

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 :	Electronics and Communication Engineering 19th Sep 2021 Shift2
Duration :	180
Total Marks :	200
Display Marks:	No
Calculator :	None
Magnifying Glass Required? :	No
Ruler Required? :	No
Eraser Required? :	No
Scratch Pad Required? :	No
Rough Sketch/Notepad Required? :	No
Protractor Required? :	No
Show Watermark on Console? :	Yes
Highlighter :	No
Auto Save on Console? (SA type of questions will be always auto saved) :	Yes
Is this Group for Examiner? :	No

Section Id :	477203405
Section Number :	1
Mandatory or Optional :	Mandatory
Number of Questions :	50
Section Marks :	50
Enable Mark as Answered Mark for Review and Clear Response :	Yes

Question Number : 1 Question Id : 47720320633 Display Question Number : Yes Is Question Mandatory : No

If $k \neq -5$ is a real number, then, the number of solutions to the following system of equations

$$3x - y + 4z = 3$$

$$x + 2y - 3z = -2$$

$$6x + 5y + kz = -3 \quad \text{is}$$

Options :

1. ✘ 0

2. ✔ 1

3. ✘ 2

4. ✘ *infinitely many*

Question Number : 2 Question Id : 47720320634 Display Question Number : Yes Is Question Mandatory : No

$$\begin{vmatrix} 1 & 1+p & 1+p+q \\ 2 & 3+2p & 4+3p+2q \\ 3 & 6+3p & 10+6p+3q \end{vmatrix} =$$

Options :

1. ✘ 0

2. ✔ 1

3. ✘ 2

4. ✘ 3

Question Number : 3 Question Id : 47720320635 Display Question Number : Yes Is Question

Mandatory : No

Let $|A|$ denote the determinant of the matrix A . If A is a square matrix of order 3, and $|4A| = r|A|$, then the value of r is

Options :

1. ✘ 0

2. ✘ 4

3. ✘ 16

4. ✔ 64

Question Number : 4 Question Id : 47720320636 Display Question Number : Yes Is Question

Mandatory : No

If $\begin{vmatrix} y & y \\ 1 & y \end{vmatrix} = \begin{vmatrix} 3 & 4 \\ 1 & 2 \end{vmatrix}$, then the value of y is

Options :

1. ✘ 0

2. ✘ 1

3. ✔ 2

4. ✘ 3

Question Number : 5 Question Id : 47720320637 Display Question Number : Yes Is Question Mandatory : No

Let $\begin{vmatrix} 2 & 3+i & -1 \\ 3-i & 0 & -1+i \\ -1 & -1-i & 1 \end{vmatrix} = a + ib$, where a and b are real numbers. Then the value of b is

Options :

1. ✔ 0

2. ✘ 1

3. ✘ 3

4. ✘ 4

Question Number : 6 Question Id : 47720320638 Display Question Number : Yes Is Question Mandatory : No

If $\frac{y^2-5y+1}{(y+1)(y+2)(y+3)} = \frac{a}{y+1} + \frac{b}{(y+1)(y+2)} + \frac{c}{(y+1)(y+2)(y+3)}$, then,

Options :

1. ✘ $a = 1, b = 10, c = 25$
2. ✔ $a = 1, b = -10, c = 25$
3. ✘ $a = 5, b = 10, c = 25$
4. ✘ $a = 5, b = -10, c = 25$

Question Number : 7 Question Id : 47720320639 Display Question Number : Yes Is Question Mandatory : No

$$\frac{2x+3}{(x^2+1)(x+4)} =$$

Options :

1. ✘ $\frac{5}{17(x+4)} + \frac{5x+14}{17(x^2+1)}$
2. ✘ $\frac{-5}{17(x+4)} - \frac{5x+14}{17(x^2+1)}$
3. ✔ $\frac{-5}{17(x+4)} + \frac{5x+14}{17(x^2+1)}$

$$\frac{-5}{17(x+4)} + \frac{5x-14}{17(x^2+1)}$$

4. ✘

Question Number : 8 Question Id : 47720320640 Display Question Number : Yes Is Question Mandatory : No

If x and y are two distinct real numbers, then, the number of values of θ in $[0, 2\pi]$ for which $\operatorname{cosec} \theta = \frac{x^2 - y^2}{x^2 + y^2}$ is

Options :

1. ✔ 0

2. ✘ 1

3. ✘ 2

4. ✘ 3

Question Number : 9 Question Id : 47720320641 Display Question Number : Yes Is Question Mandatory : No

If $\cos(\alpha - \beta) + \cos(\beta - \gamma) + \cos(\gamma - \alpha) = -\frac{3}{2}$, then $\cos \alpha + \cos \beta + \cos \gamma =$

Options :

1. ✘ $-\frac{3}{2}$

2. ✘ -1

3. ✔ 0

4. ✘ 1

Question Number : 10 Question Id : 47720320642 Display Question Number : Yes Is Question Mandatory : No

For all real numbers θ , the value of $\sin^2 \theta + \cos^4 \theta$ is greater than or equal to

Options :

1. ✔ $\frac{3}{4}$

2. ✘ 1

3. ✘ $\frac{5}{4}$

4. ✘ 2

Question Number : 11 Question Id : 47720320643 Display Question Number : Yes Is Question Mandatory : No

Let x be a real number such that $\tan\left(\frac{\pi}{4} + x\right) + \tan\left(\frac{\pi}{4} - x\right) = 2$. Then x is of the form $x = n\pi + a$, where $n \in \mathbb{Z}$, and $a =$

Options :

1. ✔ 0

2. ✘ $\frac{\pi}{3}$

3. ✘ $\frac{\pi}{4}$

4. ✘ $\frac{\pi}{6}$

Question Number : 12 Question Id : 47720320644 Display Question Number : Yes Is Question Mandatory : No

If $(\sin^{-1} x) > (\cos^{-1} x)$, then x belongs to the interval

Options :

1. ✘ $[0, \frac{1}{\sqrt{2}})$

2. ✔ $(\frac{1}{\sqrt{2}}, 1]$

3. ✘ $[\frac{1}{\sqrt{2}}, 1]$

4. ✘ $[0, \frac{1}{\sqrt{2}}]$

Question Number : 13 Question Id : 47720320645 Display Question Number : Yes Is Question Mandatory : No

Consider a triangle ΔABC , with sides of length a, b and c , and angles A, B and C . If

a, b, c and the area of the triangle ΔABC are all rational, then

Options :

1. ✘ $\tan \frac{B}{2}$ is rational and $\tan \frac{C}{2}$ is irrational.

2. ✘

$\tan \frac{B}{2}$ is irrational and $\tan \frac{C}{2}$ is rational.

3. ✓ $\tan \frac{B}{2}$ and $\tan \frac{C}{2}$ are both rational.

4. ✗ $\tan \frac{B}{2}$ and $\tan \frac{C}{2}$ are both irrational.

Question Number : 14 Question Id : 47720320646 Display Question Number : Yes Is Question Mandatory : No

Consider a triangle $\triangle ABC$, with sides of length a, b and c , and angles A, B and C . If

$3a=b+c$, then the value of $\cot \frac{B}{2} \cdot \cot \frac{C}{2}$ is

Options :

1. ✗ 0

2. ✗ $\frac{1}{2}$

3. ✗ $\sqrt{3}$

4. ✓ 2

Question Number : 15 Question Id : 47720320647 Display Question Number : Yes Is Question Mandatory : No

$2 \tan^{-1} \left(\frac{3}{4} \right) - \tan^{-1} \left(\frac{17}{31} \right) =$

Options :

1. ✘ 0

2. ✔ $\frac{\pi}{4}$

3. ✘ $\frac{\pi}{2}$

4. ✘ π

Question Number : 16 Question Id : 47720320648 Display Question Number : Yes Is Question Mandatory : No

Consider a triangle $\triangle ABC$ with angles A, B and C . If $\cos A + \cos B + \cos C = \frac{3}{2}$, then the triangle $\triangle ABC$ is

Options :

1. ✔ equilateral.

2. ✘ isosceles, and right-angled.

3. ✘ isosceles, with one of the angles equal to $\frac{\pi}{6}$.

4. ✘ scalene

Question Number : 17 Question Id : 47720320649 Display Question Number : Yes Is Question Mandatory : No

The value of $\cos^2 x + \cos^2 \left(x + \frac{\pi}{3}\right) + \cos^2 \left(x - \frac{\pi}{3}\right)$ is

Options :

1. ✘ 1

2. ✔ $\frac{3}{2}$

3. ✘ 2

4. ✘ $\frac{5}{2}$

Question Number : 18 Question Id : 47720320650 Display Question Number : Yes Is Question Mandatory : No

The value of $\left(\frac{\sqrt{3}+i}{\sqrt{3}-i}\right)^3$ is

Options :

1. ✘ $-2\sqrt{2}$

2. ✔ -1

3. ✘ 0

4. ✘ $2\sqrt{2}$

Question Number : 19 Question Id : 47720320651 Display Question Number : Yes Is Question Mandatory : No

If $x + iy = \frac{a+ib}{a-ib}$, then $x^2 + y^2 =$

Options :

1. ✘ 0

2. ✔ 1

3. ✘ 2

4. ✘ 4

Question Number : 20 Question Id : 47720320652 Display Question Number : Yes Is Question Mandatory : No

If a circle of radius 5 touches the circle $x^2 + y^2 - 2x - 4y = 20$ at the point (5,5), then, its center is

Options :

1. ✘ (8,8)

2. ✘ (8,9)

3. ✔ (9,8)

4. ✘ (9,9)

Question Number : 21 Question Id : 47720320653 Display Question Number : Yes Is Question Mandatory : No

The equation $9x^2 - 24xy + 16y^2 - 20x - 15y = 60$ represents

Options :

1. ✓ a parabola

2. ✘ an ellipse

3. ✘ a hyperbola

4. ✘ a circle

Question Number : 22 Question Id : 47720320654 Display Question Number : Yes Is Question Mandatory : No

Let $(x_j, y_j), j=1,2,3,4$, be points of intersection of the parabola $y^2 = 4ax$ and the circle $x^2 + y^2 + 2gx + 2fy + c = 0$.

