

Question Paper Preview

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 12th May 2025 Shift1
Subject Name :	Electronics and Communication Engineering
Creation Date :	2025-05-12 13:25:57
Duration :	180
Total Marks :	200
Display Marks:	No
Share Answer Key With Delivery Engine :	Yes
Actual Answer Key :	Yes
Change Font Color :	No
Change Background Color :	No
Change Theme :	No
Help Button :	No
Show Reports :	No
Show Progress Bar :	No

ELECTRONICS AND COMMUNICATION ENGINEERING

Group Number :	1
Group Id :	50696131
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 :	506961118
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 :	506961139
Question Shuffling Allowed :	Yes

Question Number : 1 Question Id : 5069616016 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

If $A = \begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$ and if $(aI + bA)^2 = A$, then $b^4 =$

Options :

1. ✖ 1

2. ✖ $\frac{1}{2}$

3. ✖ $-\frac{1}{4}$

4. ✔ $\frac{1}{4}$

Question Number : 2 Question Id : 5069616017 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

If $A = \begin{pmatrix} \cos \theta & \sin \theta & 0 \\ -\sin \theta & \cos \theta & 0 \\ 0 & 0 & 1 \end{pmatrix} = F(\theta)$, then $A^{-1} =$

Options :

1. ✖ $F(\theta)$

2. ✓ $F(-\theta)$

3. ✗ $-F(\theta)$

4. ✗ $-F(-\theta)$

Question Number : 3 Question Id : 5069616018 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If (x, y, z) is the solution of linear equations $x + y + z = 6$,

$x - y + z = 2$, $2x + y - z = 1$, then $\frac{yz}{x} =$

Options :

1. ✗ $\frac{1}{6}$

2. ✗ $\frac{3}{2}$

3. ✓ 6

4. ✗ 3

Question Number : 4 Question Id : 5069616019 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If A and B are square matrices of order 3 with $|A| = 2$, $|B| = -4$, then

$|2AB| =$

Options :

1. ✓ -64

2. ✖ 16

3. ✖ 64

4. ✖ -16

Question Number : 5 Question Id : 5069616020 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

If $\log_{\sqrt{27}}(x) = \frac{8}{3}$, then $x =$

Options :

1. ✖ 10

2. ✖ 16

3. ✔ 81

4. ✖ 27

Question Number : 6 Question Id : 5069616021 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

If $\frac{x^3}{(x-1)(x+2)} = Ax + B + \frac{C}{x-1} + \frac{D}{x+2}$, then $C + D =$

Options :

1. ✖ -3

2. ✔ 3

3. ✖ 2

4. ✖ 0

Question Number : 7 Question Id : 5069616022 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$$\frac{\sin^2 33^\circ - \sin^2 57^\circ}{\sin 21^\circ - \cos 21^\circ} =$$

Options :

1. ✖ $\frac{\sqrt{3}}{2}$

2. ✖ $\frac{1}{2}$

3. ✔ $\frac{1}{\sqrt{2}}$

4. ✖ 1

Question Number : 8 Question Id : 5069616023 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If $A + B = \frac{\pi}{3}$ and $\cos A + \cos B = 1$, then $3\cos(A - B) =$

Options :

1. ✔ -1

2. ✖

2

3. ✖ -2

4. ✖ 1

Question Number : 9 Question Id : 5069616024 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If $2 \tan^{-1} \left(\frac{2}{3} \right) = \tan^{-1}(k)$, then $k =$

Options :

1. ✖ $\frac{5}{12}$ 2. ✖ $\frac{4}{3}$ 3. ✔ $\frac{12}{5}$ 4. ✖ $\frac{3}{4}$

Question Number : 10 Question Id : 5069616025 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If $\tan^{-1} \left(\frac{1-x}{1+x} \right) = \frac{1}{2} \tan^{-1}(x)$, $x > 0$, then $x =$

Options :

1. ✖

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

2. ✓ $\frac{1}{\sqrt{3}}$

3. ✗ $\frac{1}{2}$

4. ✗ 1

Question Number : 11 Question Id : 5069616026 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If $\cosh x = \frac{3}{2}$, then $\cosh 2x =$

Options :

1. ✗ $\frac{1}{3}$

2. ✓ $\frac{7}{2}$

3. ✗ $\frac{5}{2}$

4. ✗ $\frac{11}{3}$

Question Number : 12 Question Id : 5069616027 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$$\left(\frac{\sqrt{3}+i}{2}\right)^6 + \left(\frac{\sqrt{3}-i}{2}\right)^6 =$$

Options :

1. ✖ 3

2. ✖ -3

3. ✖ 2

4. ✔ -2

Question Number : 13 Question Id : 5069616028 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The distance between the lines $y = 2x + 4$ and $6x - 3y = 5$ is (in units)

Options :

1. ✖ $\frac{13}{2\sqrt{5}}$

2. ✔ $\frac{17}{3\sqrt{5}}$

3. ✖ $\frac{17}{2\sqrt{5}}$

4. ✖ $\frac{14}{3\sqrt{5}}$

Question Number : 14 Question Id : 5069616029 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

If the radius of the circle $x^2 + y^2 - 4x + 6y - k = 0$ is 4, then $k =$

Options :

