

# Andhra Pradesh State Council of Higher Education

## Notations :

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

|                                         |                                     |
|-----------------------------------------|-------------------------------------|
| Question Paper Name :                   | BioTechnology 06th May 2025 Shift 1 |
| Subject Name :                          | Biotechnology                       |
| Creation Date :                         | 2025-05-06 14:10:30                 |
| Duration :                              | 180                                 |
| Total Marks :                           | 200                                 |
| Display Marks:                          | No                                  |
| Share Answer Key With Delivery Engine : | Yes                                 |
| Change Font Color :                     | No                                  |
| Change Background Color :               | No                                  |
| Change Theme :                          | No                                  |
| Help Button :                           | No                                  |
| Show Reports :                          | No                                  |
| Show Progress Bar :                     | No                                  |

## BioTechnology

|                          |          |
|--------------------------|----------|
| Group Number :           | 1        |
| Group Id :               | 89040168 |
| Group Maximum Duration : | 0        |
| Group Minimum Duration : | 180      |
| Show Attended Group? :   | No       |
| Edit Attended Group? :   | No       |
| Break time :             | 0        |
| Group Marks :            | 200      |

## Mathematics

|                         |           |
|-------------------------|-----------|
| Section Id :            | 890401264 |
| Section Number :        | 1         |
| Section type :          | Online    |
| Mandatory or Optional : | Mandatory |

|                                       |           |
|---------------------------------------|-----------|
| Number of Questions :                 | 50        |
| Number of Questions to be attempted : | 50        |
| Section Marks :                       | 50        |
| Maximum Instruction Time :            | 0         |
| Sub-Section Number :                  | 1         |
| Sub-Section Id :                      | 890401284 |
| Question Shuffling Allowed :          | Yes       |

Question Number : 1 Question Id : 89040113411 Question Type : MCQ Option Shuffling : No  
 Display Question Number : Yes  
 Correct Marks : 1 Wrong Marks : 0

If the matrix  $A = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$ , then which of the following is true?

Options :

1. ✖ *The matrix is invertible*
2. ✔ *The matrix is singular*
3. ✖ *The matrix is diagonalizable*
4. ✖ *The matrix is symmetric.*

Question Number : 2 Question Id : 89040113412 Question Type : MCQ Option Shuffling : No  
 Display Question Number : Yes  
 Correct Marks : 1 Wrong Marks : 0

If  $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$ , and the determinant of  $A$  is 5, then determinant of the matrix  $2A$  is

Options :

1. ✖ 10
2. ✔ 20
3. ✖ 5

4. ✖ 25

Question Number : 3 Question Id : 89040113413 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If the matrix A is of order  $3 \times 3$  and the system of equations  $AX = B$  has a unique solution, what can be concluded about the determinant of A?

Options :

1. ✖ The determinant of A is zero
2. ✔ The determinant of A is non-zero
3. ✖ The determinant of A must be 1 only
4. ✖ The determinant of A cannot be negative

Question Number : 4 Question Id : 89040113414 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If  $A = \begin{bmatrix} x & 3 \\ 2 & 4 \end{bmatrix}$  and  $A^{-1} = \begin{bmatrix} -2 & 1.5 \\ 1 & -0.5 \end{bmatrix}$  then the value of x is

Options :

1. ✖ -2
2. ✔ 1
3. ✖ 1.5
4. ✖ -0.5

Question Number : 5 Question Id : 89040113415 Question Type : MCQ Option Shuffling : No

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If  $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$  and  $B = \begin{bmatrix} 1 & 0 \\ 1 & 0 \end{bmatrix}$ , then  $(AB)^T =$

Options :

1. ✖  $\begin{bmatrix} 0 & 0 \\ 3 & 4 \end{bmatrix}$

2. ✖  $\begin{bmatrix} 0 & 0 \\ 3 & 7 \end{bmatrix}$

3. ✔  $\begin{bmatrix} 3 & 7 \\ 0 & 0 \end{bmatrix}$

4. ✖  $\begin{bmatrix} 3 & 6 \\ 0 & 0 \end{bmatrix}$

Question Number : 6 Question Id : 89040113416 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If  $\frac{2x+5}{(x-1)(x+3)} = \frac{A}{(x-1)} + \frac{B}{(x+3)}$  then  $A+B =$

Options :

1. ✖  $-2$

2. ✔  $2$

3. ✖  $1$

4. ✖  $-1$

Question Number : 7 Question Id : 89040113417 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If  $\frac{3x-1}{(x-1)(x-2)(x-3)} = \frac{A}{(x-1)} + \frac{B}{(x-2)} + \frac{C}{(x-3)}$  then the values of (A, B, C) are

Options :

1. ✓ (1, -5, 4)

2. ✗ (1, 5, 4)

3. ✗ (4, 5, 1)

4. ✗ (1, 4, 5)

Question Number : 8 Question Id : 89040113418 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If  $\sin \theta = \frac{3}{5}$ , then  $\cos \theta =$

Options :

1. ✗  $\frac{4}{5}$  but not  $-\frac{4}{5}$

2. ✓  $-\frac{4}{5}$  or  $\frac{4}{5}$

3. ✗  $-\frac{4}{5}$  but not  $\frac{4}{5}$

4. ✗  $\frac{3}{5}$  but not  $-\frac{3}{5}$

Question Number : 9 Question Id : 89040113419 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If  $\cos \theta \operatorname{cosec} \theta = -1$  and  $\theta$  lies in the second quadrant then  $\cos \theta =$

Options :

1. ✗

$$\frac{-\sqrt{3}}{2}$$

2. ✖  $\frac{\sqrt{2}}{2}$

3. ✔  $-\frac{\sqrt{2}}{2}$

4. ✖  $-\sqrt{2}$

Question Number : 10 Question Id : 89040113420 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If  $5 \sin \theta = 4$  then the value of  $\frac{\operatorname{Cosec} \theta - \cot \theta}{\operatorname{Cosec} \theta + \cot \theta}$  is

Options :

1. ✖  $-1/4$

2. ✖  $-1/2$

3. ✖  $1/2$

4. ✔  $1/4$

Question Number : 11 Question Id : 89040113421 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

For real x and if  $x + \frac{1}{x} = 2 \cos \theta$  then  $\cos \theta$  is

Options :

1. ✔  $\pm 1$

2. ✖  $1/2$

3. ✖ 1

4. ✖  $\pm \frac{1}{2}$

Question Number : 12 Question Id : 89040113422 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$$\sin^6 \theta + \cos^6 \theta + 3\sin^2 \theta \cos^2 \theta =$$

Options :

1. ✖ 0

2. ✔ 1

3. ✖ 2

4. ✖ -1

Question Number : 13 Question Id : 89040113423 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The maximum value of  $3 \cos \theta + 4 \sin \theta$  is

Options :

1. ✖ 2

2. ✖ 4

3. ✔ 5

4. ✖ 1

Question Number : 14 Question Id : 89040113424 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

If  $\sin 5x + \sin 3x + \sin x = 0$  then the value of  $x$  other than zero lying between  $0 \leq x \leq \frac{\pi}{2}$  is

Options :

1. ✖  $\frac{\pi}{6}$

2. ✔  $\frac{\pi}{3}$

3. ✖  $\frac{\pi}{12}$

4. ✖  $\frac{\pi}{4}$

Question Number : 15 Question Id : 89040113425 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

The general solution of the equation  $\tan^2 x = 1$  is

Options :

1. ✖  $n\pi + \frac{\pi}{4}$  only

2. ✔  $n\pi \pm \frac{\pi}{4}$

3. ✖  $2n\pi \pm \frac{\pi}{4}$

4. ✖  $n\pi - \frac{\pi}{4}$  only

Question Number : 16 Question Id : 89040113426 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The value of  $\cos \frac{5\pi}{17} + \cos \frac{7\pi}{17} + 2\cos \frac{11\pi}{17} \cos \frac{\pi}{17}$  is

Options :

- 1. ✓ 0
- 2. ✗ 1
- 3. ✗ -1
- 4. ✗  $1/2$

Question Number : 17 Question Id : 89040113427 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If  $\sin \theta - \cos \theta = 4/5$  then the value of  $\sin \theta + \cos \theta =$

Options :

- 1. ✗  $\frac{5}{\sqrt{34}}$
- 2. ✗  $-\frac{5}{\sqrt{34}}$
- 3. ✗  $-\frac{\sqrt{34}}{25}$
- 4. ✓  $\frac{\sqrt{34}}{5}$

Question Number : 18 Question Id : 89040113428 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The real part of  $\frac{1+2i}{(2-i)^2}$  is

Options :

1. ✓  $-\frac{1}{5}$

2. ✗  $\frac{1}{5}$

3. ✗  $-\frac{2}{5}$

4. ✗  $\frac{2}{5}$

Question Number : 19 Question Id : 89040113429 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Modulus of the complex number  $\frac{(1+i)^{10}}{(2i-4)^4}$  is equal to

Options :

1. ✓  $\frac{2}{25}$

2. ✗  $-\frac{2}{25}$

3. ✗  $\frac{1}{25}$

4. ✗  $-\frac{1}{25}$

Question Number : 20 Question Id : 89040113430 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In a circle with center O, a 6cm long chord is at a distance 4 cm from the center.