Then $y_1 + y_2 + y_3 + y_4 =$

Options :

1. ✘ -2

2. ✘ $-\frac{1}{2}$

3. ✓ 0

4. ✘ $\frac{1}{2}$

Question Number : 23 Question Id : 47720320655 Display Question Number : Yes Is Question Mandatory : No

The length of the major axis of the ellipse $9x^2 + 5y^2 - 30y = 0$ is

Options :

1. ✘ $\sqrt{5}$

2. ✘ 3

3. ✘ $2\sqrt{5}$

4. ✔ 6

Question Number : 24 Question Id : 47720320656 Display Question Number : Yes Is Question Mandatory : No

If $S(-1, 1)$ is one of the foci of a hyperbola, $x - y + 3 = 0$ is its directrix corresponding to S and 3 is its eccentricity, then, the equation of the hyperbola is

Options :

1. ✘ $7x^2 + 18xy + 7y^2 + 50x + 50y + 77 = 0$

2. ✘ $7x^2 + 18xy + 7y^2 + 50x - 50y + 77 = 0$

3. ✔ $7x^2 - 18xy + 7y^2 + 50x - 50y + 77 = 0$

4. ✘ $7x^2 - 18xy - 7y^2 - 50x + 50y + 77 = 0$

Question Number : 25 Question Id : 47720320657 Display Question Number : Yes Is Question Mandatory : No

The equation $4(x - 2y + 1)^2 + 9(2x + y + 2)^2 = 25$ represents

Options :

1. ✘ a parabola
2. ✔ an ellipse
3. ✘ a hyperbola
4. ✘ a circle

Question Number : 26 Question Id : 47720320658 Display Question Number : Yes Is Question

Mandatory : No

Let f be a twice differentiable function such that $f''(x) + f(x) = 0$, and $f'(x) = g(x)$. If $h(x) = [f(x)]^2 + [g(x)]^2$, and $h(10) = 20$, then $h(40) =$

Options :

1. ✔ 20
2. ✘ 40
3. ✘ 80
4. ✘ 160

Question Number : 27 Question Id : 47720320659 Display Question Number : Yes Is Question

Mandatory : No

$$\lim_{x \rightarrow \frac{\pi}{2}} \left(\frac{\cot x - \cos x}{\cos^2 x} \right) =$$

Options :

1. ✘ -1

2. ✔ 0

3. ✘ $\sqrt{3}$

4. ✘ $\frac{\pi}{2}$

Question Number : 28 Question Id : 47720320660 Display Question Number : Yes Is Question Mandatory : No

Let \mathbb{R} be the set of all real numbers. Let $f: \mathbb{R} \rightarrow \mathbb{R}$ satisfy the condition:

$|f(x) - f(y)| \leq |x - y|^{2021}$, for all $x, y \in \mathbb{R}$. Then the value of $f'(2022)$ is

Options :

1. ✔ 0

2. ✘ 1

3. ✘ 2021

4. ✘ 2022

Question Number : 29 Question Id : 47720320661 Display Question Number : Yes Is Question

Mandatory : No

The number of real roots of the equation $x + e^x = 0$ is

Options :

1. ✘ 0

2. ✔ 1

3. ✘ 2

4. ✘ Infinitely many

Question Number : 30 Question Id : 47720320662 Display Question Number : Yes Is Question

Mandatory : No

If $y = \text{Tan}^{-1} \left(\frac{\sqrt{1+\sin x} + \sqrt{1-\sin x}}{\sqrt{1+\sin x} - \sqrt{1-\sin x}} \right)$, then $\frac{dy}{dx} =$

Options :

1. ✘ $\cot^2 x$

2. ✘ $\sec^2 x$

3. ✔ $-\frac{1}{2}$

4. ✘ $\frac{1}{2}$

Question Number : 31 Question Id : 47720320663 Display Question Number : Yes Is Question Mandatory : No

The equation of the tangent to the curve $x = \sin 3t, y = \cos 2t$, at $t = \frac{\pi}{4}$ is given by

Options :

1. ✘ $\sqrt{2}x - 3y - 2 = 0$

2. ✘ $\sqrt{2}x + 3y - 2 = 0$

3. ✔ $2\sqrt{2}x - 3y - 2 = 0$

4. ✘ $2\sqrt{2}x - 3y + 2 = 0$

Question Number : 32 Question Id : 47720320664 Display Question Number : Yes Is Question Mandatory : No

An open tank with a square base (with side x) and vertical sides (with height y) is to be constructed from a metal sheet so as to hold a given quantity of water. The cost of the material will be the least if

Options :

1. ✘ $x=y$

2. ✔ $x=2y$

3. ✘ $2x=y$

4. ✘

$$4x=y$$

Question Number : 33 Question Id : 47720320665 Display Question Number : Yes Is Question Mandatory : No

The function $f(x) = x^3 - 12x^2 + 36x + 48$, is decreasing in the interval

Options :

1. ✘ $(-\infty, 2)$

2. ✘ $(-\infty, 6)$

3. ✔ $(2, 6)$

4. ✘ $(6, \infty)$

Question Number : 34 Question Id : 47720320666 Display Question Number : Yes Is Question Mandatory : No

A shopkeeper can buy x items for Rs. $\left(\frac{x}{5} + 500\right)$. He can sell the x items at the rate

Rs. $\left(5 - \frac{x}{100}\right)$ per item. Then the number of items he should sell to make maximum

profit is

Options :

1. ✔ 240

2. ✘ 360

3. ✘ 400

4. ✘ 500

Question Number : 35 Question Id : 47720320667 Display Question Number : Yes Is Question Mandatory : No

$$\text{If } z = ax^2 + 2hxy + by^2, \text{ then } x \frac{\partial z}{\partial x} + y \frac{\partial z}{\partial y} =$$

Options :

1. ✘ z

2. ✘ z^2

3. ✘ $\frac{1}{2}z$

4. ✔ $2z$

Question Number : 36 Question Id : 47720320668 Display Question Number : Yes Is Question Mandatory : No

$$\int_{-1}^1 \frac{x \sin^{-1} x}{\sqrt{1-x^2}} dx =$$

Options :

1. ✘ 0

2. ✘ 1

3. ✘ $\frac{3}{2}$

4. ✔ 2

Question Number : 37 Question Id : 47720320669 Display Question Number : Yes Is Question Mandatory : No

The area of the region bounded by the curve $y = x^2 + 4$, the x-axis and the ordinates at $x=1$ and $x=5$ is

Options :

1. ✘ $\frac{147}{3}$

2. ✔ $\frac{172}{3}$

3. ✘ $\frac{187}{3}$

4. ✘ $\frac{227}{3}$

Question Number : 38 Question Id : 47720320670 Display Question Number : Yes Is Question Mandatory : No

$$\lim_{n \rightarrow \infty} \sum_{k=0}^{n-1} \frac{1}{\sqrt{n^2 - k^2}} =$$

Options :

1. ✘ 0

2. ✔

$$\frac{\pi}{2}$$

3. ✘ π

4. ✘ 2π

Question Number : 39 Question Id : 47720320671 Display Question Number : Yes Is Question Mandatory : No

$$\int_0^1 \frac{2x}{1+x^2} dx =$$

Options :

1. ✘ 1

2. ✘ 2

3. ✔ $\log 2$

4. ✘ $3 \log 2$

Question Number : 40 Question Id : 47720320672 Display Question Number : Yes Is Question Mandatory : No

$$\int \frac{e^{ax} - e^{-ax}}{e^{ax} + e^{-ax}} dx =$$

(In the following, c is a constant.)

