238)} = ?$$

- a) 64
- b) 36
- c) 16
- d) 4

Options :

- 12820641411. A
- 12820641412. B
- 12820641413. C
- 12820641414. D

Question Number : 5 Question Id : 12820610478 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

You and two of your colleagues, Rahul and Pooja, are planning an experiment requiring mice. If you have to share a total 1360 animals in such a way that whatever Pooja gets, Rahul gets  $\frac{1}{4}$  of that and you get  $\frac{2}{3}$ <sup>rd</sup> of what Rahul gets. How many mice would Rahul get?

- a) 480
- b) 960
- c) 240
- d) 120

Options :

- 12820641415. A
- 12820641416. B
- 12820641417. C
- 12820641418. D

Question Number : 6 Question Id : 12820610479 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If you have to draw one ticket from twenty tickets marked 1 to 20, what is the probability that you would draw a number that is a multiple of 3 or 5?

- a)  $\frac{1}{2}$
- b)  $\frac{1}{5}$
- c)  $\frac{6}{20}$
- d)  $\frac{9}{20}$

Options :

- 12820641419. A
- 12820641420. B

12820641421. C

12820641422. D

Question Number : 7 Question Id : 12820610480 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If  $\log 36 = 1.642$ , what would be the value of  $\log 6$ ?

- a) 0.410
- b) 0.547
- c) 0.821
- d) 3.284

Options :

12820641423. A

12820641424. B

12820641425. C

12820641426. D

Question Number : 8 Question Id : 12820610481 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

$$(11)^{2.6} \times (11)^? = (11)^{5.6}$$

- a) 2.0
- b) 2.5
- c) 3.0
- d) 3.5

Options :

12820641427. A

12820641428. B

12820641429. C

12820641430. D

Question Number : 9 Question Id : 12820610482 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

You are designing an experiment requiring mice, *Drosophila* and *C elegans*. If the ratio of the number of mice and *Drosophila* is 5:3, and that of the *Drosophila* and *C elegans* is 9: 7, the ratio between the number of mice and *C elegans* would be

- a) 5:7
- b) 15:7
- c) 9:14
- d) 5:14

Options :

12820641431. A

12820641432. B  
12820641433. C  
12820641434. D

Question Number : 10 Question Id : 12820610483 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

You are planning one experiment that would take 20 days if both you and your colleague Rahul do it together. If you do it alone, it would take 30 days. Both you and Rahul started the experiment but Rahul fell sick after ten days and you have to finish it alone. The time required for completing it is

- a) 10
- b) 12.5
- c) 15
- d) 20

Options :

12820641435. A  
12820641436. B  
12820641437. C  
12820641438. D

#### PART B

Section Id :	128206298
Section Number :	2
Section type :	Online
Mandatory or Optional:	Mandatory
Number of Questions:	75
Number of Questions to be attempted:	60
Section Marks:	90
Display Number Panel:	Yes
Group All Questions:	No

Sub-Section Number:	1
Sub-Section Id:	128206481
Question Shuffling Allowed :	Yes

Question Number : 11 Question Id : 12820610484 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1.5 Wrong Marks : 0

Analysis of the genomic content from an organism showed 35% adenine, 22% guanine, 25% thymine, and 18% cytosine. The genomic content in this organism is:

- a) Double-stranded DNA
- b) Single-stranded DNA
- c) Single-stranded RNA
- d) Double-stranded RNA

Options :

12820641439. A

12820641440. B

12820641441. C

12820641442. D

Question Number : 12 Question Id : 12820610485 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

A female right-handed coiled snail (genotype  $Ss$ ) mated with a male left-handed coiled snail (genotype  $Ss$ ) where  $S$  is dominant to  $s$ . How many of the progeny would have right-handed coiled shell?

- a) 100%
- b) 75%
- c) 50%
- d) 25%

Options :

12820641443. A

12820641444. B

12820641445. C

12820641446. D

Question Number : 13 Question Id : 12820610486 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

A plant with genotype  $AaBBccDdEe$  is crossed with  $AAbbCCddee$ . What proportion of progeny will have the genotype  $AaBbCcDdEe$ ?

- a)  $1/8$
- b)  $1/4$
- c)  $1/2$
- d) 1

Options :

12820641447. A

12820641448. B

12820641449. C

12820641450. D



Question Number : 14 Question Id : 12820610487 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

Which of the following depicts a Test Cross? + denotes wild type gene while a, b, c, denote the recessive genes.