1. ✓ 3

2. ✗ -3

3. ✗ 2

4. ✗ $\frac{1}{2}$

Question Number : 15 Question Id : 5069616030 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

If the angle between the lines $3x - 4y + 1 = 0$ and $ax + by - 7 = 0$ is 90° , then $3a - 4b =$

Options :

1. ✗ 12

2. ✗ -1

3. ✓ 0

4. ✗

7

Question Number : 16 Question Id : 5069616031 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The equation of the tangent to the circle $x^2 + y^2 - 6x + 4y - 12 = 0$ at $(-1,1)$ is

Options :

1. ✖ $4x + 3y + 1 = 0$

2. ✖ $2x - 3y + 5 = 0$

3. ✖ $2x + 3y - 1 = 0$

4. ✔ $4x - 3y + 7 = 0$

Question Number : 17 Question Id : 5069616032 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The eccentricity of the ellipse whose latus rectum is equal to half of its major axis is

Options :

1. ✖ $\sqrt{3}$

2. ✔ $\frac{1}{\sqrt{2}}$

3. ✖ $\sqrt{2}$

4. ✖ $\frac{1}{\sqrt{3}}$

Question Number : 18 Question Id : 5069616033 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

$$\frac{d}{dx} \left(\sqrt{\sin(x^2)} \right) =$$

Options :

1. ✖ $\frac{x^2 \cos(x^2)}{\sqrt{\sin(x^2)}}$

2. ✖ $\frac{x \cos(x^2)}{2\sqrt{\sin(x^2)}}$

3. ✔ $\frac{x \cos(x^2)}{\sqrt{\sin(x^2)}}$

4. ✖ $\frac{x \sin(x^2)}{\sqrt{\cos(x^2)}}$

Question Number : 19 Question Id : 5069616034 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

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

Options :

1. ✖ 2

2. ✖ 4

3. ✖ 1

4. ✔ $\frac{1}{2}$

Question Number : 20 Question Id : 5069616035 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

If $y^x = x^{\cos y}$, then $\frac{dy}{dx} =$

Options :

1. ✔ $\frac{y(\cos y - x \log y)}{x(x + y \sin y \log x)}$

2. ✖ $\frac{y(\cos y + x \log y)}{x(x + y \sin y \log x)}$

3. ✖ $\frac{y(\cos y - x \log y)}{x(x - y \sin y \log x)}$

4. ✖ $\frac{(\cos y - x \log y)}{(x + y \sin y \log x)}$

Question Number : 21 Question Id : 5069616036 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

$$\lim_{x \rightarrow 3} \frac{x^2 - x - 6}{x^2 + x - 12} =$$

Options :

1. ✖ $\frac{1}{6}$

2. ✖ $\frac{2}{3}$

3. ✖ $\frac{3}{4}$

4. ✔ $\frac{5}{7}$

Question Number : 22 Question Id : 5069616037 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The equation of the normal to the curve $y = x^3 - 3x$ at the point P(2, 2) is

Options :

1. ✖ $x + 9y - 2 = 0$

2. ✖ $x + 9y - 22 = 0$

3. ✔ $x + 9y - 20 = 0$

4. ✖ $x + 9y - 12 = 0$

Question Number : 23 Question Id : 5069616038 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The maximum value of $y = (x - 1)^2 e^x$ is

Options :

1. ✓ $\frac{4}{e}$

2. ✗ $\frac{2}{e}$

3. ✗ $\frac{1}{e}$

4. ✗ $\frac{9}{e}$

Question Number : 24 Question Id : 5069616039 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

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

Options :

1. ✗ $8e^4$

2. ✗ $4e^4$

3. ✓ $9e^4$

4. ✗ $16e^4$

Question Number : 25 Question Id : 5069616040 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

If $u(x, y) = \sin^{-1}\left(\frac{x^4 + y^4}{x^2 + y^2}\right)$, then $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y} =$

Options :

1. ✖ $2 \cot u$

2. ✔ $2 \tan u$

3. ✖ $2 \sin u$

4. ✖ $2 \cos u$

Question Number : 26 Question Id : 5069616041 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

$\int \frac{1}{(1 - \cos x)} dx =$

Options :

1. ✔ $-\cot x - \operatorname{cosec} x + c$

2. ✖ $-\cot x + \operatorname{cosec} x + c$

3. ✖ $\cot x - \operatorname{cosec} x + c$

4. ✖ $-\tan x - \sec x + c$

Question Number : 27 Question Id : 5069616042 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$$\int_2^4 f(x) dx =$$

Options :

1. ✖ $\int_2^4 f(6+x) dx$

2. ✖ $\int_2^4 f(4-x) dx$

3. ✖ $\int_2^4 f(2-x) dx$

4. ✔ $\int_2^4 f(6-x) dx$

Question Number : 28 Question Id : 5069616043 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$$\int_{-1}^1 \sin \pi x dx =$$

Options :

1. ✖ $\frac{1}{\pi}$

2. ✖ $\frac{2}{\pi}$

3. ✓ 0

4. ✗ $-\frac{2}{\pi}$

Question Number : 29 Question Id : 5069616044 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

$$\lim_{n \rightarrow \infty} \left[\frac{1}{n} + \frac{n^2}{(n+1)^3} + \frac{n^2}{(n+2)^3} + \dots + \frac{1}{8n} \right] =$$