Options :

1. ✓ $\frac{1}{a} \log |e^{ax} + e^{-ax}| + c$

2. ✗ $\frac{1}{a} \log |e^{ax} - e^{-ax}| + c$

3. ✗ $\frac{1}{2a} \log |e^{ax} + e^{-ax}| + c$

4. ✗ $\frac{1}{2a} \log |e^{ax} - e^{-ax}| + c$

Question Number : 41 Question Id : 47720320673 Display Question Number : Yes Is Question Mandatory : No

$$\int_0^{\pi} \frac{e^{\cos x}}{e^{\cos x} + e^{-\cos x}} dx =$$

Options :

1. ✗ $-\pi$

2. ✗ 0

3. ✓ $\frac{\pi}{2}$

4. ✗ π

Question Number : 42 Question Id : 47720320674 Display Question Number : Yes Is Question Mandatory : No

$$\int_{-\pi}^{\pi} \sin^5 x \, dx =$$

Options :

1. ✓ 0

2. ✗ $\frac{\pi}{2}$

3. ✗ π

4. ✗ 2π

Question Number : 43 Question Id : 47720320675 Display Question Number : Yes Is Question Mandatory : No

The area of the region bounded by $y=|x+3|$, the x-axis and the lines $x = -6$ and $x = 0$ is

Options :

1. ✗ 3 square units

2. ✓ 9 square units

3. ✗ 12 square units

4. ✗ 18 square units

Question Number : 44 Question Id : 47720320676 Display Question Number : Yes Is Question

Mandatory : No

The degree of the differential equation $7x \left(\frac{dy}{dx}\right)^2 - \frac{d^2y}{dx^2} + 10y = \log x$ is

Options :

1. ✓ 1

2. ✗ 2

3. ✗ 3

4. ✗ 4

Question Number : 45 Question Id : 47720320677 Display Question Number : Yes Is Question

Mandatory : No

The solution of the differential equation $\frac{dy}{dx} = y \tan x$, given that $y=1$ when $x=0$, is given by

Options :

1. ✗ $y = \cos x$

2. ✗ $y = \cos 2x$

3. ✓ $y = \sec x$

4. ✗ $y = \sec 2x$

Question Number : 46 Question Id : 47720320678 Display Question Number : Yes Is Question

Mandatory : No

The solution to the differential equation $(3x^2 + y) \frac{dx}{dy} = x$, ($x > 0$), such that $y=1$ if $x=1$ is

Options :

1. ✘ $y = 2x^2 - x$

2. ✔ $y = 3x^2 - 2x$

3. ✘ $y = 4x^2 - 3x$

4. ✘ $y = 5x^2 - 4x$

Question Number : 47 Question Id : 47720320679 Display Question Number : Yes Is Question

Mandatory : No

The differential equation of the family of parabolas having vertex at the origin and axis along the positive y-axis is

Options :

1. ✘ $xy' = 2$

2. ✔ $xy' = 2y$

3. ✘ $xy' = -2y$

4. ✘ $xy' = 2y^2$

Question Number : 48 Question Id : 47720320680 Display Question Number : Yes Is Question

Mandatory : No

The solution of the differential equation $\frac{dy}{dx} + y \cot x = 4x \operatorname{cosec} x$, ($x \neq 0$), given that $y=0$ when $x = \frac{\pi}{2}$ is

Options :

$$y \operatorname{cosec} x = x^2 - \frac{\pi^2}{4}$$

1. ✘

$$y \operatorname{cosec} x = 2x^2 - \frac{\pi^2}{2}$$

2. ✘

$$y \sin x = x^2 - \frac{\pi^2}{4}$$

3. ✘

$$y \sin x = 2x^2 - \frac{\pi^2}{2}$$

4. ✔

Question Number : 49 Question Id : 47720320681 Display Question Number : Yes Is Question

Mandatory : No

The general solution of the differential equation $\log_e \left(\frac{dy}{dx} \right) = ax + by$ is given by

Options :

$$ae^{ax} + be^{-by} + C = 0$$

1. ✘

$$ae^{ax} - be^{-by} + C = 0$$

2. ✘

$$\frac{1}{a} e^{ax} + \frac{1}{b} e^{-by} + C = 0$$

3. ✔

4. ✘ $\frac{1}{a}e^{ax} - \frac{1}{b}e^{-by} + C = 0$

Question Number : 50 Question Id : 47720320682 Display Question Number : Yes Is Question Mandatory : No

The particular integral of the differential equation $(D^2 + D - 2)y = \sin x$ is given by

Options :

1. ✘ $-\frac{1}{10}(\cos x + \sin x)$

2. ✔ $-\frac{1}{10}(\cos x + 3 \sin x)$

3. ✘ $-\frac{1}{10}(\cos 3x + \sin 3x)$

4. ✘ $-\frac{1}{10}(3 \cos x + \sin x)$

Physics

Section Id :	477203406
Section Number :	2
Mandatory or Optional :	Mandatory
Number of Questions :	25
Section Marks :	25
Enable Mark as Answered Mark for Review and	Yes

Clear Response :

Question Number : 51 Question Id : 47720320683 Display Question Number : Yes Is Question Mandatory : No

The dimensional formula for gravitational constant, G is

Options :

1. ✘ $M^1L^3T^{-2}$

2. ✔ $M^{-1}L^3T^{-2}$

3. ✘ $M^0L^3T^{-2}$

4. ✘ $M^2L^3T^{-2}$

Question Number : 52 Question Id : 47720320684 Display Question Number : Yes Is Question Mandatory : No

Which of the following quantities have not been expressed in proper units?

Options :

1. ✘ electric field = Newton/Coulomb

2. ✘ surface tension = Newton/meter

3. ✔ energy = kg m/s

4. ✘ pressure = Newton/m²

Question Number : 53 Question Id : 47720320685 Display Question Number : Yes Is Question

Mandatory : No

A vector A is along positive x-axis. If B is another vector such that $A \times B$ is zero, then B could be

Options :

1. ✘ $4\hat{j}$

2. ✔ $-4\hat{i}$

3. ✘ $-(\hat{i} + \hat{j})$

4. ✘ $(\hat{j} + \hat{k})$

Question Number : 54 Question Id : 47720320686 Display Question Number : Yes Is Question

Mandatory : No

The scalar product of two vectors is $2\sqrt{3}$ and the magnitude of their vector product is 2.

The angle between them is

Options :

1. ✔ 30°

2. ✘ 45°

3. ✘ 60°

4. ✘ 90°

Question Number : 55 Question Id : 47720320687 Display Question Number : Yes Is Question

Mandatory : No

The work done by a force is defined as $W = \mathbf{F} \cdot \mathbf{S}$. In a certain situation \mathbf{F} and \mathbf{S} are not zero but the work done is zero when

Options :

1. ✘ \mathbf{F} and \mathbf{S} are in the same direction
2. ✘ \mathbf{F} and \mathbf{S} are in opposite direction
3. ✔ \mathbf{F} and \mathbf{S} are at right angles
4. ✘ \mathbf{F} and \mathbf{S} are at 45°

Question Number : 56 Question Id : 47720320688 Display Question Number : Yes Is Question

Mandatory : No

A body starts from rest and travels a distance x in first two seconds and a distance y in next two seconds. The relation between x and y is

Options :

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

Question Number : 57 Question Id : 47720320689 Display Question Number : Yes Is Question

Mandatory : No

A projectile is projected with initial velocity $(6\hat{i} + 8\hat{j})$ m/s. If $g = 10 \text{ m/s}^2$ then horizontal range is

Options :

1. ✘ 4.8 m
2. ✔ 9.6 m
3. ✘ 19.2 m
4. ✘ 14.0 m

Question Number : 58 Question Id : 47720320690 Display Question Number : Yes Is Question

Mandatory : No

The maximum range of a projectile fired with some initial velocity is found to be 1000 m/s, in the absence of wind and air resistance. The maximum height reached by this projectile is

Options :

1. ✔ 250 m
2. ✘ 500 m
3. ✘ 1000 m
4. ✘ 2000 m

Question Number : 59 Question Id : 47720320691 Display Question Number : Yes Is Question

Mandatory : No

The force of friction between two bodies is

Options :

1. ✓ parallel to the contact surface
2. ✗ perpendicular to the contact surface
3. ✗ inclined at 30^0 to the contact surface
4. ✗ inclined at 60^0 to the contact surface

Question Number : 60 Question Id : 47720320692 Display Question Number : Yes Is Question

Mandatory : No

A body is sliding down an inclined plane under its own weight at constant speed. If the inclination of the plane to the horizontal is 30^0 , the angle of friction is

Options :

1. ✓ 30^0
2. ✗ 60^0
3. ✗ 45^0
4. ✗ 90^0

Question Number : 61 Question Id : 47720320693 Display Question Number : Yes Is Question

Mandatory : No

A block of mass 5 kg is resting on a smooth surface. At what angle, a force of 20 N be acted on the body so that it will acquire a kinetic energy of 40 J after moving 4m

Options :

1. ✘ 30^0

2. ✘ 45^0

3. ✔ 60^0

4. ✘ 120^0

Question Number : 62 Question Id : 47720320694 Display Question Number : Yes Is Question

Mandatory : No

Two men with the weights in the ratio 4:3 run up a staircase in time, in the ratio 12:11. The ratio of power of the first to that of second is

Options :

1. ✘ $\frac{4}{3}$

2. ✘ $\frac{12}{11}$

3. ✘ $\frac{48}{33}$

4. ✔ $\frac{11}{9}$

Question Number : 63 Question Id : 47720320695 Display Question Number : Yes Is Question Mandatory : No

Energy harnessed from flowing water is called-----energy

Options :

1. ✘ Solar
2. ✔ Hydel
3. ✘ Tidal
4. ✘ Geothermal

Question Number : 64 Question Id : 47720320696 Display Question Number : Yes Is Question Mandatory : No

The total mechanical energy of a spring-mass system in simple harmonic motion is $E = 0.5 m\omega^2 A^2$. If the oscillating particle is replaced by another particle of double the mass while the amplitude A remains the same. The new mechanical energy is

Options :