Then the length of diameter is

Options :

1. ✖ 5 cm

2. ✔ 10 cm

3. ✖ 15 cm

4. ✖ 8 cm

**Question Number : 21 Question Id : 89040113431 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

The length of the tangent from the point  $(5, 1)$  to the circle  $x^2 + y^2 + 6x - 4y - 3 = 0$  is

**Options :**

1. ✖ 81

2. ✔ 7

3. ✖ 29

4. ✖ 21

**Question Number : 22 Question Id : 89040113432 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

If length of the tangent is 8 cm and the distance between the center of the circle and the external point is 11 cm, then the area of the circle is

**Options :**

1. ✖ 100 cm

2. ✖ 197.14 cm

3. ✓ 179.14 cm

4. ✗ 110.14 cm

Question Number : 23 Question Id : 89040113433 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

The equation of the parabola with focus (2, 0) and vertex (1, 0) is

Options :

1. ✗  $y^2 = 4x$

2. ✓  $y^2 = 4x - 4$

3. ✗  $y^2 = 4(x + 1)$

4. ✗  $y^2 = -4(x - 1)$

Question Number : 24 Question Id : 89040113434 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

If (2,0) is the vertex and y-axis is the directrix of a parabola then its focus is

Options :

1. ✗ (2, 0)

2. ✗ (-2, 0)

3. ✓ (4, 0)

4. ✗ (-4, 0)

Question Number : 25 Question Id : 89040113435 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

The *eccentricity* of the ellipse  $16x^2 + 7y^2 = 112$  is

Options :

1. ✖  $\frac{4}{3}$

2. ✖  $\frac{7}{16}$

3. ✖  $\frac{3}{\sqrt{7}}$

4. ✔  $\frac{3}{4}$

Question Number : 26 Question Id : 89040113436 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

The value of  $\lim_{n \rightarrow \infty} \frac{4x^3 - x + 1}{x^2 - 4x(1 - x^2)} =$

Options :

1. ✖ 0

2. ✔ 1

3. ✖ -1

4. ✖  $\infty$

Question Number : 27 Question Id : 89040113437 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The value of  $\lim_{x \rightarrow 1} \left( \frac{x^3 - 1}{x - 1} \right)$  is

Options :

1. ✖ 0
2. ✖ 1
3. ✔ 3
4. ✖ Limit does not exist

Question Number : 28 Question Id : 89040113438 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The derivative of  $x^x$  with respect to  $x$  is

Options :

1. ✖  $x^x(x + \log x)$
2. ✖  $x^x(x - \log x)$
3. ✖  $x^x(1 - \log x)$
4. ✔  $x^x(1 + \log x)$

Question Number : 29 Question Id : 89040113439 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$\frac{d}{dx} \left( \tan^{-1} \frac{x}{a} \right) =$

Options :

1. ✖  $\frac{a}{a^2-x^2}$

2. ✖  $\frac{1}{a^2+x^2}$

3. ✖  $\frac{1}{a^2-x^2}$

4. ✔  $\frac{a}{a^2+x^2}$

Question Number : 30 Question Id : 89040113440 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If  $y = \sqrt{\sin x + \sqrt{\sin x + \sqrt{\sin x + \dots \infty}}}$  then  $\frac{dy}{dx} =$

Options :

1. ✖  $\frac{\cos x}{1-2y}$

2. ✖  $\frac{\sin x}{1-2y}$

3. ✖  $\frac{-\sin x}{1-2y}$

4. ✔  $\frac{-\cos x}{1-2y}$

Question Number : 31 Question Id : 89040113441 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Slope of the normal to the curve  $x^{2/3} + y^{2/3} = 2$  at the point (1, 1) is

Options :

1. ✖  $-1$

2. ✔  $1$

3. ✖  $1/2$

4. ✖  $-1/2$

Question Number : 32 Question Id : 89040113442 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The equation of the tangent to the curve  $y = x^3$  at  $(1, 1)$  is

Options :

1. ✖  $3x - y + 2 = 0$

2. ✖  $x - 10y - 50 = 0$

3. ✔  $3x - y - 2 = 0$

4. ✖  $x - 10y + 50 = 0$

Question Number : 33 Question Id : 89040113443 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

For what value of  $x$ , the function  $2x^3 + 3x^2 - 36x + 10$  has minimum

Options :

1. ✖  $-2$

2. ✖  $-3$

3. ✔

4. ✖ 1

Question Number : 34 Question Id : 89040113444 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If  $z = x^2 - y^2$  then  $\frac{1}{x} \frac{\partial z}{\partial x} + \frac{1}{y} \frac{\partial z}{\partial y} =$

Options :

1. ✖ 1

2. ✖  $2x + 2y$ 

3. ✔ 0

4. ✖  $2x - 2y$ 

Question Number : 35 Question Id : 89040113445 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If  $u = e^{xy}$ , then the value of  $\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2}$  at  $(1, 1)$  is

Options :

1. ✖  $e$ 2. ✔  $2e$ 

3. ✖ 1

4. ✖ 0

Question Number : 36 Question Id : 89040113446 Question Type : MCQ Option Shuffling : No

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The value of  $\int (\log \sec x) \tan x \, dx$  is

Options :

1. ✖  $\sec x + c$

2. ✖  $\log \sec x + c$

3. ✔  $\frac{1}{2} (\log \sec x)^2 + c$

4. ✖  $\log (\log \sec x)$

Question Number : 37 Question Id : 89040113447 Question Type : MCQ Option Shuffling : No

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$$\int \sin^2 x \, dx =$$

Options :

1. ✖  $\frac{x}{2} + \frac{\sin 2x}{4} + c$

2. ✖  $\frac{x}{2} - \frac{\cos 2x}{4} + c$

3. ✖  $\frac{x}{2} + \frac{\cos 2x}{4} + c$

4. ✔  $\frac{x}{2} - \frac{\sin 2x}{4} + c$

Question Number : 38 Question Id : 89040113448 Question Type : MCQ Option Shuffling : No

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$$\int \frac{dx}{25-x^2} =$$

Options :

1. ✖  $\frac{1}{5} \log \left| \frac{x-5}{x+5} \right| + c$

2. ✖  $\frac{1}{5} \log \left| \frac{x+5}{x-5} \right| + c$

3. ✔  $\frac{1}{10} \log \left| \frac{5+x}{5-x} \right| + c$

4. ✖  $\frac{1}{10} \log \left| \frac{5-x}{5+x} \right| + c$

Question Number : 39 Question Id : 89040113449 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The value of  $\int_0^1 x(1-x)^9 dx$  is

Options :

1. ✔  $\frac{1}{110}$

2. ✖  $\frac{1}{120}$

3. ✖  $\frac{-1}{110}$

4. ✖  $\frac{-1}{120}$

Question Number : 40 Question Id : 89040113450 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$$\int_{-a}^a |x| \, dx =$$

Options :

1. ✖  $a$

2. ✖  $2a$

3. ✖  $0$

4. ✔  $a^2$

Question Number : 41 Question Id : 89040113451 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$$\int_0^{\pi/2} \frac{\cos 2x}{\sin x + \cos x} \, dx =$$

Options :

1. ✖  $-1$

2. ✔  $0$

3. ✖  $1$

4. ✖  $\frac{\pi}{2}$

Question Number : 42 Question Id : 89040113452 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The area bounded by the curve  $y = 4x^2$ , the x-axis, the line  $x=0$  and the line  $x = 1$  is

Options :