Options :

1. ✗ $\frac{1}{8}$

2. ✗ $\frac{1}{4}$

3. ✓ $\frac{3}{8}$

4. ✗ $\frac{1}{2}$

Question Number : 30 Question Id : 5069616045 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The area of the region bounded by the lines $x = 1, x = 4, y = 4x$ and $y = x^2$ is

Options :

1. ✗ 2

2. ✖ 6

3. ✖ 16

4. ✔ 9

Question Number : 31 Question Id : 5069616046 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

According to Simpson's $\frac{1}{3}$ rule, the value of the integral $\int_1^3 \frac{1}{x} dx$ with $h = \frac{1}{2}$, is

Options :

1. ✖ 1.5

2. ✖ 0.5

3. ✔ 1.1

4. ✖ 2

Question Number : 32 Question Id : 5069616047 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

The differential equation whose general solution is $y = Ax^2 + Bx$, where A and B are arbitrary constants is

Options :

1. ✖ $x^2 y'' + 2xy' - 2y = 0$

2. ✓ $x^2 y'' - 2xy' + 2y = 0$

3. ✗ $y'' - 2y' + 2y = 0$

4. ✗ $x^2 y'' - 2xy' - 2y = 0$

Question Number : 33 Question Id : 5069616048 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The general solution of the differential equation
 $(e^x + 1)y \, dy + (y + 1) \, dx = 0$ is

Options :

1. ✗ $e^{x-y} = c(y + 1)(1 - e^x)$

2. ✓ $e^{x+y} = c(y + 1)(1 + e^x)$

3. ✗ $e^{2x-y} = c(y + 1)(1 - e^x)$

4. ✗ $e^{x+y} = cy(1 + e^x)$

Question Number : 34 Question Id : 5069616049 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

If the differential equation $(x^2 + y^2)dx + kxy \, dy = 0$ is exact, then k =

Options :

1. ✓ 2

2. ✖ 1

3. ✖ -1

4. ✖ -2

Question Number : 35 Question Id : 5069616050 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The general solution of the differential equation $\frac{dy}{dx} + y \tan x = \cos^2 x$ is

Options :

1. ✖ $y \cot x = \tan x + c$

2. ✖ $y \sec x = x \sin x + c$

3. ✖ $x \sec x = \sin x + c$

4. ✔ $y \sec x = \sin x + c$

Question Number : 36 Question Id : 5069616051 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

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

Options :

1. ✖ $2x$

2. ✖ $x^2 + 2$

3. ✔ $x^2 + 1$

4. ✖ $x^2 - 1$

Question Number : 37 Question Id : 5069616052 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The general solution of the differential equation $6y'' - 5y' - 6y = 0$ is

Options :

1. ✖ $y = ae^{9x} + be^{4x}$

2. ✖ $y = ae^{-9x} + be^{-4x}$

3. ✔ $y = ae^{\frac{3x}{2}} + be^{\frac{-2x}{3}}$

4. ✖ $y = ae^{\frac{-3x}{2}} + be^{\frac{-2x}{3}}$

Question Number : 38 Question Id : 5069616053 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A particular integral of the differential equation $(4D^2 + 4D - 3)y = e^{3x}$ is

(Here $D \equiv \frac{d}{dx}$)

Options :

1. ✖ $\frac{1}{11}e^{3x}$

2. ✓ $\frac{1}{45} e^{3x}$

3. ✗ $\frac{1}{5} e^{3x}$

4. ✗ $\frac{1}{3} e^{3x}$

Question Number : 39 Question Id : 5069616054 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A particular integral of the differential equation

$$(D^2 + 4)y = 5(\cos 3x + \sin 3x) \text{ is}$$

$$\left(\text{Here } D \equiv \frac{d}{dx} \right)$$

Options :

1. ✗ $\cos 3x + \sin 3x$

2. ✗ $\cos 3x - \sin 3x$

3. ✓ $-\cos 3x - \sin 3x$

4. ✗ $\sin 3x - \cos 3x$

Question Number : 40 Question Id : 5069616055 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If $L\left\{\int_0^t \cosh 3u \, du\right\} = f(s)$, then $f(4) =$

Options :

1. ✓ $\frac{1}{7}$

2. ✗ $\frac{1}{32}$

3. ✗ 0

4. ✗ $\frac{7}{32}$

Question Number : 41 Question Id : 5069616056 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Let $F(t) = \begin{cases} e^{t-1}, & t > 1 \\ 0, & t < 1 \end{cases}$. If $s > 1$ then $L\{F(t)\} =$

Options :

1. ✗ $\frac{1}{s-1}$

2. ✗ $\frac{e^{-1}}{s-1}$

3. ✓ $\frac{e^{-s}}{s-1}$

4. ✗

$$\frac{e^s}{s-1}$$

Question Number : 42 Question Id : 5069616057 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$$\int_0^{\infty} t e^{-t} \sin t \, dt =$$

Options :

1. ✖ -1

2. ✔ $\frac{1}{2}$

3. ✖ 0

4. ✖ 2

Question Number : 43 Question Id : 5069616058 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$$L^{-1} \left\{ \frac{1}{s(s-1)} \right\} =$$

Options :