1. ✘ $2E$
2. ✘ $0.5 E$
3. ✘ $\sqrt{2} E$
4. ✔ E

Question Number : 65 Question Id : 47720320697 Display Question Number : Yes Is Question

Mandatory : No

Sound of frequency 1000 Hz from a stationary source is reflected from an object approaching the source at 30 m/s back to a stationary observer located at the source. The speed of sound in air is 330 m/s. The frequency of the sound heard by the observer is

Options :

1. ✓ 1200 Hz
2. ✗ 1000 Hz
3. ✗ 1090 Hz
4. ✗ 1100 Hz

Question Number : 66 Question Id : 47720320698 Display Question Number : Yes Is Question

Mandatory : No

The frequency of a pendulum if it is taken from the earth's surface to deep into a mine

Options :

1. ✗ increases
2. ✓ decreases
3. ✗ first increases then decreases
4. ✗ remains unchanged

Question Number : 67 Question Id : 47720320699 Display Question Number : Yes Is Question Mandatory : No

Two waves of lengths 50 cm and 51 cm produced 12 beats per second. The velocity of sound is

Options :

1. ✘ 340 m/s
2. ✘ 2. 331 m/s
3. ✔ 306 m/s
4. ✘ 360 m/s

Question Number : 68 Question Id : 47720320700 Display Question Number : Yes Is Question Mandatory : No

According to reverberation time the final intensity is around

Options :

1. ✘ one-hundredth of the initial intensity
2. ✘ one-tenth of the initial intensity
3. ✘ one-thousandth of the initial intensity
4. ✔ one-millionth of the initial intensity

Question Number : 69 Question Id : 47720320701 Display Question Number : Yes Is Question Mandatory : No

An ideal gas has volume V at pressure P and temperature T . Mass of each molecule is m . The density of the gas is

Options :

1. ✘ mKT

2. ✘ $\frac{P}{KT}$

3. ✘ $\frac{P}{KTV}$

4. ✔ $\frac{Pm}{KT}$

Question Number : 70 Question Id : 47720320702 Display Question Number : Yes Is Question Mandatory : No

Work done by 0.1 mole of a gas at 27°C to double its volume at constant pressure is
($R=2$ cal/mol/K)

Options :

1. ✘ 54 cal

2. ✘ 600 cal

3. ✔ 60 cal

4. ✘

546 cal

Question Number : 71 Question Id : 47720320703 Display Question Number : Yes Is Question Mandatory : No

If the pressure of a gas contained in a closed vessel is increased by 0.4%, when heated by 1°C , its initial temperature is

Options :

1. ✓ 250 K

2. ✗ 150 K

3. ✗ 100 K

4. ✗ 50 K

Question Number : 72 Question Id : 47720320704 Display Question Number : Yes Is Question Mandatory : No

A monoatomic ideal gas, initially at temperature T_1 is enclosed in a cylinder fitted with a frictionless piston. The gas is allowed to expand adiabatically to a temperature T_2 by releasing the piston suddenly. If L_1 and L_2 are the lengths of the gas column, before and after expansion respectively, T_1/T_2 is given by

Options :

1. ✗ $\left(\frac{L_1}{L_2}\right)^{2/3}$

2. ✓ $\left(\frac{L_2}{L_1}\right)^{2/3}$

3. ✘ $\frac{L_1}{L_2}$

4. ✘ $\frac{L_2}{L_1}$

Question Number : 73 Question Id : 47720320705 Display Question Number : Yes Is Question Mandatory : No

A Carnot's engine operates with source at 127°C and sink at 27°C . If the source supplies 40 kJ of heat energy, the work done by the engine is

Options :

1. ✘ 30 kJ

2. ✔ 10 kJ

3. ✘ 4 kJ

4. ✘ 1 kJ

Question Number : 74 Question Id : 47720320706 Display Question Number : Yes Is Question Mandatory : No

The optical fibre consisting of a central core is clad by material of

Options :

1. ✔ slightly lower refractive index

2. ✘

slightly higher refractive index

equal refractive index

3. ✘

very high refractive index

4. ✘

Question Number : 75 Question Id : 47720320707 Display Question Number : Yes Is Question Mandatory : No

The susceptibility of the superconductor is

Options :

1. ✘ positive and small

2. ✘ negative and small

3. ✘ positive and unity

4. ✔ negative and unity

Chemistry

Section Id :	477203407
Section Number :	3
Mandatory or Optional :	Mandatory
Number of Questions :	25
Section Marks :	25

Enable Mark as Answered Mark for Review and
Clear Response :

Yes

Question Number : 76 Question Id : 47720320708 Display Question Number : Yes Is Question
Mandatory : No

The nucleus of tritium consists of -----

Options :

1. ✘ 1 proton + 1 neutron
2. ✘ 1 proton + 3 neutrons
3. ✘ 1 proton + zero neutron
4. ✔ 1 proton + 2 neutrons

Question Number : 77 Question Id : 47720320709 Display Question Number : Yes Is Question
Mandatory : No

Which of the following electronic configuration is not possible?

Options :

1. ✘ $1s^2 2s^2 2p^6$
2. ✔ $1s^2 2s^2 2p^7$
3. ✘ $1s^2 2s^2$
4. ✘ $1s^2 2s^2 2p^5$

Question Number : 78 Question Id : 47720320710 Display Question Number : Yes Is Question Mandatory : No

Radius of 3rd Bohr orbit of hydrogen atom is -----

Options :

1. ✘ 6.529A^0

2. ✔ 4.761A^0

3. ✘ 2.116A^0

4. ✘ 8.464A^0

Question Number : 79 Question Id : 47720320711 Display Question Number : Yes Is Question Mandatory : No

Covalent compounds are generally soluble in -----

Options :

1. ✔ Non-polar solvents

2. ✘ Polar solvents

3. ✘ Concentrated acids

4. ✘ All solvents

Question Number : 80 Question Id : 47720320712 Display Question Number : Yes Is Question Mandatory : No

Six electrons are mutually shared in -----

Options :

1. ✘ F_2

2. ✘ Cl_2

3. ✘ O_2

4. ✔ N_2

Question Number : 81 Question Id : 47720320713 Display Question Number : Yes Is Question Mandatory : No

To half the molarity of a solution, the following should be adopted.

Options :

1. ✘ Weight of the solute to be doubled

2. ✘ Weight of the solvent to be doubled

3. ✘ Volume of the solvent to be doubled

4. ✔ Volume of the solution to be doubled

Question Number : 82 Question Id : 47720320714 Display Question Number : Yes Is Question Mandatory : No

The molecular weight of KMnO_4 is "M". In a reaction KMnO_4 is reduced to K_2MnO_4 . The equivalent weight of KMnO_4 is

Options :

1. ✓ M
2. ✗ $M/2$
3. ✗ $M/3$
4. ✗ $M/4$

Question Number : 83 Question Id : 47720320715 Display Question Number : Yes Is Question Mandatory : No

Calculate the weight of NaOH present in 500 ml of 0.5 N Solution

Options :

1. ✗ 5 g
2. ✓ 10 g
3. ✗ 12 g
4. ✗ 15 g

Question Number : 84 Question Id : 47720320716 Display Question Number : Yes Is Question Mandatory : No

On addition of NaOH to water

Options :

1. ✘ Ionic product will increase
2. ✘ Ionic product will decrease
3. ✔ No change in ionic product of water
4. ✘ H_3O^+ concentration increases

Question Number : 85 Question Id : 47720320717 Display Question Number : Yes Is Question Mandatory : No

Which of the following is not a buffer solution?

Options :

1. ✘ $(\text{CH}_3\text{COOH}/\text{CH}_3\text{COONa})$
2. ✔ (HCl/NaCl)
3. ✘ $(\text{HCOOH}/\text{HCOONa})$
4. ✘ $(\text{NH}_4\text{OH}/\text{NH}_4\text{Cl})$

Question Number : 86 Question Id : 47720320718 Display Question Number : Yes Is Question Mandatory : No

Which of the following is a good conductor of electricity?

Options :

1. ✘ Diamond
2. ✔ Graphite
3. ✘ Solid NaCl
4. ✘ Wood

Question Number : 87 Question Id : 47720320719 Display Question Number : Yes Is Question Mandatory : No

Which of the following (1M) conducts more electricity?

Options :

1. ✘ Acetic acid
2. ✘ Boric acid
3. ✘ Phosphorous acid
4. ✔ Sulphuric acid

Question Number : 88 Question Id : 47720320720 Display Question Number : Yes Is Question Mandatory : No

In electrolysis of dilute H_2SO_4 , which of the following is liberated at anode in presence of inert electrode?

Options :

1. ✘ H_2
2. ✘ SO_2
3. ✔ O_2
4. ✘ SO_3

Question Number : 89 Question Id : 47720320721 Display Question Number : Yes Is Question Mandatory : No

The EMF of the cell $\text{Ni}/\text{Ni}^{2+} (0.01\text{M})/\text{Cl}^-(0.01\text{M})/\text{Cl}_2, \text{Pt}$ is ---V if the SRP of nickel and chlorine electrodes are -0.25V and +1.36V respectively

Options :

1. ✘ + 1.61
2. ✘ - 1.61
3. ✔ + 1.79
4. ✘ - 1.79

Question Number : 90 Question Id : 47720320722 Display Question Number : Yes Is Question Mandatory : No

Which of the following is correct relation used to measures the hardness of water?