1. ✖  $2$

2. ✖  $\frac{2}{3}$

3. ✖  $\frac{1}{3}$

4. ✔  $\frac{4}{3}$

Question Number : 43 Question Id : 89040113453 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The RMS value of  $x^2$  in  $[0, 1]$  is

Options :

1. ✔  $\frac{1}{\sqrt{5}}$

2. ✖  $\frac{1}{5}$

3. ✖  $\frac{1}{\sqrt{3}}$

4. ✖  $\frac{1}{3}$

Question Number : 44 Question Id : 89040113454 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The degree of the differential equation  $y' + y = \frac{5}{y'}$  is

Options :

1. ✖ 1

2. ✔ 2

3. ✖ 3

4. ✖ 4

**Question Number : 45 Question Id : 89040113455 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

The order of the differential equation whose general solution is  $y = a \sin x + b \cos x$  is

( where a and b are arbitrary constants)

**Options :**

1. ✔ 2

2. ✖ 4

3. ✖ 1

4. ✖ 3

**Question Number : 46 Question Id : 89040113456 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

The differential equation  $\frac{dy}{dx} = -\left(\frac{x+y}{1+x^2}\right)$  is

**Options :**

1. ✖ of Variable separable form

2. ✔ First order Linear equation

3. ✖ Homogeneous

4. ✖ Exact differentia Equation

Question Number : 47 Question Id : 89040113457 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

The solution of the differential equation  $\frac{dy}{dx} = 1 + y^2$  is

Options :

1. ✖  $y = \tan x + c$
2. ✔  $y = \tan (x + c)$
3. ✖  $y = \tan x$
4. ✖  $y = -\tan (x + c)$

Question Number : 48 Question Id : 89040113458 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

The solution of the differential equation  $\frac{dy}{dx} + \frac{y}{x} = x^2$  under the condition that  $y(1) = 1$  is

Options :

1. ✖  $4xy = x^3 + 3$
2. ✔  $4xy = x^4 + 3$
3. ✖  $4xy = x^3 - 3$
4. ✖  $4xy = x^4 - 3$

Question Number : 49 Question Id : 89040113459 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The solution of the differential equation  $\frac{d^3y}{dx^3} + 3\frac{d^2y}{dx^2} + 2\frac{dy}{dx} = 0$  is

Options :

1. ✓  $y = a + be^{-x} + ce^{-2x}$
2. ✗  $y = a + be^x + ce^{2x}$
3. ✗  $y = ae^{-x} + be^{-2x} + ce^x$
4. ✗  $y = a + be^{-2x} + ce^{-3x}$

Question Number : 50 Question Id : 89040113460 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The particular integral of  $\frac{d^2y}{dx^2} + 3\frac{dy}{dx} + 2y = e^{-2x}$  is

Options :

1. ✓  $-xe^{-2x}$
2. ✗  $xe^{-2x}$
3. ✗  $-\frac{x}{2}e^{-2x}$
4. ✗  $\frac{x}{2}e^{-2x}$

## Physics

Section Id :

890401265

Section Number :

2

Section type :

Online

Mandatory or Optional :

Mandatory

|                                       |           |
|---------------------------------------|-----------|
| Number of Questions :                 | 25        |
| Number of Questions to be attempted : | 25        |
| Section Marks :                       | 25        |
| Maximum Instruction Time :            | 0         |
| Sub-Section Number :                  | 1         |
| Sub-Section Id :                      | 890401285 |
| Question Shuffling Allowed :          | Yes       |

Question Number : 51 Question Id : 89040113461 Question Type : MCQ Option Shuffling : No  
 Display Question Number : Yes  
 Correct Marks : 1 Wrong Marks : 0

If we choose velocity  $V$ , length  $L$  and force  $F$  as fundamental physical quantities then how would you express power in terms of  $V$ ,  $L$  and  $F$  ?

Options :

1. ✓  $F^1 L^0 V^1$
2. ✗  $F^1 L^{-1} V^1$
3. ✗  $F^1 L^{-1} V^2$
4. ✗  $F^1 L^{-2} V^3$

Question Number : 52 Question Id : 89040113462 Question Type : MCQ Option Shuffling : No  
 Display Question Number : Yes  
 Correct Marks : 1 Wrong Marks : 0

Which pair of physical quantities have same dimensional formula

Options :

1. ✗ Torque and momentum
2. ✗ Surface tension and tension
3. ✓ Pressure and modulus of elasticity
4. ✗ Force constant and Planck's constant

Question Number : 53 Question Id : 89040113463 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If  $A + B = C$  and  $A^2 + B^2 = C^2$  then the angle between vectors A and B is

Options :

1. ✖  $0^\circ$
2. ✖  $60^\circ$
3. ✔  $90^\circ$
4. ✖  $120^\circ$

Question Number : 54 Question Id : 89040113464 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The area of rectangle with sides as  $A = 3i + 4j$  and  $B = i + 3j$  is

Options :

1. ✔  $5\sqrt{10}$  units
2. ✖ 10 units
3. ✖  $2\sqrt{10}$  units
4. ✖  $10\sqrt{5}$  units

Question Number : 55 Question Id : 89040113465 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If a pebble is thrown vertically upwards from the top of a tower with velocity 5 m/s. It strikes the ground after 3 seconds. With what velocity the pebble strikes the ground? (take  $g = 10 \text{ ms}^{-2}$ )

**Options :**

- 1. ✖ 10 m/s
- 2. ✖ 20 m/s
- 3. ✔ 25 m/s
- 4. ✖ 30 m/s

**Question Number : 56 Question Id : 89040113466 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

If a body released from the top of a tower of height H meter takes T seconds to reach the ground , where is the body at time T/2 seconds from the ground ?

**Options :**

- 1. ✖  $\frac{H}{2}$
- 2. ✖  $\frac{H}{4}$
- 3. ✔  $\frac{3H}{4}$
- 4. ✖  $\frac{2H}{3}$

**Question Number : 57 Question Id : 89040113467 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

A body starts from rest and travels with uniform acceleration. If the distance covered in first 2 seconds is 'x' and next 2 seconds is 'y', then

**Options :**

1. ✖  $y = x$
2. ✖  $y = 2x$
3. ✔  $y = 3x$
4. ✖  $y = 4x$

**Question Number : 58 Question Id : 89040113468 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

A juggler throws ball into air. He throws one whenever the previous one is at its highest point. How high do the balls rise if he throws n balls each second ?

**Options :**

1. ✔  $\frac{g}{2n^2}$
2. ✖  $\frac{g}{n}$
3. ✖  $\frac{g}{2n}$
4. ✖  $\frac{n^2}{g}$

**Question Number : 59 Question Id : 89040113469 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

A block of mass  $m$  is lying on an inclined plane. The coefficient of friction between the plane and the block is  $\mu$ . The force required to move the block up the inclined plane will be

**Options :**

1. ✖  $mg \sin \theta - \mu mg \cos \theta$
2. ✔  $mg \sin \theta + \mu mg \cos \theta$
3. ✖  $mg \cos \theta - \mu mg \sin \theta$
4. ✖  $mg \cos \theta + \mu mg \sin \theta$

**Question Number : 60 Question Id : 89040113470 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

The time taken by a body to slide down the smooth inclined plane is 4sec. The time taken by a body to slide  $1/4^{\text{th}}$  of the length of the plane is

**Options :**

1. ✖ 1 sec
2. ✔ 2 sec
3. ✖ 3 sec
4. ✖ 0.5 sec.

**Question Number : 61 Question Id : 89040113471 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

A body of mass 2 Kg changes its velocity from  $(3\mathbf{i} - 4\mathbf{j})$  m/s to  $(6\mathbf{j} + 2\mathbf{k})$  m/s.

what is the change in kinetic energy of the body?