1. ✖ $1 - e^t$

2. ✖ $e^t + 1$

3. ✖

$$e^{-t} - 1$$

4. ✓ $e^t - 1$

Question Number : 44 Question Id : 5069616059 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

If $L^{-1} \left\{ \frac{s+1}{s^2+2s+2} \right\} = e^{at} \cos bt$, then $a^2 + b^2 =$

Options :

1. ✓ 2

2. ✗ 4

3. ✗ 0

4. ✗ 8

Question Number : 45 Question Id : 5069616060 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

The convolution of the functions 1 and $\sin t$ is

Options :

1. ✓ $1 - \cos t$

2. ✗ $1 - \sin t$

3. ✗

$\cos t$

4. ✖ $1 + \cos t$

Question Number : 46 Question Id : 5069616061 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

The Laplace transform of the solution of the initial value problem

$y'' + 9y = 9u(t - 3), y(0) = 0, y'(0) = 0$ (Here $u(t - 3)$ is the unit step function) is

Options :

1. ✖ $\frac{9e^{3s}}{s(s^2 - 9)}$

2. ✖ $\frac{e^{-3s}}{s^2(s^2 + 9)}$

3. ✖ $\frac{9e^{-3s}}{(s^2 + 9)^2}$

4. ✔ $\frac{9e^{-3s}}{s(s^2 + 9)}$

Question Number : 47 Question Id : 5069616062 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

$$\int_{-\frac{\pi}{2}}^{\frac{3\pi}{2}} \cos^2 4x \, dx =$$

Options :

1. ✓ π

2. ✗ 3π

3. ✗ 2π

4. ✗ $\frac{\pi}{2}$

Question Number : 48 Question Id : 5069616063 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The value of a_3 in the Fourier series expansion of the function

$$f(x) = \begin{cases} 0, & -\pi < x \leq 0 \\ x, & 0 < x \leq \pi \end{cases}$$

Options :

1. ✗ $\frac{-2}{\pi}$

2. ✗ $\frac{-2}{3\pi}$

3. ✗ $\frac{-2}{5\pi}$

4. ✓ $\frac{-2}{9\pi}$

Question Number : 49 Question Id : 5069616064 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

The value of b_1 in the Fourier series expansion of $f(x) = x \sin x$ in $0 \leq x \leq 2\pi$ is

Options :

1. ✓ π

2. ✗ 2π

3. ✗ 3π

4. ✗ 4π

Question Number : 50 Question Id : 5069616065 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

The period of the function $f(x) = \sin\left(\frac{\pi x}{3}\right)$ is

Options :

1. ✗ π

2. ✗ $\frac{\pi}{3}$

3. ✖ $\frac{\pi}{6}$

4. ✔ 6

Physics

Section Id :	506961119
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 :	506961140
Question Shuffling Allowed :	Yes

Question Number : 51 Question Id : 5069616066 Question Type : MCQ Option Shuffling : Yes
 Display Question Number : Yes
 Correct Marks : 1 Wrong Marks : 0

Velocity (v) of water waves depends on their Wavelength (λ), Density of Water (ρ) and acceleration due to gravity (g). By the method of dimensional analysis, the relation between these quantities is given by

Options :

1. ✖ v^2 is proportional to $(\rho\lambda g)$

2. ✖ v is proportional to $\lambda g/\sqrt{\rho}$

3. ✔ v^2 is proportional to (λg)

v is proportional to $(\rho\lambda g)$

4. ✖

Question Number : 52 Question Id : 5069616067 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The Force $\vec{F} = 2\hat{i} + 3\hat{j} + 7\hat{k}$ newtons (N), acting on an object causes a displacement $\vec{S} = 2\hat{i} + 3\hat{j} + 5\hat{k}$ meters (m). Then the work done is

Options :

1. ✖ 30 Nm

2. ✖ 40 Nm

3. ✔ 48 Nm

4. ✖ 25 Nm

Question Number : 53 Question Id : 5069616068 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$\vec{A} = \hat{i} + 2\hat{j} + 3\hat{k}$ and $\vec{B} = 3\hat{i} + 2\hat{j} + \hat{k}$ are the adjacent sides of a parallelogram respectively. The area of the Parallelogram is

Options :

1. ✖ $8\sqrt{2}$

2. ✔ $8\sqrt{3}$

3. ✖ $3\sqrt{8}$

4. ✖ $\sqrt{8}$

Question Number : 54 Question Id : 5069616069 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A block is placed on a rough floor and a horizontal force 'F' is applied on it. The force of friction 'f' by the floor on the block is measured for different values of 'F'. The graph between the 'f' and 'F' would be

Options :

1. ✖ The graph is a straight line of slope 45° for all 'F'
2. ✖ The graph is a straight line parallel to 'F' axis for all 'F'
3. ✔ The graph is a straight line of slope 45° for small values of 'F' and straight line parallel to 'F' axis for large 'F'
4. ✖ The graph is exponential with values of 'F'

Question Number : 55 Question Id : 5069616070 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Throughout the flight of a particle in projectile motion

Options :

1. ✔ The horizontal component of velocity is constant
2. ✖ The vertical component of velocity is constant
3. ✖ The horizontal component of velocity decreases

The horizontal component of velocity is zero

4. ✖

Question Number : 56 Question Id : 5069616071 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A motor cyclist driving with a speed of 0.6 km/minute goes over a turn of radius of curvature 10 m. His slope with vertical in degrees (take $g = 10 \text{ m/sec}^2$).