Options :

1. ✓ $1 \text{ mg/L} = 1 \text{ ppm} = 0.07^\circ\text{Cl} = 0.1^\circ\text{Fr}$
2. ✗ $1 \text{ mg/L} = 0.1 \text{ ppm} = 0.7^\circ\text{Cl} = 0.1^\circ\text{Fr}$
3. ✗ $1 \text{ mg/L} = 1 \text{ ppm} = 0.7^\circ\text{Cl} = 0.01^\circ\text{Fr}$
4. ✗ $1 \text{ mg/L} = 1 \text{ ppm} = 0.7^\circ\text{Cl} = 1^\circ\text{Fr}$

Question Number : 91 Question Id : 47720320723 Display Question Number : Yes Is Question Mandatory : No

Which of the following is used as effective coagulant in the municipal water treatment to remove fine suspended and colloidal impurities?

Options :

1. ✗ $\text{Fe}_2\text{SO}_4(\text{NH}_4)_2\text{SO}_4 \cdot 7\text{H}_2\text{O}$
2. ✓ $\text{K}_2\text{SO}_4 \cdot \text{Al}_2(\text{SO}_4)_3 \cdot 24\text{H}_2\text{O}$
3. ✗ $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$
4. ✗ $\text{Na}_2\text{SO}_4 \cdot 6\text{H}_2\text{O}$

Question Number : 92 Question Id : 47720320724 Display Question Number : Yes Is Question Mandatory : No

The general chemical formula of zeolite is

Options :

1. ✓ $\text{Na}_2\text{O} \cdot \text{Al}_2\text{O}_3 \cdot x \text{SiO}_2 \cdot y \text{H}_2\text{O}$
2. ✗ $\text{Al}_2\text{O}_3 \cdot \text{H}_2\text{O}$
3. ✗ $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$
4. ✗ $\text{MgSO}_4 \cdot 5\text{H}_2\text{O}$

Question Number : 93 Question Id : 47720320725 Display Question Number : Yes Is Question Mandatory : No

----- is resulted when electrochemical corrosion happened in acidic environment.

Options :

1. ✗ Evolution of oxygen
2. ✗ Absorption of oxygen
3. ✓ Evolution of hydrogen
4. ✗ Absorption of hydrogen

Question Number : 94 Question Id : 47720320726 Display Question Number : Yes Is Question Mandatory : No

Impure metal corrodes faster than pure metal due to

Options :

1. ✓ Heterogeneity
2. ✗ Homogeneity
3. ✗ Non-galvanic cell
4. ✗ localize corrosion

Question Number : 95 Question Id : 47720320727 Display Question Number : Yes Is Question Mandatory : No

The number of repeating units in a polymer is called

Options :

1. ✗ Functionality
2. ✗ Tacticity
3. ✓ degree of polymerization
4. ✗ Specificity

Question Number : 96 Question Id : 47720320728 Display Question Number : Yes Is Question Mandatory : No

The process of vulcanisation makes rubber -----

Options :

1. ✘ Soft
2. ✔ Hard
3. ✘ Elastic
4. ✘ Swells oils

Question Number : 97 Question Id : 47720320729 Display Question Number : Yes Is Question Mandatory : No

Which of the following is thermosetting plastic

Options :

1. ✘ PVC
2. ✘ Polystyrene
3. ✘ Teflon
4. ✔ Bakelite

Question Number : 98 Question Id : 47720320730 Display Question Number : Yes Is Question Mandatory : No

The boiling range of petrol fraction is found to be

Options :

1. ✘ $120^{\circ}\text{C}-180^{\circ}\text{C}$

2. ✘ $250^{\circ}\text{C}-320^{\circ}\text{C}$

3. ✔ $40^{\circ}\text{C}-120^{\circ}\text{C}$

4. ✘ $180^{\circ}\text{C}-250^{\circ}\text{C}$

Question Number : 99 Question Id : 47720320731 Display Question Number : Yes Is Question Mandatory : No

Which of the following is not a common component of photochemical smog?

Options :

1. ✘ Ozone

2. ✘ Acrolein

3. ✘ Peroxyacetyl nitrate

4. ✔ Chlorofluorocarbons

Question Number : 100 Question Id : 47720320732 Display Question Number : Yes Is Question Mandatory : No

White lung cancer is caused by

Options :

1. ✘ Asbestos

2. ✔ Textiles

3. ✖ Paper

4. ✖ Silica

Electronics and Communication Engineering

Section Id :	477203408
Section Number :	4
Mandatory or Optional :	Mandatory
Number of Questions :	100
Section Marks :	100
Enable Mark as Answered Mark for Review and Clear Response :	Yes

Question Number : 101 Question Id : 47720320733 Display Question Number : Yes Is Question Mandatory : No

The clipping level in op-amp is determined by

Options :

1. ✖ AC supply voltage

2. ✖ Control voltage

3. ✔ Reference voltage

4. ✖ Input voltage

Question Number : 102 Question Id : 47720320734 Display Question Number : Yes Is Question

Mandatory : No

Why a voltage follower stage is connected at the output of the negative small signal half wave rectifier?

Options :

1. ✘ Due to Non-uniform input resistance
2. ✔ Due to Non-uniform output resistance
3. ✘ Due to Uniform output voltage
4. ✘ Due to Non-uniform output voltage

Question Number : 103 Question Id : 47720320735 Display Question Number : Yes Is Question

Mandatory : No

In a rectifier, larger the value of the shunt capacitor filter

Options :

1. ✘ Larger the peak-to-peak value of ripple voltage
2. ✔ Larger the peak current in the rectifying diode
3. ✘ Longer the time that current pulse flows through the diode
4. ✘ Smaller the dc voltage across the load

Question Number : 104 Question Id : 47720320736 Display Question Number : Yes Is Question

Mandatory : No

In which configuration a dead band condition occurs in Schmitt trigger ?

Options :

1. ✘ Differential amplifier with positive feedback
2. ✘ Voltage follower with positive feedback
3. ✔ Comparator with positive feedback
4. ✘ Operational amplifier with positive feedback

Question Number : 105 Question Id : 47720320737 Display Question Number : Yes Is Question

Mandatory : No

The series capacitance in the equivalent circuit of crystal oscillator represents

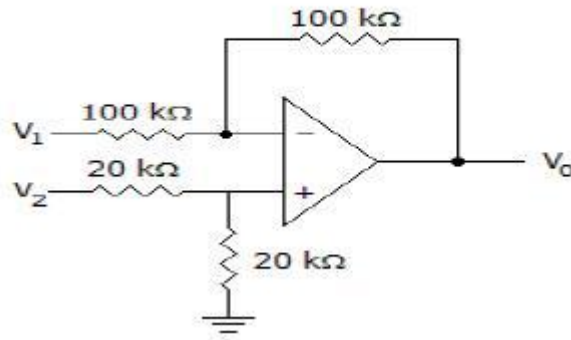
Options :

1. ✘ Inter electrode capacitance
2. ✔ Compliance
3. ✘ Viscous factor
4. ✘ Mass

Question Number : 106 Question Id : 47720320738 Display Question Number : Yes Is Question

Mandatory : No

Determine the output voltage when $V_1 = -V_2 = 1\text{ V}$



Options :

1. ✘ 0 V
2. ✔ -2 V
3. ✘ 1 V
4. ✘ 2 V

Question Number : 107 Question Id : 47720320739 Display Question Number : Yes Is Question

Mandatory : No

The AC current gain in a common base configuration is _____

Options :

1. ✔ $\Delta I_C / \Delta I_E$
2. ✘ $\Delta I_C / \Delta I_B$
3. ✘ $\Delta I_E / \Delta I_C$
4. ✘ $\Delta I_B / \Delta I_C$

Question Number : 108 Question Id : 47720320740 Display Question Number : Yes Is Question Mandatory : No

Transistor in power amplifier is

Options :

1. ✓ An active device
2. ✗ A passive device
3. ✗ A op-amp
4. ✗ A voltage generating device.

Question Number : 109 Question Id : 47720320741 Display Question Number : Yes Is Question Mandatory : No

If output is measured between two collectors of transistors, then the Differential amplifier with two input signal is said to be configured as

Options :

1. ✓ Dual Input Balanced Output
2. ✗ Dual Input Unbalanced Output
3. ✗ Single Input Balanced Output
4. ✗ Single Input Unbalanced Output

Question Number : 110 Question Id : 47720320742 Display Question Number : Yes Is Question

Mandatory : No

The UJT may be used as

Options :

1. ✘ An amplifier
2. ✔ A saw tooth generator
3. ✘ A rectifier
4. ✘ filter

Question Number : 111 Question Id : 47720320743 Display Question Number : Yes Is Question

Mandatory : No

What is line regulation?

Options :

1. ✘ The process of keeping Zener diode voltage constant in spite of changes in AC supply
2. ✔ The process of keeping load voltage constant irrespective of the fluctuation in AC supply or the line voltage
3. ✘ The process of keeping load voltage constant irrespective of fluctuation in load current
4. ✘ The process of keeping Zener current constant irrespective of fluctuation in AC supply

Question Number : 112 Question Id : 47720320744 Display Question Number : Yes Is Question

Mandatory : No

How to overcome mistriggering on the positive pulse edges in the monostable circuit?