**Options :**

- 1. ✓ 15 J
- 2. ✗ 12 J
- 3. ✗ 18 J
- 4. ✗ 20 J

**Question Number : 62 Question Id : 89040113472 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

At her maximum height a girl in a swing is 3m above the ground and at the lowest point she is 2m above the ground. Her maximum velocity is

**Options :**

- 1. ✗  $\sqrt{29.4}$  m/s
- 2. ✗  $\sqrt{9.8}$  m/s
- 3. ✓  $\sqrt{19.6}$  m/s
- 4. ✗ 9.8 m/s

**Question Number : 63 Question Id : 89040113473 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

An engine delivers 1000 watt of power with 80% efficiency. The input power is

**Options :**

1. ✖ 800 W

2. ✖ 1000 W

3. ✔ 1250 W

4. ✖ 1500 W

**Question Number : 64 Question Id : 89040113474 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

If a seconds pendulum on the earth is taken to a planet whose gravity is half of the gravity on earth, its time period on that planet is

**Options :**

1. ✖ 2 sec

2. ✖ 4 sec

3. ✖  $4\sqrt{2}$  sec

4. ✔  $2\sqrt{2}$  sec

**Question Number : 65 Question Id : 89040113475 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

The amplitude of a simple harmonic oscillator is A. When the velocity of particle is half of its maximum velocity, then its position is at

**Options :**

1. ✖  $\frac{A}{2}$

2. ✖

$$\frac{\sqrt{3} A}{4}$$

3. ✖  $\frac{A}{4}$

4. ✔  $\frac{\sqrt{3} A}{2}$

Question Number : 66 Question Id : 89040113476 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The displacement of a particle executing SHM is  $x = 3 \sin 2t + 4 \cos 2t$ .

The amplitude of particle is

Options :

1. ✖ 7

2. ✖ 3

3. ✖ 4

4. ✔ 5

Question Number : 67 Question Id : 89040113477 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The beats are produced by two sound sources of same amplitude and of nearly equal frequencies. The maximum intensity of beats will be \_\_\_\_\_ when compared to that of one source is

Options :

1. ✖ Same

2. ✖ Double

3. ✓ Four times

4. ✗ Eight times

**Question Number : 68 Question Id : 89040113478 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

A siren emitting sound of frequency 800 Hz is going away from a static listener with a speed of 30 m/s. Frequency of sound heard by the listener is  
(Velocity of sound in air = 340 m/s)

**Options :**

1. ✗ 286.5 Hz

2. ✗ 418.2 Hz

3. ✓ 733.3 Hz

4. ✗ 644.5 Hz

**Question Number : 69 Question Id : 89040113479 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

During the melting of a slab of ice at 273K at atmospheric pressure

**Options :**

1. ✗ Positive work is done by the ice-water system on the atmosphere

2. ✓ Positive work is done on the ice-water system by the atmosphere

3. ✗ Negative work is done on the ice-water system by the atmosphere

4. ✗ The internal energy of the ice-water system decreases

Question Number : 70 Question Id : 89040113480 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A gas is compressed at a constant pressure of  $50 \text{ N/m}^2$  from a volume of  $10 \text{ m}^3$  to a volume of  $4 \text{ m}^3$ . Energy of 100 J is then added to the gas by heating. Its internal energy is

Options :

1. ✓ Increases by 400 J
2. ✗ Increases by 200 J
3. ✗ Increases by 100 J
4. ✗ Decreases by 200 J

Question Number : 71 Question Id : 89040113481 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A vessel containing 10 liters of an ideal gas at a pressure of 760 mm of Hg is connected to an evacuated 9 liter vessel. The resultant pressure is

Options :

1. ✓ 400 mm of Hg
2. ✗ 1440 mm of Hg
3. ✗ 40 mm of Hg
4. ✗ 760 mm of Hg

Question Number : 72 Question Id : 89040113482 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

**Correct Marks : 1 Wrong Marks : 0**

A sealed glass jar is full of water. When its temperature is decreased to  $0^{\circ}\text{C}$

**Options :**

1. ✖ The glass jar remains as it is with ice
2. ✖ The glass jar remains as it is with water
3. ✖ Glass jar contains half the amount of ice mixed with water
4. ✔ The glass jar breaks due to the formation of ice

**Question Number : 73 Question Id : 89040113483 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

A bubble rises from the bottom of a lake 90 m deep on reaching the surface, its volume becomes ( Atmospheric pressure is 10 m of water)

**Options :**

1. ✖ 4 times
2. ✖ 8 times
3. ✔ 10 times
4. ✖ 3 times

**Question Number : 74 Question Id : 89040113484 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

An endoscope is employed by a physician to view the internal parts of a body organ. It is based on the principle of

**Options :**

1. ✖ Refraction
2. ✖ Reflection
3. ✖ Dispersion
4. ✔ Total internal reflection

**Question Number : 75 Question Id : 89040113485 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

Light of wavelength  $5000 \text{ \AA}$  falls on a sensitive plate with photo electric work function of  $1.9 \text{ eV}$ . The kinetic energy of the emitted photoelectron will be

**Options :**

1. ✔  $0.58 \text{ eV}$
2. ✖  $2.48 \text{ eV}$
3. ✖  $1.24 \text{ eV}$
4. ✖  $1.16 \text{ eV}$

## Chemistry

|                                       |           |
|---------------------------------------|-----------|
| Section Id :                          | 890401266 |
| Section Number :                      | 3         |
| Section type :                        | Online    |
| Mandatory or Optional :               | Mandatory |
| Number of Questions :                 | 25        |
| Number of Questions to be attempted : | 25        |
| Section Marks :                       | 25        |
| Maximum Instruction Time :            | 0         |
| Sub-Section Number :                  | 1         |
| Sub-Section Id :                      | 890401286 |

Question Shuffling Allowed :

Yes

Question Number : 76 Question Id : 89040113486 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Consider the elements with atomic numbers  $Z = 1$  to  $Z=20$ . The number of elements with only one unpaired electron in their ground state is

Options :

1. ✖ 10

2. ✖ 6

3. ✔ 8

4. ✖ 12

Question Number : 77 Question Id : 89040113487 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Identify the orbital which has lobes not orienting on the axis

Options :

1. ✖  $P_x$

2. ✖  $P_y$

3. ✖  $d_{x^2-y^2}$

4. ✔  $d_{yz}$

Question Number : 78 Question Id : 89040113488 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If  $n$ ,  $l$ ,  $m$  and  $s$  represent the symbols of quantum numbers, the impossible quantum number set for the electron in terms of  $n$ ,  $l$ ,  $m$  and  $s$  respectively is

**Options :**

1. ✓ 2, 0, -1, +1/2

2. ✗ 3, 0, 0, -1/2

3. ✗ 4, 1, +1, +1/2

4. ✗ 3, 2, -1, -1/2

**Question Number : 79 Question Id : 89040113489 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

Consider the elements with atomic numbers  $Z = 8, 9, 11, 19$  and  $20$ . The number of ionic compounds possible with the elements having these atomic numbers is

**Options :**

1. ✓ 6

2. ✗ 5

3. ✗ 10

4. ✗ 8

**Question Number : 80 Question Id : 89040113490 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

In which of the molecules lone pair, bond pair of electrons ratio is 2:3 ?

**Options :**

1. ✖  $Cl_2$

2. ✖  $O_2$

3. ✖  $HCl$

4. ✔  $N_2$

Question Number : 81 Question Id : 89040113491 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

How many moles of urea is present in 250 ml of 0.2 M solution of it?

Options :

1. ✖ 0.03

2. ✖ 0.04

3. ✔ 0.05

4. ✖ 0.06

Question Number : 82 Question Id : 89040113492 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

$x$  ml of 0.1 M NaOH solution is diluted with distilled water to get 250 ml of 0.01 M solution.

The value of  $x$  (in ml) is

Options :

1. ✖ 12.5

2. ✔ 25

3. ✖ 37.5

4. ✖ 50

Question Number : 83 Question Id : 89040113493 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$3 \times 10^{22}$  molecules of  $\text{Na}_2\text{CO}_3$  (molecular weight = 106 ) present in 500 ml of solution.

The normality of the solution formed is ( $N = 6 \times 10^{23} \text{ mol}^{-1}$ )

Options :

1. ✖ 0.1 N

2. ✔ 0.2 N

3. ✖ 0.4 N

4. ✖ 0.05 N

Question Number : 84 Question Id : 89040113494 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Identify the pair containing only Lewis acids

Options :

1. ✔  $\text{BF}_3$ ,  $\text{NH}_3$

2. ✖  $\text{H}^+$ ,  $\text{BF}_3$

3. ✖  $\text{F}^-$ ,  $\text{H}_2\text{O}$

4. ✖  $\text{NH}_4^+$ ,  $\text{NH}_3$

Question Number : 85 Question Id : 89040113495 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

4 g of NaOH is dissolved in 1.0 L solution. The pH of solution is

Options :

1. ✓ 13

2. ✗ 1

3. ✗ 12

4. ✗ 7.4

Question Number : 86 Question Id : 89040113496 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

Number of coulombs corresponding to 1 mol of electrons approximately is equal to

Options :

1. ✗  $1.93 \times 10^5$

2. ✓  $9.65 \times 10^4$

3. ✗  $1.93 \times 10^4$

4. ✗  $9.65 \times 10^5$

Question Number : 87 Question Id : 89040113497 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

Aqueous solution of which of the following does not act as electrolyte?