Options :

1. ✖ 0°

2. ✖ 30°

3. ✔ 45°

4. ✖ 60°

Question Number : 57 Question Id : 5069616072 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Two wires of lengths in the ratio 2:3 taken from same material and having the same mass are stretched by same force. Then their elongations are in the ratio of

Options :

1. ✖ 2:3

2. ✖ 3:2

3. ✖ 1:2

4. ✔

4:9

Question Number : 58 Question Id : 5069616073 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following statements is wrong?

Options :

1. ✖ Surface Tension of a liquid decreases with increase of temperature
2. ✖ Surface Tension of a liquid increases or decreases depending on the type of impurities added to the liquid
3. ✔ Angle of Contact depends on the inclination of the solid rod placed in the liquid
4. ✖ A drop of oil placed on the surface of water will spread as a thin layer

Question Number : 59 Question Id : 5069616074 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A streamline flow is maintained across the two capillary tubes A and B connected in series. The length of B is twice that of A and the radius of B is half that of A. The pressure across A is P. The pressure across B is

Options :

1. ✖ 4P
2. ✖ 16P
3. ✔ 32P

4. ✖ P/32

Question Number : 60 Question Id : 5069616075 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A body of mass 0.1 kg is thrown vertically upward. At a certain point above the ground, the Potential energy and Kinetic energy of the body are 3.7 J and 6.3 J. The maximum height it reaches is ($g=10\text{m/s}^2$)

Options :

- 1. ✔ 10 m
- 2. ✖ 4 m
- 3. ✖ 100 m
- 4. ✖ 0.7 m

Question Number : 61 Question Id : 5069616076 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Two containers of volumes 20m^3 and 30m^3 have gases at Pressures of 40 MPa and 50 MPa. The two containers are connected by a very narrow pipe of negligible volume and the gases are allowed to intermingle. If the temperature remains constant, the final pressure in MPa is

Options :

- 1. ✔ 46
- 2. ✖ 40
- 3. ✖ 50
- 4. ✖

Question Number : 62 Question Id : 5069616077 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

During an adiabatic process, a mono atomic gas at 27°C is compressed suddenly to $1/8$ of its original volume. Then the Final temperature in $^{\circ}\text{C}$ is (The ratio of the two specific heats of gases = $5/3$)

Options :

1. ✖ 1160

2. ✖ 887

3. ✔ 927

4. ✖ 88

Question Number : 63 Question Id : 5069616078 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The time period of a simple pendulum is 3 sec. Its length is made 4 times. Then its time period is

Options :

1. ✖ 3 sec

2. ✖ 4 sec

3. ✔ 6 sec

4. ✖ 1.5 sec

Question Number : 64 Question Id : 5069616079 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A particle executes Simple Harmonic Motion with an amplitude of 5 cm. When the particle is at 4 cm from the mean position, the magnitude of its velocity in SI units is equal to that of its acceleration. Then, its periodic time in seconds is

Options :

1. ✓ $8\pi/3$

2. ✗ $4\pi/3$

3. ✗ $3\pi/8$

4. ✗ $7\pi/3$

Question Number : 65 Question Id : 5069616080 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The two equations of Simple Harmonic Motions are $Y_1 = 12 \sin(50t + \pi/2)$ and $Y_2 = 12 \sin(50t + \pi/3)$. The phase difference between two motions is

Options :

1. ✗ $\pi/2$

2. ✗ $\pi/3$

3. ✓ $\pi/6$

4. ✗ $\pi/8$

Question Number : 66 Question Id : 5069616081 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Multiple reflections leading to persistence of sound in an auditorium are

Options :

1. ✖ beats
2. ✖ echo
3. ✔ reverberation
4. ✖ stationary waves

Question Number : 67 Question Id : 5069616082 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Two sources S_1 and S_2 are moving with certain velocities. The apparent frequencies observed by a stationary observer are double and half of their original frequencies respectively. If the velocity of sound is v and velocity of wind is zero, then the velocities of two sources respectively are

Options :

1. ✖ $v/2$ and $2v$
2. ✖ v and $v/2$
3. ✖ $3v/2$ and $2v$
4. ✔ $v/2$ and v

Question Number : 68 Question Id : 5069616083 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The Moment of couple acting on a bar magnet kept at an angle 30° to the direction of uniform magnetic field of induction 2 Tesla is equal to

Options :

1. ✖ Pole Strength of the Magnet
2. ✖ Length of the Magnet
3. ✖ Magnetic Flux
4. ✔ Magnetic Moment of the Magnet

Question Number : 69 Question Id : 5069616084 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In a Meter Bridge, R_1 and R_2 are the resistances connected in the left and right gaps respectively. The bridge is balanced at the balancing point of 60 cm from left. When a resistance of $30\ \Omega$ is connected in parallel to R_2 , the balancing point shifted to 90 cm. The values of R_1 and R_2 respectively are (in Ω)

Options :

1. ✖ 30 and 50
2. ✖ 200 and 350
3. ✔ 225 and 150
4. ✖ 100 and 75

Question Number : 70 Question Id : 5069616085 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