- a) +++/+++ X +++/abc
- b) +++/abc X a+c/a+c
- c) +b+/a+c X abc/abc
- d) +b+/abc X +b+/abc

Options :

12820641451. A

12820641452. B

12820641453. C

12820641454. D

Question Number : 15 Question Id : 12820610488 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

Cytogenetic analysis shows two Barr bodies in a cell of a person. Which one of the following is the correct genotype?

- a) XX
- b) XXY
- c) XXYY
- d) XXXY

Options :

12820641455. A

12820641456. B

12820641457. C

12820641458. D

Question Number : 16 Question Id : 12820610489 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

You are studying histidine biosynthesis in *S cerevisiae* and isolated 6 haploid mutants that are histidine auxotrophs. Each mutant was crossed pair-wise and all diploids were found to be prototrophic. How many different *his* genes are identified in this genetic screen?

- a) 3
- b) 4
- c) 6
- d) 12

Options :

12820641459. A

12820641460. B

12820641461. C

12820641462. D

Question Number : 17 Question Id : 12820610490 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

Different molecular structures formed due to the rotation of different groups on single bonds are called

- a) Conformations
- b) Enantiomers
- c) Epimers
- d) Anomers

Options :

12820641463. A

12820641464. B

12820641465. C

12820641466. D

Question Number : 18 Question Id : 12820610491 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

Which of the following is NOT a classical domain involved in DNA binding?

- a) Helix-Turn-Helix
- b) Leucine zipper
- c) Zinc Finger
- d) Cysteine-rich

Options :

12820641467. A

12820641468. B

12820641469. C

12820641470. D

Question Number : 19 Question Id : 12820610492 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

EF hand motif containing proteins are generally involved in binding

- a) manganese at the catalytic sites of certain enzymes
- b) calcium and signaling
- c) zinc and stabilizing it
- d) iron for its storage

Options :

12820641471. A

12820641472. B

12820641473. C

12820641474. D



Question Number : 20 Question Id : 12820610493 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

The  $\alpha$ - and  $\beta$ - subunits of human haemoglobin contains

- a) only  $\beta$ -strands
- b) only  $\alpha$ -helices
- c) both  $\alpha$ -helices and  $\beta$ -strands
- d) both  $\alpha$ - and  $3_{10}$  helices

Options :

12820641475. A

12820641476. B

12820641477. C

12820641478. D

Question Number : 21 Question Id : 12820610494 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

$\Delta G$  would be negative for which of the following processes?

- a) Combustion of Carbon
- b) Oxidation of nitrogen
- c) Synthesis of glucose from  $CO_2$
- d) Hydrolysis of  $H_2O$

Options :

12820641479. A

12820641480. B

12820641481. C

12820641482. D

Question Number : 22 Question Id : 12820610495 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

When NaCl dissolves in water

- a) entropy decreases
- b) entropy increases
- c) there is no change in enthalpy
- d) there is no change in entropy

Options :

12820641483. A

12820641484. B

12820641485. C

12820641486. D

Question Number : 23 Question Id : 12820610496 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

Which one of the following stages of mitosis shows a decondensed state of chromatin?

- a) Metaphase
- b) Anaphase
- c) Telophase
- d) Interphase

**Options :**

- 12820641487. A
- 12820641488. B
- 12820641489. C
- 12820641490. D

**Question Number : 24 Question Id : 12820610497 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1.5 Wrong Marks : 0**

Classical insulin receptor belongs to which of the following family?

- a) Nuclear receptors
- b) Orphan receptors
- c) Tyrosine Kinase receptors
- d) Gated receptors

**Options :**

- 12820641491. A
- 12820641492. B
- 12820641493. C
- 12820641494. D

**Question Number : 25 Question Id : 12820610498 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1.5 Wrong Marks : 0**

Free movement of small molecules across the mitochondrial intermembrane space and cytoplasm occurs through which one of the following?

- a) Mitoporins
- b) Perforins
- c) Pseudoporins
- d) Porins

**Options :**

- 12820641495. A
- 12820641496. B
- 12820641497. C
- 12820641498. D

**Question Number : 26 Question Id : 12820610499 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1.5 Wrong Marks : 0**

In compound microscope, magnification of the image does NOT depend on the

- a) focal length of the objective
- b) focal length of the eye piece
- c) numerical aperture
- d) the length of the tube

Options :

12820641499. A

12820641500. B

12820641501. C

12820641502. D

Question Number : 27 Question Id : 12820610500 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

Name of the scientists and their discoveries are given below in column A and B respectively. Select the option that correctly matches the name and the discovery.