**Options :**

1. ✓ Urea
2. ✗ Copper Sulphate
3. ✗ Silver Nitrate
4. ✗ Sodium Chloride

**Question Number : 88 Question Id : 89040113498 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

The amount of silver (in mg) deposited when 9.65 coulombs of electricity is passed through an aqueous solution of silver nitrate is ( $\text{Ag}=108 \text{ u}$ ) ( $1\text{F}=96500 \text{ C mol}^{-1}$ )

**Options :**

1. ✗ 16.2
2. ✗ 21.2
3. ✓ 10.8
4. ✗ 6.4

**Question Number : 89 Question Id : 89040113499 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

The standard electrode potentials of Zn, Ag and Cu are -0.76, +0.80 and +0.34 V respectively. Identify the correct statement from the following.

**Options :**

1. ✗ Ag can oxidize Zn and Cu

2. ✖ Ag can reduce  $\text{Zn}^{2+}$  and  $\text{Cu}^{2+}$
3. ✔ Zn can reduce  $\text{Ag}^+$  and  $\text{Cu}^{2+}$
4. ✖ Cu can oxidize Zn and Ag

**Question Number : 90 Question Id : 89040113500 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

In the removal of permanent hardness of water by permutit process,  $\text{Na}^+$  ions of permutit are exchanged with which ions of water ?

**Options :**

1. ✖  $\text{K}^+$ ,  $\text{Ba}^{2+}$
2. ✖  $\text{Fe}^{2+}$ ,  $\text{K}^+$
3. ✔  $\text{Ca}^{2+}$ ,  $\text{Mg}^{2+}$
4. ✖  $\text{Zn}^{2+}$ ,  $\text{Cu}^{2+}$

**Question Number : 91 Question Id : 89040113501 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

What is the degree of hardness (in ppm) of a sample containing 19 mg of  $\text{MgCl}_2$  (Molecular Weight = 95) in 2 kg water sample?  
(express it in terms of equivalents of  $\text{CaCO}_3$ )

**Options :**

1. ✔ 10
2. ✖ 20

3. ✖ 30

4. ✖ 40

Question Number : 92 Question Id : 89040113502 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Identify the pair of chlorides responsible for permanent hardness of water.

Options :

1. ✖ NaCl, KCl

2. ✖ CaCl<sub>2</sub>, KCl

3. ✖ AlCl<sub>3</sub>, MgCl<sub>2</sub>

4. ✔ MgCl<sub>2</sub>, CaCl<sub>2</sub>

Question Number : 93 Question Id : 89040113503 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The cell formed in bent pipes is an example of

Options :

1. ✖ Concentration Cell

2. ✖ Composition Cell

3. ✔ Stress Cell

4. ✖ Electrolytic Cell

Question Number : 94 Question Id : 89040113504 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Tarnishing of silver is due to formation of

Options :

1. ✖ Its sulphate layer
2. ✖ Its nitrate layer
3. ✔ Its sulphide layer
4. ✖ Its chloride layer

Question Number : 95 Question Id : 89040113505 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following is not a co-polymer?

Options :

1. ✖ Buna-S rubber
2. ✔ Neoprene rubber
3. ✖ Bakelite
4. ✖ Urea – Formaldehyde

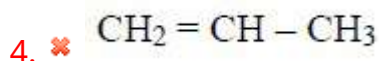
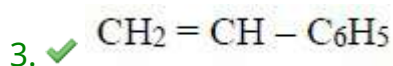
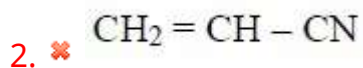
Question Number : 96 Question Id : 89040113506 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The monomer involved in the formation of polystyrene is

Options :

1. ✖  $\text{CH}_2 = \text{CH} - \text{Cl}$

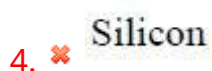
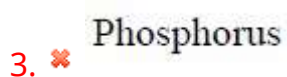
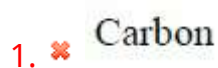


Question Number : 97 Question Id : 89040113507 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

We can overcome the undesirable properties of natural rubber by heating natural rubber with

Options :

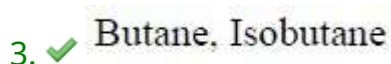
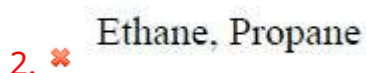
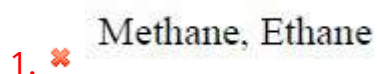


Question Number : 98 Question Id : 89040113508 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Liquefied petroleum gas (LPG) mainly contains

Options :



4. ✖ Ethene, Ethyne

Question Number : 99 Question Id : 89040113509 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Greenhouse effect is caused by

Options :

1. ✖ NO<sub>2</sub>

2. ✖ CO

3. ✖ NO

4. ✔ CO<sub>2</sub>

Question Number : 100 Question Id : 89040113510 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which compound is mainly responsible for the depletion of ozone layer?

Options :

1. ✖ CO<sub>2</sub>

2. ✖ CH<sub>4</sub>

3. ✖ CH<sub>3</sub>OH

4. ✔ CF<sub>2</sub>Cl<sub>2</sub>

|                                              |           |
|----------------------------------------------|-----------|
| <b>Section Number :</b>                      | 4         |
| <b>Section type :</b>                        | Online    |
| <b>Mandatory or Optional :</b>               | Mandatory |
| <b>Number of Questions :</b>                 | 100       |
| <b>Number of Questions to be attempted :</b> | 100       |
| <b>Section Marks :</b>                       | 100       |
| <b>Maximum Instruction Time :</b>            | 0         |
| <b>Sub-Section Number :</b>                  | 1         |
| <b>Sub-Section Id :</b>                      | 890401287 |
| <b>Question Shuffling Allowed :</b>          | Yes       |

**Question Number : 101 Question Id : 89040113511 Question Type : MCQ Option Shuffling : No**  
**Display Question Number : Yes**  
**Correct Marks : 1 Wrong Marks : 0**

The permeability of a membrane is largely dependent on:

**Options :**

1. ✓ Phospholipid composition

2. ✗ Cell wall thickness

3. ✗ Mitochondrial DNA

4. ✗ Nucleosome structure

**Question Number : 102 Question Id : 89040113512 Question Type : MCQ Option Shuffling : No**  
**Display Question Number : Yes**  
**Correct Marks : 1 Wrong Marks : 0**

The Crabtree effect in yeast occurs due to:

**Options :**

1. ✗ High oxygen concentration

2. ✓ High glucose concentration

3. ✖ Low pH

4. ✖ Presence of antibiotics

**Question Number : 103 Question Id : 89040113513 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

In a dihybrid cross, the phenotypic ratio of the F<sub>2</sub> generation follows:

**Options :**

1. ✔ 9:3:3:1

2. ✖ 3:1

3. ✖ 1:1:1:1

4. ✖ 1:2:1

**Question Number : 104 Question Id : 89040113514 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

Which enzyme is used to break hydrogen bonds during DNA replication?

**Options :**

1. ✖ Ligase

2. ✔ Helicase

3. ✖ Polymerase

4. ✖ Exonuclease

Question Number : 105 Question Id : 89040113515 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Gram-positive bacteria differ from Gram-negative bacteria in having:

Options :

1. ✔ More peptidoglycan in their cell wall

2. ✖ Lipopolysaccharide layer

3. ✖ No plasma membrane

4. ✖ Two nuclei

Question Number : 106 Question Id : 89040113516 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The most heat-resistant bacterial spores are produced by:

Options :

1. ✖ Clostridium

2. ✖ Pseudomonas

3. ✔ Bacillus

4. ✖

**Question Number : 107 Question Id : 89040113517 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

The function of a sparger in a bioreactor is to:

**Options :**

1. ✖ Remove heat
2. ✔ Provide aeration
3. ✖ Maintain pH
4. ✖ Control pressure

**Question Number : 108 Question Id : 89040113518 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

BLAST is a tool used for:

**Options :**

1. ✖ DNA sequencing
2. ✖ Protein modelling
3. ✔ Sequence alignment
4. ✖ 3D structural prediction

Question Number : 109 Question Id : 89040113519 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

Hybridoma technology is widely used to produce:

Options :

1. ✖ Hormones
2. ✖ Antibiotics
3. ✔ Monoclonal antibodies
4. ✖ Vaccines

Question Number : 110 Question Id : 89040113520 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

Which parameter is most critical for scaling up a bioreactor?