When 220 V AC is applied across a step-up transformer, it draws a current of 3A in the secondary. If the number of turns in the primary coil of the transformer is 100 and that of secondary coil is 2000. The output power of the transformer is

Options :

1. ✖ 8800 W
2. ✔ 13200 W
3. ✖ 4400 W
4. ✖ 2200 W

Question Number : 71 Question Id : 5069616086 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A photon of frequency ν is incident on a photosensitive metal surface whose threshold frequency is ν_0 . The kinetic energy of emitted photo electron is

Options :

1. ✖ $h \cdot \nu$
2. ✖ $h \cdot \nu_0$
3. ✔ $h \cdot (\nu - \nu_0)$
4. ✖ $h \cdot (\nu + \nu_0)$

Question Number : 72 Question Id : 5069616087 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In LASER, the condition of Population Inversion mean

Options :

1. ✖ The number of atoms in the lower energy state are more than the higher energy state
2. ✔ The number of atoms in the higher energy state are more than the lower energy state
3. ✖ The number of atoms in the lower and higher energy states are same
4. ✖ The number of atoms in higher energy state are zero

Question Number : 73 Question Id : 5069616088 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In a Graded Index Optical Fibre

Options :

1. ✖ The Refractive Index of the core remains constant and will be greater than that of the cladding
2. ✖ The Refractive Index of the core remains constant and will be less than that of the cladding
3. ✖ The Refractive Indices of both core and cladding remain constant and are equal
4. ✔ The Refractive Index of the core varies with maximum at the centre and decreases as the radial distance increases from the axis of the core

Question Number : 74 Question Id : 5069616089 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following statements is correct, if n_e and n_h are the concentrations of the Electrons and Holes respectively

Options :

1. ✓ In an intrinsic semiconductor, $n_e = n_h$ and both these charge carriers contribute to current equally
2. ✗ In p-type semiconductor, $n_e > n_h$ and the current due to electrons is more than that of holes
3. ✗ In n-type semiconductor, $n_p > n_e$ and current due to holes is more than that of electrons
4. ✗ In an extrinsic semiconductor, $n_e = n_h$ and both these charge carriers contribute to current equally

Question Number : 75 Question Id : 5069616090 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The semiconductors used for fabrication of visible LEDs have band gap

Options :

1. ✗ Close to 1.5 eV
2. ✗ Close to 1.1 eV
3. ✗ About 1.0 ev to 1.6 eV
4. ✓ About 1.8 eV to 3 eV

Chemistry

Section Id :	506961120
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 :	506961141
Question Shuffling Allowed :	Yes

Question Number : 76 Question Id : 5069616091 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

According to Aufbau principle, which orbital is filled immediately after each of the 3p, 4p, 4f and 5d?

Options :

1. ✖ 3d, 5s, 5d, 6p
2. ✖ 3d, 4d, 5d, 6p
3. ✔ 4s, 5s, 5d, 6p
4. ✖ 4s, 5s, 5d, 7s

Question Number : 77 Question Id : 5069616092 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which one of the following properties is not due to hydrogen bonding.

Options :

1. ✖

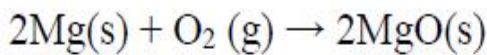
High boiling point of water

- 2. ✖ High viscosity of glycerol
- 3. ✖ Solubility of ammonia in water
- 4. ✔ Polar nature of halogen acid

Question Number : 78 Question Id : 5069616093 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0



In above reaction equation, the oxidation state of magnesium is changed from

Options :

- 1. ✔ 0 to +2
- 2. ✖ 0 to -2
- 3. ✖ +2 to -1
- 4. ✖ +2 to 0

Question Number : 79 Question Id : 5069616094 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

100 mL of ethanol, whose density is 1.2 g.mL^{-1} is diluted to 1.0 L by addition of distilled water. Molarity of the resultant solution is

Options :

1. ✖ 1.60
2. ✔ 2.60
3. ✖ 0.46
4. ✖ 2.90

Question Number : 80 Question Id : 5069616095 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Among the below options, which is not a characteristic of a colloid

Options :

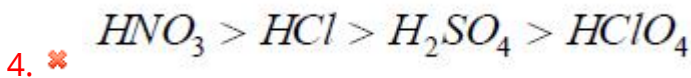
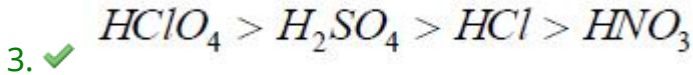
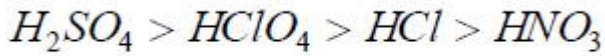
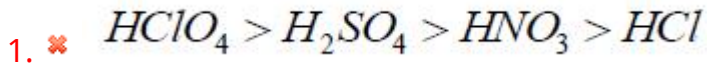
1. ✖ Particle size between $10 \text{ \AA} - 1000 \text{ \AA}$
2. ✖ Heterogeneous
3. ✔ Can be separable by filtration
4. ✖ Diffuse slowly

Question Number : 81 Question Id : 5069616096 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The correct order of decreasing strength of acids is

Options :



Question Number : 82 Question Id : 5069616097 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The solution which can resist change in its pH on the addition of an acid or a base is known as

Options :

1. ✖ Isotonic solution

2. ✖ Colloidal solution

3. ✖ Neutral solution

4. ✔ Buffer solution

Question Number : 83 Question Id : 5069616098 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The minimum level of a pollutant above which a healthy individual worker is adversely affected on exposure to it for eight hours in a day is called

Options :

1. ✖ Critical Limit Value
2. ✖ Toxic Limit Value
3. ✔ Threshold Limit Value
4. ✖ Dangerous Limit Value

Question Number : 84 Question Id : 5069616099 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The consequences of global warming are:

- (A) Increase in average temperature of the earth
- (B) Melting of Himalayan glaciers
- (C) Increased Biochemical Oxygen Demand of natural water
- (D) Eutrophication of water bodies

Choose the correct option.