Column A

- a. Peter Agre
- b. Herbert Spencer
- c. Tu Youyou
- d. Jeffrey C. Hall

Column B

- i. Coined 'survival of the fittest'.
- ii. Novel therapy against malaria
- iii. Discovery of water channels
- iv. Molecular mechanism of circadian rhythm

- a) a-iv, b-i, c-ii, d-iii
- b) a-iii, b-i, c-ii, d-iv
- c) a-iv, b-ii, c-i, d-iii
- d) a-iii, b-ii, c-i, d-iv

Options :

12820641503. A

12820641504. B

12820641505. C

12820641506. D

Question Number : 28 Question Id : 12820610501 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

Differentiation of a cell during embryogenesis involves processes like specification and determination. Of the following four statements which are true:

- i. Autonomous specification leads to mosaic development
  - ii. Autonomous specification leads to regulative development
  - iii. Conditional specification leads to regulative development
  - iv. Conditional specification leads to mosaic development
- a) i and iii
  - b) ii and iv
  - c) i and iv
  - d) ii and iii

Options :

12820641507. A

12820641508. B

12820641509. C

12820641510. D

Question Number : 29 Question Id : 12820610502 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

Deletion of ultrabithorax gene in case of *Drosophila* results in a fly with

- a) antenna in place of legs
- b) legs in place of antenna
- c) four wings
- d) two pairs of halteres

Options :

12820641511. A

12820641512. B

12820641513. C

12820641514. D

Question Number : 30 Question Id : 12820610503 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

Which one of the following statements with respect to vulval development in *Caenorabditis elegans* is true?

- a) The six vulval precursor cells (VPC) are not influenced by the anchor cell to form an equivalence group.
- b) In loss of function *lin-12* mutants, both adjacent cells (Z1.ppp and Z4.aaa) become anchor cell.
- c) In gain of function *lin-12* mutants, both adjacent cells (Z1.ppp and Z4.aaa) become anchor cell.
- d) LIN-3 protein is secreted by the uterine cell.

Options :

12820641515. A

12820641516. B



12820641517. C

12820641518. D

Question Number : 31 Question Id : 12820610504 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

The "mid-blastula transition" is the point in development when:

- a) translation of maternal mRNA is initiated
- b) cell determination becomes fixed
- c) cell division in the embryo ends
- d) transcription of zygotic genes begins

Options :

12820641519. A

12820641520. B

12820641521. C

12820641522. D

Question Number : 32 Question Id : 12820610505 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

Which one of the following statements regarding amphibian development is correct?

- a) The "organizer" is induced by the dorsal-most mesodermal cells of the 8-cell embryo.
- b) Nieuwkoop centre secretes Noggin and Chordin proteins.
- c) Accumulation of beta catenin takes place in the future ventral side of the embryo
- d) Gastrulation begins with invagination of bottle cells followed by the coordinated involution of the mesoderm and the epiboly of the ectoderm.

Options :

12820641523. A

12820641524. B

12820641525. C

12820641526. D

Question Number : 33 Question Id : 12820610506 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

Which of the following hormones is responsible for the mobilization of calcium and phosphate for the mineralization of bones in mammals?

- a) parathyroid hormone
- b) thyroid hormone
- c) glucocorticoid
- d) mineralocorticoid

Options :

12820641527. A

12820641528. B

12820641529. C



12820641530. D

Question Number : 34 Question Id : 12820610507 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

Specificity of information processing in the nervous system is due to the

- a) electrical signaling
- b) transmembrane potential
- c) presence of neurotransmitter and its subtype of receptor
- d) presence of neurotransmitter alone

Options :

12820641531. A

12820641532. B

12820641533. C

12820641534. D

Question Number : 35 Question Id : 12820610508 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

The process by which an electrode is guided to a predefined region in the brain is known as :

- a) Stereoscopy
- b) Stereotaxic surgery
- c) Craniotomy
- d) Laparoscopy

Options :

12820641535. A

12820641536. B

12820641537. C

12820641538. D

Question Number : 36 Question Id : 12820610509 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

During the generation of an action potential, the influx of  $\text{Na}^+$  ions into a neuron is :

- a) a carrier mediated transport because  $\text{Na}^+$  ions possess a net charge on it.
- b) NOT a carrier mediated transport because  $\text{Na}^+$  ions possess a net charge on it.
- c) a carrier mediated transport due to the presence of Na-K ATPase in the membrane.
- d) NOT a carrier mediated transport because entry of such large number of  $\text{Na}^+$  ions within such short time cannot be empirically explained.