Options :

1. ✘ Connect a RC network at the input
2. ✘ Connect an integrator at the input
3. ✔ Connect a differentiator at the input
4. ✘ Connect a diode at the input

Question Number : 113 Question Id : 47720320745 Display Question Number : Yes Is Question

Mandatory : No

What is the purpose of RC or transformer coupling?

Options :

1. ✘ To block a.c.
2. ✔ To separate bias of one stage from another
3. ✘ Increase thermal stability
4. ✘ Increase Efficiency

Question Number : 114 Question Id : 47720320746 Display Question Number : Yes Is Question

Mandatory : No

The width of depletion region of a varactor diode _____ with increase in reverse bias voltage.

Options :

1. ✓ Increases
2. ✗ Decreases
3. ✗ Remains constant
4. ✗ Increases and then decrease after a certain threshold

Question Number : 115 Question Id : 47720320747 Display Question Number : Yes Is Question

Mandatory : No

In case of an L filter connected with a rectifier in series with the load, it offers _____ impedance to ac whereas _____ resistance to dc respectively.

Options :

1. ✗ high, high
2. ✓ high, low
3. ✗ low, high
4. ✗ low, low

Question Number : 116 Question Id : 47720320748 Display Question Number : Yes Is Question

Mandatory : No

Bluetooth uses _____

Options :

1. ✓ frequency hopping spread spectrum
2. ✗ orthogonal frequency division multiplexing
3. ✗ time division multiplexing
4. ✗ channel division multiplexing

Question Number : 117 Question Id : 47720320749 Display Question Number : Yes Is Question

Mandatory : No

What is the access point (AP) in a wireless LAN?

Options :

1. ✓ device that allows wireless devices to connect to a wired network
2. ✗ wireless devices itself
3. ✗ both device that allows wireless devices to connect to a wired network and wireless devices itself
4. ✗ all the nodes in the network

Question Number : 118 Question Id : 47720320750 Display Question Number : Yes Is Question

Mandatory : No

The data transfer mode of FTP, in which all the fragmenting has to be done by TCP is _____

Options :

1. ✓ Stream mode
2. ✗ Block mode
3. ✗ Compressed mode
4. ✗ Message mode

Question Number : 119 Question Id : 47720320751 Display Question Number : Yes Is Question Mandatory : No

Which type of topology is best suited for large businesses which must carefully control and coordinate the operation of distributed branch outlets?

Options :

1. ✗ Ring
2. ✗ Local area
3. ✗ Hierarchical
4. ✓ Star

Question Number : 120 Question Id : 47720320752 Display Question Number : Yes Is Question Mandatory : No

CDMA uses

Options :

1. ✘ Hard hand off
2. ✔ Soft hand off
3. ✘ Hard & Soft hand off
4. ✘ No hand off is used

Question Number : 121 Question Id : 47720320753 Display Question Number : Yes Is Question Mandatory : No

Which parameter is called as Shannon limit?

Options :

1. ✘ P_b/N_0
2. ✔ E_b/N_0
3. ✘ E_bN_0
4. ✘ P_bN_0

Question Number : 122 Question Id : 47720320754 Display Question Number : Yes Is Question Mandatory : No

Which layer is used to link the network support layers and user support layers?

Options :

1. ✘ session layer
2. ✘ data link layer
3. ✔ transport layer
4. ✘ network layer

Question Number : 123 Question Id : 47720320755 Display Question Number : Yes Is Question Mandatory : No

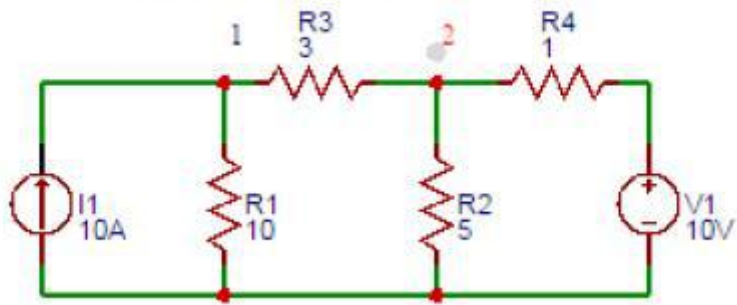
If there are 5 branches and 4 nodes in graph, then the number of mesh equations that can be formed is

Options :

1. ✔ 2
2. ✘ 4
3. ✘ 6
4. ✘ 8

Question Number : 124 Question Id : 47720320756 Display Question Number : Yes Is Question Mandatory : No

Find the voltage at node 1 of the circuit shown below



Options :

1. ✘ 32.7
2. ✔ 33.7
3. ✘ 34.7
4. ✘ 35.7

Question Number : 125 Question Id : 47720320757 Display Question Number : Yes Is Question Mandatory : No

At resonance condition, the voltage across the capacitor and inductor is _____ the source voltage.

Options :

1. ✔ Greater than
2. ✘ Less than
3. ✘ Equal to
4. ✘ Much less than

Question Number : 126 Question Id : 47720320758 Display Question Number : Yes Is Question Mandatory : No

The propagation constant of a transmission line with impedance and admittance of 9 and 16 respectively is

Options :

1. ✘ 25

2. ✘ 144

3. ✔ 12

4. ✘ 7

Question Number : 127 Question Id : 47720320759 Display Question Number : Yes Is Question Mandatory : No

The expression of resonant frequency for parallel resonant circuit is

Options :

1. ✔ $1/2\pi\sqrt{LC}$

2. ✘ $1/\pi\sqrt{LC}$

3. ✘ $1/2\sqrt{LC}$

4. ✘ $1/\sqrt{LC}$

Question Number : 128 Question Id : 47720320760 Display Question Number : Yes Is Question

Mandatory : No

If the source impedance is complex, then the condition for maximum power transfer is?

Options :

1. ✘ $Z_L = Z_S$

2. ✔ $Z_L = Z_S^*$

3. ✘ $Z_L = -Z_S$

4. ✘ $Z_L = -Z_S^*$

Question Number : 129 Question Id : 47720320761 Display Question Number : Yes Is Question

Mandatory : No

Which of the following is not true regarding standing wave?

Options :

1. ✘ In a standing wave the energy moves towards the power source

2. ✘ In a standing wave power loss occurs

3. ✔ Standing waves do not affect signal strength

4. ✘ Standing waves are not desirable



Question Number : 130 Question Id : 47720320762 Display Question Number : Yes Is Question

Mandatory : No

The reflection coefficient of a wave with transmission coefficient 0.35 is

Options :

1. ✘ 1.65

2. ✔ 0.65

3. ✘ 0.35

4. ✘ 0.7

Question Number : 131 Question Id : 47720320763 Display Question Number : Yes Is Question

Mandatory : No

For 100% modulation, power in each sideband is _____ of that of carrier.

Options :

1. ✘ 50%

2. ✘ 70%

3. ✘ 60%

4. ✔ 25%

Question Number : 132 Question Id : 47720320764 Display Question Number : Yes Is Question

Mandatory : No

Noise performance of a square law demodulator of AM signal is?

Options :

1. ✓ Better than that of synchronous detector
2. ✘ Weaker than that of synchronous detector
3. ✘ Better than that of envelope detector
4. ✘ Weaker than that of envelope detector

Question Number : 133 Question Id : 47720320765 Display Question Number : Yes Is Question Mandatory : No

What is the main function of a balanced modulator?

Options :

1. ✘ to limit the noise picked by a receiver
2. ✘ to produce balanced modulation of a carrier wave
3. ✘ to suppress carrier signal
4. ✓ to produce 100% modulation

Question Number : 134 Question Id : 47720320766 Display Question Number : Yes Is Question Mandatory : No

Mixing is used in communication to _____

Options :

1. ✘

raise the carrier frequency

2. ✘ lower the carrier frequency

3. ✘ to alter the deviation

4. ✔ to change the carrier frequency to any required value

Question Number : 135 Question Id : 47720320767 Display Question Number : Yes Is Question Mandatory : No

Pre-emphasis circuit is used _____

Options :

1. ✘ before detection

2. ✘ after detection

3. ✔ before encoding

4. ✘ after encoding

Question Number : 136 Question Id : 47720320768 Display Question Number : Yes Is Question Mandatory : No

Envelope Detector is a/an _____

Options :

1. ✘ Coherent detector

2. ✓ Asynchronous Detector

3. ✗ Synchronous Detector

4. ✗ Product Demodulator

Question Number : 137 Question Id : 47720320769 Display Question Number : Yes Is Question Mandatory : No

Which FSK has no phase discontinuity?

Options :

1. ✓ Continuous FSK

2. ✗ Discrete FSK

3. ✗ Uniform FSK

4. ✗ Non-Uniform FSK

Question Number : 138 Question Id : 47720320770 Display Question Number : Yes Is Question Mandatory : No

QAM uses _____ as the dimensions.

Options :

1. ✗ In phase only

2. ✘ Quadrature only
3. ✔ In phase & Quadrature
4. ✘ Out of Phase

Question Number : 139 Question Id : 47720320771 Display Question Number : Yes Is Question Mandatory : No

Which has same probability of error?