Options :

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

Question Number : 85 Question Id : 5069616100 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The chemicals used for defluoridation of water by Nalgonda Technique are

Options :

1. ✖ CaO and CaOCl_2
2. ✔ Alum, CaO and CaOCl_2
3. ✖ CaH_2 , NaOCl and Alum
4. ✖ NaOCl, NaH and Alum

Question Number : 86 Question Id : 5069616101 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The process which removes non-ionic, ionic, colloidal and organic matter in water is

Options :

1. ✖ Ion exchange process
2. ✖ Lime soda process
3. ✔ Reverse osmosis process
4. ✖ Zeolite process

Question Number : 87 Question Id : 5069616102 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The set of products that are formed during electrolysis of aqueous solution of KCl between platinum electrodes is

Options :

1. ✖ HCl and KOH
2. ✖ KOH and Cl₂
3. ✔ KOH, Cl₂ and H₂
4. ✖ K and Cl₂

Question Number : 88 Question Id : 5069616103 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

When same quantity of electricity is passed through aqueous AgNO₃ and H₂SO₄ solutions connected in series, 5.04×10^{-2} g of H₂ is liberated. What is the mass of silver (in grams) deposited?
(Eq. Wt. of hydrogen and silver is 1.008 and 108 respectively)

Options :

1. ✖ 54
2. ✖ 0.54
3. ✔ 5.4
4. ✖ 10.8

Question Number : 89 Question Id : 5069616104 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Choose the correct option that differentiates metals from non-metals

Options :

Metals form acidic oxides, whereas non-metals form basic oxides.

1. ✖

Metals have a tendency to gain electrons, whereas non-metals have a tendency to lose electrons.

2. ✖

Metals are generally good conductors of electricity, whereas non-metals are insulators.

3. ✔

All metals exist in a solid state at room temperature.

4. ✖

Question Number : 90 Question Id : 5069616105 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Nichrome is commonly used in heating elements because

Options :

It has high electrical conductivity

1. ✖

It has a high melting point and corrosion resistance

2. ✔

It is lightweight

3. ✖

It is brittle and hard

4. ✖

Question Number : 91 Question Id : 5069616106 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

_____ combinations is used for prevention of corrosion.

Options :

1. ✓ ☒ Phosphorous or Antimony
2. ✗ ☐ Phosphorous or Chlorine
3. ✗ ☐ Antimony or Nitrogen
4. ✗ ☐ Antimony or Sodium

Question Number : 92 Question Id : 5069616107 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The process of coating zinc metal over iron to improve corrosion resistance of iron is called

Options :

1. ✗ ☐ Electroplating
2. ✗ ☐ Annealing
3. ✓ ☒ Galvanizing
4. ✗ ☐ Tinning

Question Number : 93 Question Id : 5069616108 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

_____ is a cross linked polymer.

Options :

1. ✓ Bakelite
2. ✗ LDPE
3. ✗ Polystyrene
4. ✗ PVC

Question Number : 94 Question Id : 5069616109 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Identify the Biodegradable polymers from the following and choose the correct option.

(I) PVC (II) PHBV (III) Polypropylene (IV) Nylon-2-nylon-6

Options :

1. ✗ I and II
2. ✓ II and IV
3. ✗ I and IV
4. ✗ I, II and III

Question Number : 95 Question Id : 5069616110 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Calculate the amount of oxygen required for the complete combustion of 1 mole of Methane (CH_4).

Options :

1. ✖ 1 mole
2. ✔ 2 moles
3. ✖ 3 moles
4. ✖ 4 moles

Question Number : 96 Question Id : 5069616111 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

_____ represents the composition of water gas

Options :

1. ✔ $\text{CO} + \text{H}_2$
2. ✖ $\text{CO}_2 + \text{H}_2$
3. ✖ $\text{CO} + \text{CH}_4$
4. ✖ $\text{CO}_2 + \text{CH}_4$

Question Number : 97 Question Id : 5069616112 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Match the following and choose the correct option.