Options :

12820641539. A

12820641540. B

12820641541. C

12820641542. D

Question Number : 37 Question Id : 12820610510 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

Every 100 mL of deoxygenated blood delivers how much of CO<sub>2</sub> in the alveoli?

- a) 15mL
- b) 5mL
- c) 4mL
- d) 3 mL

Options :

12820641543. A

12820641544. B

12820641545. C

12820641546. D

Question Number : 38 Question Id : 12820610511 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

Which one of the following statements is true about the taste receptor cells in vertebrates?

- a) Taste receptor cells never die
- b) Each taste receptor cells live for ten days and then regenerate regularly into new test receptor cell
- c) Taste receptor cells die in old age
- d) Taste receptor cells are more in number in the childhood

Options :

12820641547. A

12820641548. B

12820641549. C

12820641550. D

Question Number : 39 Question Id : 12820610512 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

Hematocrit is the

- a) amount of Hemoglobin/100 ml of blood
- b) amount of RBC/100 ml of blood
- c) volume percentage of RBC in blood
- d) amount of WBC/100 ml of blood

Options :

12820641551. A

12820641552. B

12820641553. C

12820641554. D

Question Number : 40 Question Id : 12820610513 Question Type : MCQ Option Shuffling : No Display Qu  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

The mammals usually do not lay eggs, but one of the following does

- a) Hedgehog
- b) Spiny anteater
- c) Scaly anteater
- d) Canadian Porcupine

Options :

12820641555. A

12820641556. B

12820641557. C

12820641558. D

Question Number : 41 Question Id : 12820610514 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

Bacteria growing within macrophages are killed by the

- a) Complement system
- b) Cytotoxic T cells
- c) Cytokines released from Th1 cells.
- d) Reactive oxygen and nitrogen intermediates

Options :

12820641559. A

12820641560. B

12820641561. C

12820641562. D

Question Number : 42 Question Id : 12820610515 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

The immune response to antigenic peptides from microbes, carried through blood is initiated in:

- a) Lymph nodes
- b) Thymus
- c) Spleen
- d) Mucosa-associated lymphoid tissues

Options :

12820641563. A

12820641564. B

12820641565. C

12820641566. D

Question Number : 43 Question Id : 12820610516 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

Defensins are

- a) Anti-toxins
- b) Macrolides
- c) Glycolipids
- d) Peptide antibiotics

Options :

12820641567. A

12820641568. B

12820641569. C

12820641570. D

Question Number : 44 Question Id : 12820610517 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

Which one of the following does NOT participate in the formation of antigen-antibody complexes?

- a) Hydrophobic Bonds
- b) Covalent Bonds
- c) Electrostatic Interactions
- d) Hydrogen Bonds

Options :

12820641571. A

12820641572. B

12820641573. C

12820641574. D

Question Number : 45 Question Id : 12820610518 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

The three molecules involved in antigen presentation to CD8 T cells are

- a) TAP, MHC I  $\alpha$  chains, MHC II  $\alpha$  chains
- b) MHC I  $\alpha$  chains, Lysosomal enzymes, invariant chain
- c) MHC II  $\alpha$  chains, Lysosomal enzymes, invariant chain
- d) TAP, MHC I  $\alpha$  chains,  $\beta$ 2 microglobulin

Options :

12820641575. A

12820641576. B

12820641577. C

12820641578. D

Question Number : 46 Question Id : 12820610519 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0



In which phase of the cell cycle would radioactive dTTP be maximally incorporated into the genomic DNA?

- a) G1 phase
- b) G2 phase
- c) M phase
- d) S phase

**Options :**

- 12820641579. A
- 12820641580. B
- 12820641581. C
- 12820641582. D

**Question Number : 47 Question Id : 12820610520 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1.5 Wrong Marks : 0**

Which one of following options best describes positive fluorescence with the dye DAPI?

- a) Nucleus and Lysosome
- b) Nucleus and Peroxisome
- c) Nucleus and Mitochondria
- d) Lysosome and Mitochondria

**Options :**

- 12820641583. A
- 12820641584. B
- 12820641585. C
- 12820641586. D

**Question Number : 48 Question Id : 12820610521 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1.5 Wrong Marks : 0**

The INCORRECT statement regarding N-linked glycosylation is

- a) It occurs in the ER
- b) The pattern of Glycosylation differs significantly among species
- c) It is inhibited by Tunicamycin
- d) It is linked to the amino group of Lysine residues

**Options :**

- 12820641587. A
- 12820641588. B
- 12820641589. C
- 12820641590. D

**Question Number : 49 Question Id : 12820610522 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1.5 Wrong Marks : 0**