Options :

1. ✘ BPSK and QPSK
2. ✘ BPSK and ASK
3. ✔ BPSK and PAM
4. ✘ BPSK and QAM

Question Number : 140 Question Id : 47720320772 Display Question Number : Yes Is Question Mandatory : No

Which has continuous transmission?

Options :

1. ✘ Asynchronous
2. ✔ Synchronous

3. ✘ Asynchronous & Synchronous

4. ✘ Neither Asynchronous nor Synchronous

Question Number : 141 Question Id : 47720320773 Display Question Number : Yes Is Question Mandatory : No

How error detection and correction is done?

Options :

1. ✘ By passing it through equalizer

2. ✘ By passing it through filter

3. ✘ By amplifying it

4. ✔ By adding redundancy bits

Question Number : 142 Question Id : 47720320774 Display Question Number : Yes Is Question Mandatory : No

CRC uses

Options :

1. ✘ Multiplication

2. ✘ Subtraction

3. ✓ Binary division

4. ✘ Addition

Question Number : 143 Question Id : 47720320775 Display Question Number : Yes Is Question Mandatory : No

To achieve high signal to noise ratio, delta modulation must use

Options :

1. ✘ Under sampling

2. ✓ Over sampling

3. ✘ Aliasing

4. ✘ Normal Sampling

Question Number : 144 Question Id : 47720320776 Display Question Number : Yes Is Question Mandatory : No

Which of the following is false with respect to pulse modulation?

Options :

1. ✘ Less power consumption

2. ✘ Low noise

3. ✘ Degraded signal can be regenerated

4. ✓ Can transmit analog as well as digital waves

Question Number : 145 Question Id : 47720320777 Display Question Number : Yes Is Question Mandatory : No

Frequency division duplexing provides _____ distinct bands of frequencies for _____ user.

Options :

1. ✗ Two, two
2. ✗ One, two
3. ✓ Two, one
4. ✗ Two, many

Question Number : 146 Question Id : 47720320778 Display Question Number : Yes Is Question Mandatory : No

The ratio of maximum power density in the desired direction to the average power radiated from the antenna is called as _____

Options :

1. ✓ directivity
2. ✗ directive gain

3. ✘ power gain

4. ✘ partial directivity

Question Number : 147 Question Id : 47720320779 Display Question Number : Yes Is Question Mandatory : No

Which of the following polarization is used in monopole antenna?

Options :

1. ✘ Right-hand Circular

2. ✔ Linear

3. ✘ Depends on the feed

4. ✘ Left-hand Circular

Question Number : 148 Question Id : 47720320780 Display Question Number : Yes Is Question Mandatory : No

What is the reason for carrying multiple transponders in a satellite?

Options :

1. ✔ More number of operating channel

2. ✘ Better reception

3. ✘ More gain

4. ✘ Redundancy

Question Number : 149 Question Id : 47720320781 Display Question Number : Yes Is Question Mandatory : No

What type of handovers is supported by LTE?

Options :

1. ✔ Hard handover only
2. ✘ Soft handover only
3. ✘ Hard and soft handover
4. ✘ Hard, soft and softest handover

Question Number : 150 Question Id : 47720320782 Display Question Number : Yes Is Question Mandatory : No

The klystron tube used in a klystron amplifier is a _____ type beam amplifier.

Options :

1. ✔ Linear beam
2. ✘ Crossed field
3. ✘ Parallel field

4. ✘ Parallel and Crossed field

Question Number : 151 Question Id : 47720320783 Display Question Number : Yes Is Question Mandatory : No

_____ is a microwave device in which the frequency of operation is determined by the biasing field strength.

Options :

1. ✘ VTM

2. ✔ Gyatron

3. ✘ Helix BWO

4. ✘ klystron

Question Number : 152 Question Id : 47720320784 Display Question Number : Yes Is Question Mandatory : No

The radar in which both transmission and reception is done using the same antenna are called:

Options :

1. ✔ Monostatic radar

2. ✘ Bistatic radar

3. ✘ Monopole radar

4. ✘ Dipole radar

Question Number : 153 Question Id : 47720320785 Display Question Number : Yes Is Question Mandatory : No

What is the main requirement with the fibers that are intended for splicing?

Options :

1. ✘ Smooth and oval end faces

2. ✔ Smooth and square end faces

3. ✘ Rough edge faces

4. ✘ Large core diameter

Question Number : 154 Question Id : 47720320786 Display Question Number : Yes Is Question Mandatory : No

Which is a device that distributes light from a main fiber into one or more branch fibers ?

Options :

1. ✔ Optical fiber coupler

2. ✘ Optical fiber splice

3. ✘ Optical fiber connector

4. ✘ Optical isolator

Question Number : 155 Question Id : 47720320787 Display Question Number : Yes Is Question Mandatory : No

What is the approximate distance between directors for a Yagi-Uda antenna operating at frequency 150MHz?

Options :

1. ✔ 0.4m

2. ✘ 1.6m

3. ✘ 2m

4. ✘ 4.8m

Question Number : 156 Question Id : 47720320788 Display Question Number : Yes Is Question Mandatory : No

The logic circuits whose outputs at any instant of time depends only on the present input but also on the past outputs are called _____

Options :

1. ✘ Combinational circuits

2. ✘ Latches

3. ✔ Sequential circuits

4. ✘ Flip-flops

Question Number : 157 Question Id : 47720320789 Display Question Number : Yes Is Question Mandatory : No

What is the maximum possible range of bit-count specifically in n-bit binary counter consisting of 'n' number of flip-flops?

Options :

1. ✘ 0 to 2^n

2. ✘ 0 to 2^{n+1}

3. ✔ 0 to 2^{n-1}

4. ✘ 0 to $2^{n+1/2}$

Question Number : 158 Question Id : 47720320790 Display Question Number : Yes Is Question Mandatory : No

Ripple counters are also known as _____

Options :

1. ✘ SSI counters

2. ✘ VLSI counters

3. ✘ Synchronous counters

4. ✓ Asynchronous counters

Question Number : 159 Question Id : 47720320791 Display Question Number : Yes Is Question Mandatory : No

What is the difference between static RAM and dynamic RAM?

Options :

1. ✗ Static RAM must be refreshed, dynamic RAM does not
2. ✓ Dynamic RAM must be refreshed, static RAM does not
3. ✗ There is no difference
4. ✗ Static RAM is slower than Dynamic RAM

Question Number : 160 Question Id : 47720320792 Display Question Number : Yes Is Question Mandatory : No

How many NOT gates are required for the construction of a 4-to-1 multiplexer?

Options :

1. ✗ 3
2. ✗ 4
3. ✓ 2

4. ✘ 5

Question Number : 161 Question Id : 47720320793 Display Question Number : Yes Is Question Mandatory : No

The output of a full subtractor is same as _____

Options :

1. ✘ Half adder

2. ✔ Full adder

3. ✘ Half subtractor

4. ✘ Decoder

Question Number : 162 Question Id : 47720320794 Display Question Number : Yes Is Question Mandatory : No

The representation of decimal number $(396)_{10}$ in octal is _____

Options :

1. ✘ 18C

2. ✘ 156

3. ✘ 878

4. ✔ 614

Question Number : 163 Question Id : 47720320795 Display Question Number : Yes Is Question Mandatory : No

If you add $(23)_8$ and $(67)_8$, the result is

Options :

1. ✘ $(97)_8$

2. ✘ $(77)_8$

3. ✔ $(112)_8$

4. ✘ $(102)_8$

Question Number : 164 Question Id : 47720320796 Display Question Number : Yes Is Question Mandatory : No

The main disadvantage of a Dual Slope A/D converter is its

Options :

1. ✔ Slow Conversion Time

2. ✘ Low Sensitivity

3. ✘ High Cost

4. ✘ Temperature immunity

Question Number : 165 Question Id : 47720320797 Display Question Number : Yes Is Question Mandatory : No

Add the two BCD numbers: $1001 + 0100 = ?$

Options :

1. ✘ 10101111

2. ✘ 01010001

3. ✔ 00010011

4. ✘ 00101011

Question Number : 166 Question Id : 47720320798 Display Question Number : Yes Is Question Mandatory : No

What is the mode of the instruction `MOV AX, [BX+SI+06]`?

Options :

1. ✘ Index addressing

2. ✘ Base addressing

3. ✘ Base indexed addressing

4. ✔ Base index displacement addressing

Question Number : 167 Question Id : 47720320799 Display Question Number : Yes Is Question

Mandatory : No

What will be the contents of register AL after the following has been executed

```
MOV BL, 8C
MOV AL, 7E
ADD AL, BL
```

Options :

1. ✓ 0A and carry flag is set
2. ✗ 0A and carry flag is reset
3. ✗ 6A and carry flag is set
4. ✗ 6A and carry flag is reset

Question Number : 168 Question Id : 47720320800 Display Question Number : Yes Is Question

Mandatory : No

The BIU pre-fetches the instruction from memory and store them in ___

Options :

1. ✓ Queue
2. ✗ Register
3. ✗ Memory
4. ✗ Stack

Question Number : 169 Question Id : 47720320801 Display Question Number : Yes Is Question Mandatory : No

If MN/MX is low the 8086 operates in _____ mode.