Options :

1. ✔ Oxygen transfer rate
2. ✖ Medium viscosity
3. ✖ Shape of impeller
4. ✖ Size of inlet pipes

Question Number : 111 Question Id : 89040113521 Question Type : MCQ Option Shuffling : No

**Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

The role of Taq polymerase in PCR is to:

**Options :**

1. ✖ Synthesize primers
2. ✖ Cut DNA strands
3. ✔ Amplify DNA
4. ✖ Synthesize mRNA

**Question Number : 112 Question Id : 89040113522 Question Type : MCQ Option Shuffling : No**

**Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

What is the function of a nucleolus?

**Options :**

1. ✖ DNA replication
2. ✔ Ribosome production
3. ✖ Protein modification
4. ✖ ATP synthesis

**Question Number : 113 Question Id : 89040113523 Question Type : MCQ Option Shuffling : No**

**Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

The catalytic efficiency of an enzyme is measured by:

Options :

1. ✖  $K_m/V_{max}$
2. ✔  $V_{max}/K_m$
3. ✖  $V_{max} * K_m$
4. ✖  $K_m - V_{max}$

Question Number : 114 Question Id : 89040113524 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The oxygen uptake requirements of a microbial population are characterized by:

Options :

1. ✖ Yield coefficient
2. ✖  $K_m$  value
3. ✖ Saturation concentration
4. ✔  $K_L a$  coefficient

Question Number : 115 Question Id : 89040113525 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The term 'totipotency' refers to the ability of:

Options :

1. ✓ A single cell to regenerate a whole organism
2. ✗ A plant to fix nitrogen
3. ✗ A cell to perform photosynthesis
4. ✗ A plant to tolerate high temperatures

Question Number : 116 Question Id : 89040113526 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which technique is used for inserting genes into plant cells?

Options :

1. ✗ Electroporation
2. ✗ Lipofection
3. ✓ Ti plasmid transformation
4. ✗ Microinjection

Question Number : 117 Question Id : 89040113527 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following microscopes has the highest resolution?

Options :

1. ✗ Light microscope
2. ✓

Electron microscope

3. ✖ Fluorescence microscope

4. ✖ Phase-contrast microscope

**Question Number : 118 Question Id : 89040113528 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

The main purpose of a FASTA file format is to store:

**Options :**

1. ✔ DNA and protein sequences

2. ✖ Protein structures

3. ✖ Drug interactions

4. ✖ Metabolic pathways

**Question Number : 119 Question Id : 89040113529 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

The catalytic efficiency of an enzyme is:

**Options :**

1. ✖  $K_m/V_{max}$

2. ✔  $V_{max}/K_m$

$$V_{\max} * K_m$$

3. ✖

$$K_m - V_{\max}$$

4. ✖

**Question Number : 120 Question Id : 89040113530 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

Immobilized enzymes have advantages over free enzymes because they:

**Options :**

Increase substrate specificity

1. ✖

Are more stable

2. ✔

Need cofactors

3. ✖

Are non-selective

4. ✖

**Question Number : 121 Question Id : 89040113531 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

In large-scale bioprocessing, which type of bioreactor is widely used for continuous culture?

**Options :**

Stirred tank bioreactor

1. ✔

Bubble column reactor

2. ✖

Fluidized bed reactor

3. ✖

4. ✖ Packed bed reactor

Question Number : 122 Question Id : 89040113532 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following is commonly used as a nitrogen source in microbial fermentation?

Options :

1. ✔ Ammonium sulfate

2. ✖ Sucrose

3. ✖ Lactic acid

4. ✖ Propanol

Question Number : 123 Question Id : 89040113533 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A DNA segment that reads the same forward and backward is called:

Options :

1. ✖ Complementary DNA

2. ✔ Palindromic DNA

3. ✖ Plasmid DNA

4. ✖

Copy DNA

Question Number : 124 Question Id : 89040113534 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The process of nitrogen fixation is primarily carried out by:

Options :

1. ✖ Fungi
2. ✔ Cyanobacteria
3. ✖ Algae
4. ✖ Yeast

Question Number : 125 Question Id : 89040113535 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The sex complement of a male child suffering from Down's syndrome is:

Options :

1. ✖ XO
2. ✖ XY
3. ✖ XX
4. ✔ XXY

Question Number : 126 Question Id : 89040113536 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

In bioleaching, which microorganism is used?

Options :

1. ✖ Pseudomonas aeruginosa
2. ✖ Bacillus subtilis
3. ✔ Thiobacillus ferrooxidans
4. ✖ Clostridium botulinum

Question Number : 127 Question Id : 89040113537 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

Which of the following is not a nonsense codon?

Options :

1. ✖ UAA
2. ✔ UUU
3. ✖ UAG
4. ✖ UGA

Question Number : 128 Question Id : 89040113538 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

Which enzyme is responsible for the unwinding of DNA during replication?

**Options :**

1. ✖ Polymerase
2. ✖ Topoisomerase
3. ✔ Helicase
4. ✖ Primase

**Question Number : 129 Question Id : 89040113539 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

DNA and histone proteins in the nucleus of a cell are associated by:

**Options :**

1. ✖ Covalent bonding
2. ✔ Hydrogen bonding
3. ✖ Hydrophobic bonding
4. ✖ Van der Waals interactions

**Question Number : 130 Question Id : 89040113540 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

The term "auxotroph" refers to a:

**Options :**

1. ☒ Bacterium with additional nutritional requirements
2. ☐ Self-sufficient organism
3. ☐ Microbe capable of fixing nitrogen
4. ☐ Fungi that grow on dead organic matter

**Question Number : 131 Question Id : 89040113541 Question Type : MCQ Option Shuffling : No**  
**Display Question Number : Yes**  
**Correct Marks : 1 Wrong Marks : 0**

The Crabtree effect leads to:

**Options :**

1. ☐ Increased oxygen consumption
2. ☒ Alcohol fermentation under aerobic conditions
3. ☐ Reduced ATP production
4. ☐ Excessive protein degradation

**Question Number : 132 Question Id : 89040113542 Question Type : MCQ Option Shuffling : No**  
**Display Question Number : Yes**  
**Correct Marks : 1 Wrong Marks : 0**

The resolving power of a microscope is enhanced by:

**Options :**

1. ✖ Increasing the wavelength of illumination
2. ✔ Using shorter wavelength light and increasing the numerical aperture
3. ✖ Decreasing the numerical aperture
4. ✖ Using longer wavelength light

**Question Number : 133 Question Id : 89040113543 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

Which of the following methods is used to transfer genes into plant cells?

**Options :**

1. ✖ Lipofection
2. ✖ Microinjection
3. ✔ Ti plasmid transformation
4. ✖ Conjugation

**Question Number : 134 Question Id : 89040113544 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

A medium designed to inhibit unwanted bacteria while promoting the growth of desired bacteria is known as:

**Options :**

1. ✖ Differential medium

2. ✖ Enrichment medium

3. ✔ Selective medium

4. ✖ Basal medium

**Question Number : 135 Question Id : 89040113545 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

Which of the following is a characteristic of facultative anaerobes?

**Options :**

1. ✖ They require oxygen at all times

2. ✖ They grow better without oxygen

3. ✔ They can use oxygen when present but also grow in its absence

4. ✖ They die in the presence of oxygen

**Question Number : 136 Question Id : 89040113546 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

The enzyme responsible for peptide bond formation during translation is:

**Options :**

1. ✔ Peptidyl transferase

2. ✖ Peptide polymerase

3. ✖ Peptidyl synthetase

4. ✖ Aminoacyl tRNA synthetase

Question Number : 137 Question Id : 89040113547 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The recommended aspect ratio for Air Lift Bioreactor (ALB) is

Options :

1. ✖ 10 – 15

2. ✖ 16 – 20

3. ✖ 0 – 1

4. ✔ 6 – 7

Question Number : 138 Question Id : 89040113548 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The unit of influent flow rate in wastewater treatment is:

Options :

1. ✖  $\text{m}^2/\text{d}$

2. ✔  $\text{m}^3/\text{d}$

3. ✖  $\text{m}/\text{s}$

4. ✖

**Question Number : 139 Question Id : 89040113549 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

A major advantage of immobilized enzymes is:

**Options :**

1. ✖ Their inability to be reused
2. ✖ Decreased stability
3. ✔ Greater resistance to denaturation
4. ✖ Increased reaction rates

**Question Number : 140 Question Id : 89040113550 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

Which phase of bacterial growth is associated with the production of secondary metabolites?