All of the following statements are true about Rho family of small GTPase, EXCEPT

- a) They can bind either GTP or GDP
- b) They can phosphorylate the target proteins
- c) They have intrinsic GTPase activity
- d) They can bind to different effector proteins and regulate their activity

Options :

12820641591. A

12820641592. B

12820641593. C

12820641594. D

Question Number : 50 Question Id : 12820610523 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

The electron transport complex that does not pump proton to the intermembrane space is:

- a) Complex I
- b) Complex II
- c) Complex III
- d) Complex IV

Options :

12820641595. A

12820641596. B

12820641597. C

12820641598. D

Question Number : 51 Question Id : 12820610524 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

A graphical plot of the binding of oxygen to myoglobin, showing the relationship between the partial pressure of oxygen and the fraction of myoglobin molecules oxygenated can be best described as:

- a) linear with a negative slope
- b) linear with a positive slope
- c) rectangular hyperbola
- d) sigmoid

Options :

12820641599. A

12820641600. B

12820641601. C

12820641602. D

Question Number : 52 Question Id : 12820610525 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

Proteins separated in SDS-Polyacrylamide gel can NOT be visualized by staining with

- a) Coomassie Brilliant Blue
- b) Silver
- c) Sypro Ruby
- d) Ethidium bromide

Options :

12820641603. A

12820641604. B

12820641605. C

12820641606. D

Question Number : 53 Question Id : 12820610526 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

GPCR stands for

- a) Glucagon-Prolactin Cycling Rate
- b) Glycogen Phosphorylation Coupled Reactions
- c) G Protein Coupled receptor
- d) Glucocorticoid-Progesterone Content Ratio

Options :

12820641607. A

12820641608. B

12820641609. C

12820641610. D

Question Number : 54 Question Id : 12820610527 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

In SDS-PAGE,  $\beta$ -mercaptoethanol is commonly used for

- a) reducing the disulphide bonds
- b) maintaining the 3D structures of the proteins
- c) preventing protein aggregation
- d) subsequent visualization of the protein bands

Options :

12820641611. A

12820641612. B

12820641613. C

12820641614. D

Question Number : 55 Question Id : 12820610528 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

Which one of the following post-translational modification is generally associated with the degradation of proteins?

- a) S-nitrosylation
- b) Myristoylation
- c) S-glutathionylation
- d) Poly-ubiquitination

Options :

12820641615. A

12820641616. B

12820641617. C

12820641618. D

Question Number : 56 Question Id : 12820610529 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

Identify the correct sequence in which electrons are transferred in the electron transport chain.

- a) NADH: ubiquinone oxidoreductase > Cytochrome c oxidase > CoQH<sub>2</sub>-cytochrome c reductase
- b) CoQH<sub>2</sub>-cytochrome c reductase > NADH: ubiquinone oxidoreductase > Cytochrome c oxidase
- c) Succinate dehydrogenase > CoQH<sub>2</sub>-cytochrome c reductase > Cytochrome c oxidase
- d) CoQH<sub>2</sub>-cytochrome c reductase > Cytochrome c oxidase > Succinate dehydrogenase

Options :

12820641619. A

12820641620. B

12820641621. C

12820641622. D

Question Number : 57 Question Id : 12820610530 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

A compound has a molar extinction coefficient of 400 at 500 nm. A solution of this compound was diluted 1:3 and 1:4 and the absorbance were measured as 0.5 and 0.4 respectively. What is the molarity of the original solution?

- a) 2.5 mM
- b) 5 mM
- c) 10mM
- d) 20 mM

Options :

12820641623. A

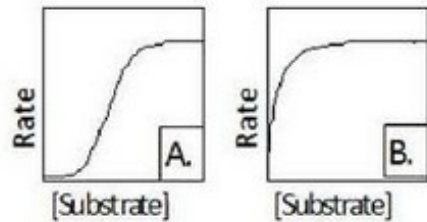
12820641624. B

12820641625. C

Question Number : 58 Question Id : 12820610531 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

A cell lysate assayed for the presence of an enzyme exhibited kinetics which is represented by Graph A. When the enzyme was purified from the cell lysate, the enzyme kinetics for catalysis using the same substrate changed to Graph B.



The most likely explanation for this would be

- The cofactor necessary for its activity got removed from it during its purification.
- The substrate specificity of the impure and pure enzymes are fundamentally different
- A competitive inhibitor of the enzyme did not co-purify with it.
- An allosteric inhibitor of the enzyme did not co-purify with it.