Options :

1. ✘ Minimum
2. ✔ Maximum
3. ✘ Null
4. ✘ Medium

Question Number : 170 Question Id : 47720320802 Display Question Number : Yes Is Question Mandatory : No

The registers that cannot be used as operands for arithmetic and logical instructions are

Options :

1. ✘ General purpose registers
2. ✘ Pointers
3. ✘ Index registers
4. ✔ Segment registers

Question Number : 171 Question Id : 47720320803 Display Question Number : Yes Is Question

Mandatory : No

PUSH and POP operations are performed by

Options :

1. ✓ Stack Pointer register
2. ✗ Program counter register
3. ✗ General purpose register
4. ✗ Link register

Question Number : 172 Question Id : 47720320804 Display Question Number : Yes Is Question

Mandatory : No

The Programmable interrupt controller is required to

Options :

1. ✗ Handle one interrupt request
2. ✓ Handle one or more interrupt requests at a time
3. ✗ Handle one or more interrupt requests with a delay
4. ✗ Handle no interrupt request

Question Number : 173 Question Id : 47720320805 Display Question Number : Yes Is Question

Mandatory : No

The books arranged one on the other on a table is an example of

Options :

1. ✘ Queue
2. ✘ Queue and first-in-first out
3. ✘ Stack and first-in-first out
4. ✔ Stack and last-in-first-out

Question Number : 174 Question Id : 47720320806 Display Question Number : Yes Is Question Mandatory : No

The operands, source and destination in an instruction cannot be

Options :

1. ✘ Register, Register
2. ✔ Memory location, Memory location
3. ✘ Memory location, Register
4. ✘ Immediate data, Register

Question Number : 175 Question Id : 47720320807 Display Question Number : Yes Is Question Mandatory : No

Which of the following is not a machine-controlled instruction?

Options :

1. ✘ HLT

2. ✔ CLC

3. ✘ LOCK

4. ✘ ESC

Question Number : 176 Question Id : 47720320808 Display Question Number : Yes Is Question Mandatory : No

In TV transmission, _____ and _____ modulation techniques are used for transmission of Picture and Sound signals respectively.

Options :

1. ✘ Phase, Pulse

2. ✘ Frequency, Amplitude

3. ✔ Amplitude, Frequency

4. ✘ Amplitude, Phase

Question Number : 177 Question Id : 47720320809 Display Question Number : Yes Is Question Mandatory : No

The video voltage applied to the picture tube of a television receiver is fed in

Options :

1. ✘ between grid and ground
2. ✘ to the yoke
3. ✘ to the anode
4. ✔ between grid and cathode

Question Number : 178 Question Id : 47720320810 Display Question Number : Yes Is Question Mandatory : No

The signals sent by the TV transmitter to ensure correct scanning in the receiver are called

Options :

1. ✔ Sync
2. ✘ Chroma
3. ✘ Luminance
4. ✘ Video

Question Number : 179 Question Id : 47720320811 Display Question Number : Yes Is Question Mandatory : No

The shadow mask in a color picture tube is used to

Options :

1. ✘ reduce x-ray emission
2. ✔ ensure that each beam hits only its own dots
3. ✘ increase screen brightness
4. ✘ provide degaussing for the screen

Question Number : 180 Question Id : 47720320812 Display Question Number : Yes Is Question Mandatory : No

The working principle of Image Orthicon is

Options :

1. ✘ Photo conduction
2. ✘ Photo emulsion
3. ✔ Photo emission
4. ✘ Photo absorption

Question Number : 181 Question Id : 47720320813 Display Question Number : Yes Is Question Mandatory : No

The instrument required to measure voltage is _____

Options :

1. ✘ Ohmmeter

2. ✘ Ammeter
3. ✔ Voltmeter
4. ✘ Wattmeter

Question Number : 182 Question Id : 47720320814 Display Question Number : Yes Is Question Mandatory : No

_____ voltmeter is used to indicate the difference between known and unknown voltages.

Options :

1. ✔ Differential
2. ✘ Solid State
3. ✘ Chopper
4. ✘ FET

Question Number : 183 Question Id : 47720320815 Display Question Number : Yes Is Question Mandatory : No

The internal resistance of an ohmmeter can be estimated from _____

Options :

1. ✘ Zero deflection

2. ✘ Full scale deflection
3. ✔ Half scale deflection
4. ✘ Quarter deflection

Question Number : 184 Question Id : 47720320816 Display Question Number : Yes Is Question Mandatory : No

Dual slope integration type instruments operates on the principle of _____

Options :

1. ✘ Voltage to frequency conversion
2. ✔ Voltage to time conversion
3. ✘ Frequency to voltage conversion
4. ✘ Voltage to current conversion

Question Number : 185 Question Id : 47720320817 Display Question Number : Yes Is Question Mandatory : No

What is the use of Schmitt trigger in digital frequency meter?

Options :

1. ✘ To amplify the signal

2. ✘ To start and stop the signal
3. ✘ To convert the applied signal into sine wave
4. ✔ To convert the applied signal into train of pulses

Question Number : 186 Question Id : 47720320818 Display Question Number : Yes Is Question Mandatory : No

Trigger pulses in the CRO are used to _____

Options :

1. ✘ Generate high voltage required for the CRT
2. ✔ Synchronise the input with the time base generator
3. ✘ Synchronise the input and the vertical amplifier
4. ✘ Generate low voltages required for the CRT

Question Number : 187 Question Id : 47720320819 Display Question Number : Yes Is Question Mandatory : No

The Sine wave output of a function generator is fed to both the horizontal (X) and vertical (Y) inputs of a CRO. What will be the pattern on the cathode ray screen?

Options :

1. ✔ A straight line with 45° slope

2. ✘ A circle

3. ✘ An ellipse

4. ✘ A sinusoidal signal

Question Number : 188 Question Id : 47720320820 Display Question Number : Yes Is Question Mandatory : No

An LCR meter is used to measure _____

Options :

1. ✘ Current

2. ✘ Power

3. ✔ Inductance

4. ✘ Voltage

Question Number : 189 Question Id : 47720320821 Display Question Number : Yes Is Question Mandatory : No

The Q-meter works on the principle of _____

Options :

1. ✘ Parallel resonance

2. ✘ Self inductance

3. ✘ Mutual inductance

4. ✔ Series resonance

Question Number : 190 Question Id : 47720320822 Display Question Number : Yes Is Question Mandatory : No

In a distortion factor meter, the filter at the front end is used to suppress _____

Options :

1. ✔ Fundamental component

2. ✘ DC component

3. ✘ Odd harmonics

4. ✘ Even harmonics

Question Number : 191 Question Id : 47720320823 Display Question Number : Yes Is Question Mandatory : No

The main advantage of IGBT over SCR in power electronics is _____

Options :

1. ✘ Reduced weight

2. ✘ Self-communicating capability

3. ✔ Very high reliability

4. ✘ Self-cooling property

Question Number : 192 Question Id : 47720320824 Display Question Number : Yes Is Question Mandatory : No

A thyristor equivalent of a thyatron tube is _____

Options :

1. ✔ SCR

2. ✘ UJT

3. ✘ DIAC

4. ✘ TRIAC

Question Number : 193 Question Id : 47720320825 Display Question Number : Yes Is Question Mandatory : No

An advantage of a cycloconverter is _____

Options :

1. ✘ Very good power factor

2. ✘ Requires few number of thyristors

3. ✘ Communication failure does not short circuit the source

4. ✓ Load communication is possible

Question Number : 194 Question Id : 47720320826 Display Question Number : Yes Is Question Mandatory : No

The most suitable device for high frequency inversion in SMPS is _____

Options :

1. ✗ BJT

2. ✗ IGBT

3. ✓ MOSFET

4. ✗ GTO

Question Number : 195 Question Id : 47720320827 Display Question Number : Yes Is Question Mandatory : No

In a UPS, the solid state switch normally transfer supply within _____

Options :

1. ✓ 4 ms

2. ✗ 30 ms

3. ✗ 48 ms

4. ✗ 30 s

Question Number : 196 Question Id : 47720320828 Display Question Number : Yes Is Question Mandatory : No

The PV cell converts the radiant energy of the sun into _____

Options :

1. ✘ Temperature
2. ✘ Current
3. ✘ Humidity
4. ✔ Electric Power

Question Number : 197 Question Id : 47720320829 Display Question Number : Yes Is Question Mandatory : No

A thermocouple is _____

Options :

1. ✘ Two similar metals connected together
2. ✔ Two dissimilar metals connected together
3. ✘ Two wire wound resistors connected together
4. ✘ Two inductive coils connected together

Question Number : 198 Question Id : 47720320830 Display Question Number : Yes Is Question Mandatory : No

LVDT is a _____

Options :

1. ✘ Capacitive transducer
2. ✔ Inductive transducer
3. ✘ Resistive transducer
4. ✘ Inverse transducer

Question Number : 199 Question Id : 47720320831 Display Question Number : Yes Is Question Mandatory : No

A strain gauge is a passive transducer and is employed for converting_____

Options :

1. ✔ Mechanical displacement into a change of resistance
2. ✘ Pressure into a change of resistance
3. ✘ Force into displacement
4. ✘ Pressure into displacement

Question Number : 200 Question Id : 47720320832 Display Question Number : Yes Is Question

Mandatory : No

Thermistors have _____ temperature coefficient

Options :

1. ✘ Zero
2. ✘ Positive
3. ✘ Positive for low operating ranges
4. ✔ Negative