**Options :**

1. ✖ Lag phase
2. ✖ Log phase
3. ✔ Stationary phase
4. ✖ Death phase

**Question Number : 141 Question Id : 89040113551 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

The process by which genetic information is copied from DNA to RNA is called:

**Options :**

1. ✘ Replication
2. ✔ Transcription
3. ✘ Translation
4. ✘ Reverse transcription

**Question Number : 142 Question Id : 89040113552 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

The enzyme responsible for the synthesis of mRNA is:

**Options :**

1. ✘ DNA polymerase
2. ✔ RNA polymerase
3. ✘ Ligase
4. ✘ Primase

Question Number : 143 Question Id : 89040113553 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

Which of the following is NOT a function of ribosomes?

Options :

1. ✖ Protein synthesis
2. ✖ mRNA binding
3. ✔ DNA replication
4. ✖ Polypeptide chain elongation

Question Number : 144 Question Id : 89040113554 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

The major difference between prokaryotic and eukaryotic mRNA is:

Options :

1. ✖ Prokaryotic mRNA undergoes splicing
2. ✔ Eukaryotic mRNA has a 5' cap and poly-A tail
3. ✖ Prokaryotic mRNA contains introns
4. ✖ Eukaryotic mRNA lacks a ribosome binding site

Question Number : 145 Question Id : 89040113555 Question Type : MCQ Option Shuffling : No

**Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following statements about plasmids is TRUE?

**Options :**

1. ✖ They are always linear DNA molecules
2. ✖ They are found only in eukaryotic cells
3. ✔ They replicate independently of chromosomal DNA
4. ✖ They cannot be transferred between bacteria

**Question Number : 146 Question Id : 89040113556 Question Type : MCQ Option Shuffling : No**

**Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

The function of restriction enzymes in bacteria is to:

**Options :**

1. ✖ Synthesize DNA
2. ✔ Degrade foreign DNA
3. ✖ Synthesize RNA
4. ✖ Repair mutations

**Question Number : 147 Question Id : 89040113557 Question Type : MCQ Option Shuffling : No**

**Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

Which method is commonly used to insert foreign DNA into animal cells?

**Options :**

1. ✖ Ti plasmid transformation
2. ✔ Electroporation
3. ✖ Heat shock
4. ✖ Conjugation

**Question Number : 148 Question Id : 89040113558 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following is NOT a component of PCR?

**Options :**

1. ✖ Primers
2. ✖ DNA polymerase
3. ✔ Ribosomes
4. ✖ Nucleotides

**Question Number : 149 Question Id : 89040113559 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following is a major application of Southern blotting?

**Options :**

1. ✖ DNA sequencing
2. ✖ Protein identification
3. ✔ DNA fingerprinting
4. ✖ RNA expression analysis

**Question Number : 150 Question Id : 89040113560 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

The enzyme responsible for linking Okazaki fragments is:

**Options :**

1. ✔ DNA ligase
2. ✖ DNA polymerase
3. ✖ Helicase
4. ✖ Gyrase

**Question Number : 151 Question Id : 89040113561 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

In plant tissue culture, which of the following is used to induce root formation?

**Options :**

1. ✖

Cytokinin

2. ✖ Gibberellin

3. ✔ Auxin

4. ✖ Absciscic acid

**Question Number : 152 Question Id : 89040113562 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following techniques is used to create a genetically identical copy of an organism?

**Options :**

1. ✖ Genetic engineering

2. ✔ Cloning

3. ✖ PCR

4. ✖ Gene silencing

**Question Number : 153 Question Id : 89040113563 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

The Ames test is used to determine:

**Options :**

1. ✔ Mutagenicity of a chemical

2. ✖ Antibiotic resistance

3. ✖ Viral infection

4. ✖ Genetic linkage

**Question Number : 154 Question Id : 89040113564 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

The main advantage of monoclonal antibodies over polyclonal antibodies is:

**Options :**

1. ✖ They are more expensive to produce

2. ✖ They bind multiple epitopes

3. ✔ They are highly specific for a single epitope

4. ✖ They are less stable

**Question Number : 155 Question Id : 89040113565 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

What type of fermentation is used for the production of beer and wine?

**Options :**

1. ✖ Lactic acid fermentation

2. ✔ Alcoholic fermentation

3. ✖ Acetic acid fermentation

4. ✖ Mixed acid fermentation

**Question Number : 156 Question Id : 89040113566 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

Which enzyme is responsible for the conversion of pyruvate to ethanol in yeast?

**Options :**

1. ✖ Pyruvate kinase

2. ✔ Alcohol dehydrogenase

3. ✖ Acetyl-CoA synthetase

4. ✖ ATP synthase

**Question Number : 157 Question Id : 89040113567 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

The main function of mitochondria in eukaryotic cells is:

**Options :**

1. ✖ DNA replication

2. ✖ Protein synthesis

3. ✔ Energy production

4. ✖ Photosynthesis

Question Number : 158 Question Id : 89040113568 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following is a primary metabolite?

Options :

1. ✖ Antibiotics

2. ✖ Pigments

3. ✔ Ethanol

4. ✖ Toxins

Question Number : 159 Question Id : 89040113569 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The optimum temperature for most mesophilic bacteria is:

Options :

1. ✖ 0-10°C

2. ✖ 15-25°C

3. ✔ 25-40°C

4. ✖

50-60°C

**Question Number : 160 Question Id : 89040113570 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

Which of the following is a common cryoprotectant used in cell preservation?

**Options :**

1. ✖ Ethanol

2. ✔ Dimethyl sulfoxide (DMSO)

3. ✖ Acetone

4. ✖ Ammonia

**Question Number : 161 Question Id : 89040113571 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

Which enzyme catalyzes the formation of peptide bonds during translation?

**Options :**

1. ✔ Peptidyl transferase

2. ✖ DNA polymerase

3. ✖ Ligase

4. ✖

## Helicase

Question Number : 162 Question Id : 89040113572 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following is NOT a step in recombinant DNA technology?

Options :

1. ✖ Gene isolation

2. ✖ Vector insertion

3. ✔ Protein folding

4. ✖ Transformation

Question Number : 163 Question Id : 89040113573 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

What is the function of a selectable marker in genetic engineering?

Options :

1. ✔ To enable identification of transformed cells

2. ✖ To cut DNA fragments

3. ✖ To enhance protein expression

4. ✖

To bind RNA molecules

Question Number : 164 Question Id : 89040113574 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The primary function of the Golgi apparatus is:

Options :

1. ✘ ATP production
2. ✔ Protein modification and sorting
3. ✘ DNA replication
4. ✘ Lipid degradation

Question Number : 165 Question Id : 89040113575 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following is a characteristic of lysosomes?

Options :

1. ✘ They synthesize proteins
2. ✔ They contain hydrolytic enzymes
3. ✘ They store genetic material
4. ✘

They generate ATP

Question Number : 166 Question Id : 89040113576 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which type of bacteria can survive in extremely high temperatures?

Options :

1. ✖ Psychrophiles
2. ✖ Mesophiles
3. ✔ Thermophiles
4. ✖ Halophiles

Question Number : 167 Question Id : 89040113577 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which phase of bacterial growth is characterized by rapid cell division?

Options :

1. ✖ Lag phase
2. ✔ Log phase
3. ✖ Stationary phase
4. ✖

## Death phase

Question Number : 168 Question Id : 89040113578 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

Which nitrogenous base is NOT found in RNA?

Options :

1. ✖ Adenine
2. ✖ Uracil
3. ✔ Thymine
4. ✖ Cytosine

Question Number : 169 Question Id : 89040113579 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

The codon UGA is a:

Options :

1. ✖ Start codon
2. ✔ Stop codon
3. ✖ Codon for methionine
4. ✖ Codon for arginine

**Question Number : 170 Question Id : 89040113580 Question Type : MCQ Option Shuffling : No**  
**Display Question Number : Yes**  
**Correct Marks : 1 Wrong Marks : 0**

Which technique is commonly used to separate proteins based on their size?