Options :

12820641627. A

12820641628. B

12820641629. C

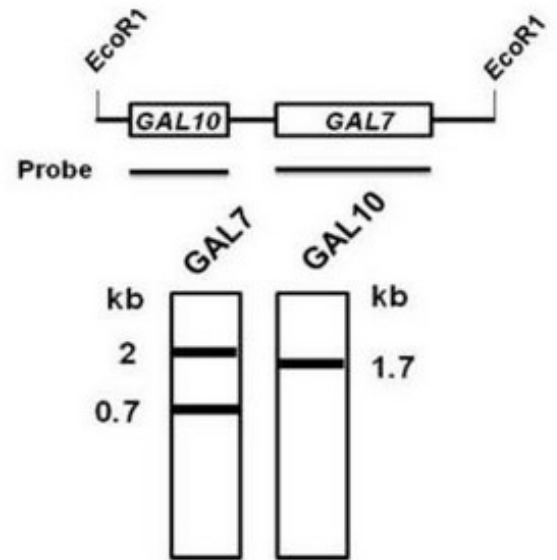
12820641630. D

Question Number : 59 Question Id : 12820610532 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

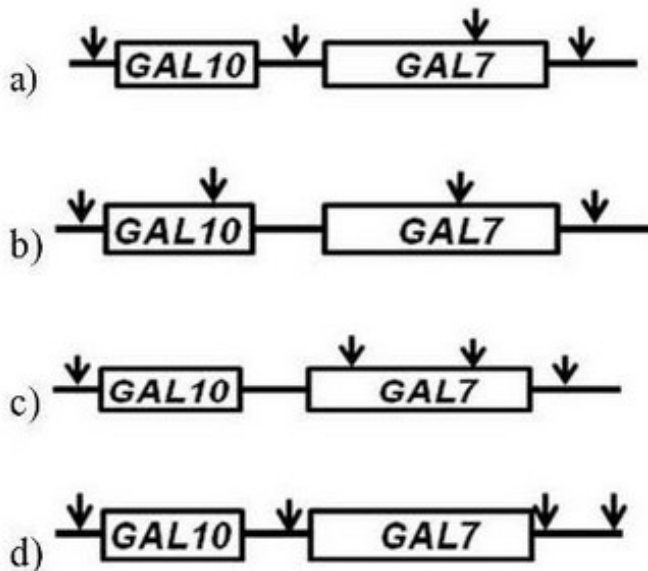
Correct Marks : 1.5 Wrong Marks : 0



Genomic DNA of the yeast *Saccharomyces cerevisiae* bearing GAL10-GAL7 gene in a EcoR1 fragment was digested with Sall restriction enzyme. After agarose gel electrophoresis and Southern blotting with probes corresponding to GAL7 and GAL10 ORF, the above autoradiograms were obtained with respective probes as indicated. Sizes of the bands are in kilo base. Panel A- EcoR1 fragment. Panel B- autoradiogram



Which of the following maps (arrow indicates Sall site) best explains the above results? (Maps shown are not to scale).



Options :

- 12820641631. A
- 12820641632. B
- 12820641633. C
- 12820641634. D

Question Number : 60 Question Id : 12820610533 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

All of the following statements are true regarding “Codon optimization” EXCEPT

- a) It does not cause change in the mRNA sequence
- b) It is carried out to improve protein expression in heterologous host
- c) It does not cause change in the protein sequence
- d) It often helps to fold proteins in heterologous host

Options :

- 12820641635. A



12820641636. B  
12820641637. C  
12820641638. D

Question Number : 61 Question Id : 12820610534 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

Which one of the following technique can be used to quantify protein – protein interactions?

- a) Fluorescent in situ hybridization
- b) Förster resonance energy transfer (FRET)
- c) Chromatin immunoprecipitation (ChIP) assays
- d) South-Western blotting

Options :

12820641639. A  
12820641640. B  
12820641641. C  
12820641642. D

Question Number : 62 Question Id : 12820610535 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

The major mechanisms of turnover of molecules of the plasma membrane is by

- a) diffusion of individual molecules to cytoplasm
- b) endocytosis of patches of membrane
- c) excretion of integral molecules into extracellular media
- d) a multi-subunit enzyme complex present in the cytoplasm

Options :

12820641643. A  
12820641644. B  
12820641645. C  
12820641646. D

Question Number : 63 Question Id : 12820610536 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

A patient was injected with a fluorescent dye for imaging. The biological half-life of the dye is 8 days. The time at which the 3/4th of the fluorescent dye will be eliminated from the body is

- a) 4 days
- b) 8 days
- c) 16 days
- d) 32 days

Options :

12820641647. A  
12820641648. B  
12820641649. C

12820641650. D

Question Number : 64 Question Id : 12820610537 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

It has been proposed that mitochondria have evolved from certain bacteria that existed as endosymbiotic organism in early cells. Which of the following statements do NOT support this theory?

- a) Similarities of rRNA sequences between Mitochondria and free living prokaryotes.
- b) Mitochondrial and bacterial ribosomal functions are inhibited by the same antibiotics
- c) Presence of circular DNA in Mitochondria
- d) The mitochondrial membrane contains F1-F0 ATPase

Options :

12820641651. A

12820641652. B

12820641653. C

12820641654. D

Question Number : 65 Question Id : 12820610538 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

Which of the following fungi is not an ascomycetes

- a) *Cryptococcus neoformans*
- b) *Candida albicans*
- c) *Aspergillus fumigatus*
- d) *Saccharomyces cerevisiae*

Options :

12820641655. A

12820641656. B

12820641657. C

12820641658. D

Question Number : 66 Question Id : 12820610539 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

Which one among the following is NOT an intracellular pathogen?

- a) *Mycobacterium tuberculosis*
- b) *Rickettsia rickettsii*
- c) *Neisseria gonorrhoeae*
- d) *Streptococcus pyogenes*

Options :

12820641659. A

12820641660. B

12820641661. C

12820641662. D

Question Number : 67 Question Id : 12820610540 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

Which one of the following species of Plasmodium is not capable of infecting humans?

- a) *Plasmodium falciparum*
- b) *Plasmodium vivax*
- c) *Plasmodium berghei*
- d) *Plasmodium malariae*

Options :

12820641663. A

12820641664. B

12820641665. C

12820641666. D

Question Number : 68 Question Id : 12820610541 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

Which one of the following is NOT involved in bacterial conjugation?

- a) Bacteriophage
- b) F+ cells
- c) Plasmids
- d) Sex pili

Options :

12820641667. A

12820641668. B

12820641669. C

12820641670. D

Question Number : 69 Question Id : 12820610542 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

In a given medium, bacteria of strain X have a doubling time of 20 minutes; bacteria of strain Y have a doubling time of 40 minutes. If you start a mixed culture with N cells of X and 16N cells of Y, how long will it take for the culture to have equal numbers of X and Y cells?

- a) 120 min
- b) 160 min
- c) 180 min
- d) 200 min

Options :

12820641671. A

12820641672. B

12820641673. C

12820641674. D

Question Number : 70 Question Id : 12820610543 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

The antibiotic that affects DNA synthesis in bacteria is

- a) Ciprofloxacin
- b) Cloxacillin
- c) Cefazidime
- d) Chloramphenicol

Options :

12820641675. A

12820641676. B

12820641677. C

12820641678. D

Question Number : 71 Question Id : 12820610544 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

Following statements were made regarding columella in plant root?

- i. It constitutes the lowermost layers of cell in the root
- ii. It accumulates high level of auxin
- iii. It accumulates high level of starch
- iv. It helps in geotropism of roots

Choose the correct statements

- a) I and III
- b) I, II, and III
- c) II, III, and IV
- d) I, II, III, and IV

Options :

12820641679. A

12820641680. B

12820641681. C

12820641682. D

Question Number : 72 Question Id : 12820610545 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

Which plant hormone is most important for generating polarity in plants?

- a) Auxin
- b) Cytokinin
- c) Gibberellins
- d) Brassinosteroids

Options :

12820641683. A

12820641684. B

12820641685. C



12820641686. D

Question Number : 73 Question Id : 12820610546 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

Which type of light is mostly reflected from photosynthetically active leaves?

- a) Blue
- b) Red
- c) Infra-red
- d) Green

Options :

12820641687. A

12820641688. B

12820641689. C

12820641690. D

Question Number : 74 Question Id : 12820610547 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

Which of the following features is a criterion to consider two flowering plants to be in the same species?

- a) Their leaves, roots, stem, flowers should look similar
- b) They should be able to freely reproduce with each other
- c) They should have a similar life cycle, nutrient uptake and metabolism
- d) Their genetic content should be highly similar

Options :

12820641691. A

12820641692. B

12820641693. C

12820641694. D

Question Number : 75 Question Id : 12820610548 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

Regrowth of grasses after mowing or grazing by animal is due to which meristem?