**Options :**

1. ✓ Gel filtration chromatography
2. ✗ Ion exchange chromatography
3. ✗ Affinity chromatography
4. ✗ Thin-layer chromatography

**Question Number : 171 Question Id : 89040113581 Question Type : MCQ Option Shuffling : No**  
**Display Question Number : Yes**  
**Correct Marks : 1 Wrong Marks : 0**

Which of the following is NOT an example of a post-translational modification?

**Options :**

1. ✗ Phosphorylation
2. ✗ Glycosylation
3. ✗ Protein splicing
4. ✓ Transcription

**Question Number : 172 Question Id : 89040113582 Question Type : MCQ Option Shuffling : No**

**Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

A non-competitive inhibitor binds to:

**Options :**

1. ✖ The active site of an enzyme
2. ✖ The substrate directly
3. ✔ An allosteric site of the enzyme
4. ✖ The product of the reaction

**Question Number : 173 Question Id : 89040113583 Question Type : MCQ Option Shuffling : No**

**Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

The energy currency of the cell is:

**Options :**

1. ✖ DNA
2. ✖ RNA
3. ✔ ATP
4. ✖ Glucose

**Question Number : 174 Question Id : 89040113584 Question Type : MCQ Option Shuffling : No**

**Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

In anaerobic respiration, the final electron acceptor is:

Options :

1. ✖ Oxygen
2. ✔ Nitrate or sulfate
3. ✖ Water
4. ✖ NADH

Question Number : 175 Question Id : 89040113585 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

What is the main role of tRNA in translation?

Options :

1. ✖ Catalyzing peptide bond formation
2. ✔ Carrying amino acids to ribosomes
3. ✖ Synthesizing mRNA
4. ✖ Regulating DNA replication

Question Number : 176 Question Id : 89040113586 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

The function of a ribozyme is to:

Options :

1. ✓ Act as a biological catalyst
2. ✗ Replicate DNA
3. ✗ Encode proteins
4. ✗ Regulate RNA splicing

Question Number : 177 Question Id : 89040113587 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

The most commonly used model organism in molecular biology is:

Options :

1. ✗ *Arabidopsis thaliana*
2. ✓ *Escherichia coli*
3. ✗ *Saccharomyces cerevisiae*
4. ✗ *Drosophila melanogaster*

Question Number : 178 Question Id : 89040113588 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

In gene therapy, a viral vector is used to:

Options :

1. ✖ Transmit a disease
2. ✔ Deliver genetic material into cells
3. ✖ Destroy foreign cells
4. ✖ Induce mutations

**Question Number : 179 Question Id : 89040113589 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

Which of the following elements is a micronutrient essential for enzyme function?

**Options :**

1. ✖ Sodium
2. ✔ Zinc
3. ✖ Carbon
4. ✖ Oxygen

**Question Number : 180 Question Id : 89040113590 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

The process of cell differentiation is controlled by:

**Options :**

1. ✔ Gene expression

2. ✖ DNA replication

3. ✖ Osmotic pressure

4. ✖ Mitochondrial division

**Question Number : 181 Question Id : 89040113591 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

Which of the following vaccines was the first to be developed using animal cell culture?

**Options :**

1. ✖ Hepatitis B vaccine

2. ✖ Influenza vaccine

3. ✔ Polio vaccine

4. ✖ Smallpox vaccine

**Question Number : 182 Question Id : 89040113592 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

Which of the following is NOT a source of energy in active muscle cells?

**Options :**

1. ✔ Lactic acid

2. ✖ ATP

3. ✖ Creatine phosphate

4. ✖ Glucose

**Question Number : 183 Question Id : 89040113593 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

What is the main function of cytokines in cell signaling?

**Options :**

1. ✖ Inhibiting cell communication

2. ✖ Promoting bacterial infections

3. ✔ Regulating immune responses

4. ✖ Suppressing protein synthesis

**Question Number : 184 Question Id : 89040113594 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

Hybridoma cells are primarily used for the production of:

**Options :**

1. ✖ Enzymes

2. ✔ Monoclonal antibodies

3. ✖ Cytotoxic drugs

Recombinant proteins

4. ✖

Question Number : 185 Question Id : 89040113595 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Gene knockout refers to the:

Options :

Inactivation of a specific gene

1. ✔

Removal of an entire chromosome

2. ✖

Overexpression of a gene

3. ✖

Transcriptional silencing of mRNA

4. ✖

Question Number : 186 Question Id : 89040113596 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following is a non-coding RNA involved in gene regulation?

Options :

rRNA

1. ✖

tRNA

2. ✖

miRNA

3. ✔

4. ✖

mRNA

Question Number : 187 Question Id : 89040113597 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The enzyme responsible for copying RNA into DNA is called:

Options :

1. ✖ RNA polymerase
2. ✔ Reverse transcriptase
3. ✖ DNA ligase
4. ✖ Endonuclease

Question Number : 188 Question Id : 89040113598 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following is a method used to analyze protein expression?

Options :

1. ✖ Northern blot
2. ✔ Western blot
3. ✖ Southern blot
4. ✖ PCR

Question Number : 189 Question Id : 89040113599 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

Which of the following is an example of a secondary metabolite?

Options :

1. ✖ Ethanol
2. ✔ Antibiotics
3. ✖ Glucose
4. ✖ Amino acids

Question Number : 190 Question Id : 89040113600 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

The GenBank database is primarily used for storing:

Options :

1. ✖ Protein sequences
2. ✖ Metabolic pathways
3. ✔ DNA sequences
4. ✖ Chemical structures

Question Number : 191 Question Id : 89040113601 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

Which of the following best describes a facultative anaerobe?

Options :

1. ✖ Requires oxygen to survive
2. ✔ Can grow with or without oxygen
3. ✖ Dies in the presence of oxygen
4. ✖ Uses only anaerobic respiration

Question Number : 192 Question Id : 89040113602 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

The role of a chemostat in a bioreactor is to:

Options :

1. ✖ Remove toxic by-products
2. ✔ Maintain a constant culture environment
3. ✖ Prevent contamination
4. ✖ Increase mutation rates

Question Number : 193 Question Id : 89040113603 Question Type : MCQ Option Shuffling : No

**Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following is a major advantage of immobilized enzymes?

**Options :**

1. ✖ They are cheaper than free enzymes
2. ✔ They can be reused multiple times
3. ✖ They require more cofactors
4. ✖ They have reduced specificity

**Question Number : 194 Question Id : 89040113604 Question Type : MCQ Option Shuffling : No**

**Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

What is the purpose of using a fusion protein tag in recombinant protein production?

**Options :**

1. ✖ To break down the protein
2. ✖ To inhibit gene expression
3. ✔ To facilitate purification
4. ✖ To degrade unwanted proteins

**Question Number : 195 Question Id : 89040113605 Question Type : MCQ Option Shuffling : No**

**Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following is responsible for the inhibition of enzyme activity in feedback inhibition?

**Options :**

1. ✖ Enzymes
2. ✔ End product
3. ✖ Temperature
4. ✖ Substrate concentration

**Question Number : 196 Question Id : 89040113606 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

What is the function of a promoter region in a gene?

**Options :**

1. ✖ To terminate transcription
2. ✖ To enhance DNA replication
3. ✔ To initiate transcription
4. ✖ To degrade RNA

**Question Number : 197 Question Id : 89040113607 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

What is the main advantage of using bacterial expression systems for protein production?

**Options :**

1. ✖ High post-translational modification
2. ✔ Fast growth rate and high yield
3. ✖ Large genome size
4. ✖ High energy requirements

**Question Number : 198 Question Id : 89040113608 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

A mutation that does not change the amino acid sequence of a protein is called a:

**Options :**

1. ✖ Frameshift mutation
2. ✖ Nonsense mutation
3. ✔ Silent mutation
4. ✖ Missense mutation

**Question Number : 199 Question Id : 89040113609 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

The process of introducing foreign DNA into bacterial cells using heat shock or electroporation is called:

**Options :**

1. ✖ Transduction
2. ✔ Transformation
3. ✖ Conjugation
4. ✖ Transcription

**Question Number : 200 Question Id : 89040113610 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following is NOT a component of a plasmid cloning vector?

**Options :**

1. ✖ Origin of replication
2. ✖ Selectable marker
3. ✔ Ribosome binding site
4. ✖ Multiple cloning site