- a) Apical
- b) Axial
- c) Intercalary
- d) Vascular

Options :

12820641695. A

12820641696. B

12820641697. C

12820641698. D

Question Number : 76 Question Id : 12820610549 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical



Correct Marks : 1.5 Wrong Marks : 0

Jute comes from which plant tissue?

- a) Xylem fibre
- b) Phloem fibre
- c) Lignified xylem parenchyma
- d) Lignified phloem parenchyma

Options :

- 12820641699. A
- 12820641700. B
- 12820641701. C
- 12820641702. D

Question Number : 77 Question Id : 12820610550 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

The symbiotic nitrogen fixing organism of Actinorhizal plant is:

- a) Azotobacter
- b) Rhizobium
- c) Azolla
- d) Frankia

Options :

- 12820641703. A
- 12820641704. B
- 12820641705. C
- 12820641706. D

Question Number : 78 Question Id : 12820610551 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

Seeds of few plants are grouped into two and placed for germination. Set A, was kept in dark and Set B was kept in light for five days. Two possible outcome and associated reasons are given about seedling phenotype.

- i. Possible outcome 1: Seedlings of Set A will be taller
- ii. Possible outcome 2: Seedlings of Set B will be taller
- iii. Reason 1: Light is required for seed germination
- iv. Reason 2: Light inhibits hypocotyl elongation

Choose the correct outcome and the associated reason

- a) Outcome 1, reason 1
- b) Outcome 1, reason 2
- c) Outcome 2, reason 1
- d) Outcome 2, reason 2

Options :

- 12820641707. A

12820641708. B  
12820641709. C  
12820641710. D

**Question Number : 79 Question Id : 12820610552 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1.5 Wrong Marks : 0**

Identify the correct statement for the retinoblastoma tumour suppressor protein Rb.

- a) Rb is a transcription factor that remains inactive when bound to the regulatory protein E2F
- b) E2F is a transcription factor that remains inactive when bound to Rb.
- c) Upon dissociation from E2F, Rb activates genes for the M phase of cell cycle.
- d) Upon dissociation from Rb, E2F activates genes for the M Phase.

**Options :**

12820641711. A  
12820641712. B  
12820641713. C  
12820641714. D

**Question Number : 80 Question Id : 12820610553 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1.5 Wrong Marks : 0**

Which one among the following is a commonly used for cancer chemotherapy?

- a) Avastin
- b) Tamoxifen
- c) Cisplatin
- d) Herceptin

**Options :**

12820641715. A  
12820641716. B  
12820641717. C  
12820641718. D

**Question Number : 81 Question Id : 12820610554 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1.5 Wrong Marks : 0**

Following statements are made about cancer cells.

- i. Cancer cells are generally resistant to apoptosis
- ii. Inducing apoptosis in cancer cells is a therapeutic strategy for cancer
- iii. Cancer cells and normal cells are equally sensitive to apoptosis
- iv. Therapeutic use of apoptosis for cancer has not yet been explored.

Identify which among the above statements are correct.

- a) iii and iv
- b) i and ii
- c) i and iv
- d) ii and iii

**Options :**

12820641719. A

12820641720. B

12820641721. C

12820641722. D

**Question Number : 82 Question Id : 12820610555 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1.5 Wrong Marks : 0**

Which one among the following is NOT associated with tumor microenvironment?

- a) Hypoxia
- b) Remodeling of extracellular matrix
- c) Dysregulated angiogenesis
- d) Hyperthermia

**Options :**

12820641723. A

12820641724. B

12820641725. C

12820641726. D

**Question Number : 83 Question Id : 12820610556 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1.5 Wrong Marks : 0**

Which of the following histone modifications in the lysine residue can lead to gene silencing?

- a) Crotonylation
- b) Acetylation
- c) Methylation
- d) Ubiquitylation

**Options :**

12820641727. A

12820641728. B

12820641729. C

12820641730. D

Question Number : 84 Question Id : 12820610557 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

Chromatin state mediated gene regulation is directly linked to the metabolic state of the cell through intracellular level of

- a) NAD<sup>+</sup>
- b) ADP
- c) GTP
- d) dNTP

Options :

12820641731. A

12820641732. B

12820641733. C

12820641734. D

Question Number : 85 Question Id : 12820610558 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1.5 Wrong Marks : 0

Enhancer function in transcription is physically blocked between euchromatin and heterochromatin regions by the action of

- a) chromatin loops
- b) the lamin proteins
- c) insulators
- d) the mediator complex

Options :

12820641735. A

12820641736. B

12820641737. C

12820641738. D