List – I

List – II

a) Hydrogen electrode

(i) $\text{Pt} \mid \text{Fe}^{3+}, \text{Fe}^{2+}$

b) Standard hydrogen electrode

(ii) $\text{Fe} \mid \text{Fe}^{2+}$

c) Metal-metal ion electrode

(iii) pH measurement

d) Glass electrode

(iv) $\text{Pt}, \text{H}_2 (2 \text{ bar}) \mid \text{H}^+ (0.1\text{M})$

(v) $\text{Pt}, \text{H}_2 (1 \text{ bar}) \mid \text{H}^+ (1.0\text{M})$

(vi) Oxidation electrode

Options :

1. ✖ a – iii, b – v, c – i, d – vi

2. ✖ a – v, b – iv, c – ii, d – iii

3. ✖ a – v, b – iii, c – i, d – vi

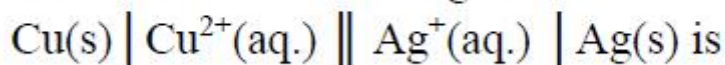
4. ✔ a – iv, b – v, c – ii, d – iii

Question Number : 98 Question Id : 5069616113 Question Type : MCQ Option Shuffling : Yes

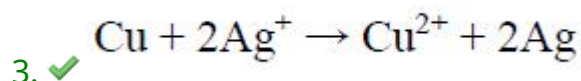
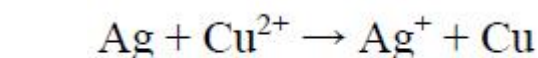
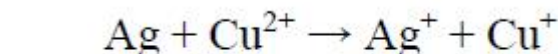
Display Question Number : Yes

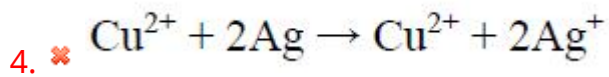
Correct Marks : 1 Wrong Marks : 0

The cell reaction of the galvanic cell



Options :





Question Number : 99 Question Id : 5069616114 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

_____ is used to reduce water pollution.

Options :

1. ✖ Neem
2. ✖ Watermelon
3. ✔ Water hyacinth
4. ✖ People

Question Number : 100 Question Id : 5069616115 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following can cause soil pollution

Options :

1. ✔ DDT
2. ✖ CO_2
3. ✖ NO_2
4. ✖ Nitrogen

Electronics and Communication Engineering

Section Id :	506961121
Section Number :	4
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	100
Number of Questions to be attempted :	100
Section Marks :	100
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	506961142
Question Shuffling Allowed :	Yes

Question Number : 101 Question Id : 5069616116 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Drift current in the semiconductors depends upon _____

Options :

1. ✖ only the electric field
2. ✖ only the carrier concentration gradient
3. ✔ both the electric field and the carrier concentration
4. ✖ both the electric field and the carrier concentration gradient

Question Number : 102 Question Id : 5069616117 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following is NOT associated with a P-N junction

Options :

1. ✖ Junction Capacitance
2. ✖ Charge Storage Capacitance

3. ✖ Depletion Capacitance

4. ✔ Channel Length Modulation

Question Number : 103 Question Id : 5069616118 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In a FET, the relation between the amplification factor (μ), dynamic drain resistance (r_d), and transconductance (g_m) is

Options :

1. ✖ $\mu = r_d / g_m$

2. ✖ $g_m = r_d + \mu$

3. ✔ $\mu = r_d * g_m$

4. ✖ $g_m = r_d * \mu$

Question Number : 104 Question Id : 5069616119 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The ratio of change in drain current (ΔI_D) to the change in gate-source voltage (ΔV_{GS}) is

Options :

1. ✖ output conductance

2. ✔ trans conductance

3. ✖ trans resistance

4. ✖ output resistance

Question Number : 105 Question Id : 5069616120 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The use of coupling capacitor in CE amplifier is

Options :

- 1. ✔ to block DC
- 2. ✖ to allow low frequency without any attenuation
- 3. ✖ to shift Q point
- 4. ✖ to allow DC

Question Number : 106 Question Id : 5069616121 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following parameters of P-N junction diode increases with temperature.

Options :

- 1. ✖ Cut in voltage
- 2. ✔ Reverse saturation current
- 3. ✖ Ideality factor
- 4. ✖ Diode Resistance

Question Number : 107 Question Id : 5069616122 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Trans resistance amplifier has

Options :

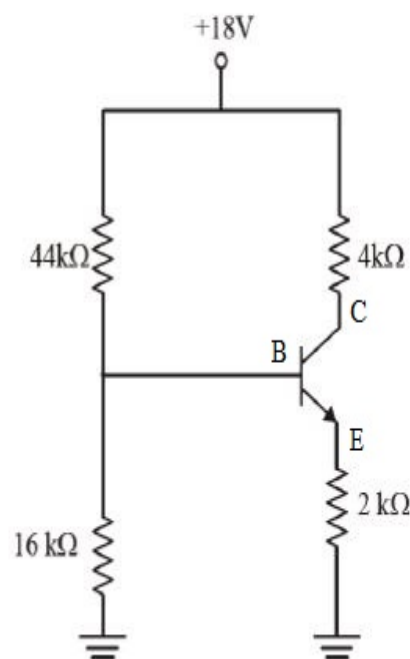
1. ✖ high input impedance & low output impedance
2. ✖ high input impedance & high output impedance
3. ✖ low input impedance & high output impedance
4. ✔ low input impedance & low output impedance

Question Number : 108 Question Id : 5069616123 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Consider the circuit shown in figure. Assume base-to-emitter voltage $V_{BE} = 0.8V$ and common base current gain (α) of the transistor is unity. The value of the collector-to-emitter voltage V_{CE} (in volts) is



Options :

1. ✔ 6V

2. ✖ 8V

3. ✖ 10V

4. ✖ 4V

Question Number : 109 Question Id : 5069616124 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A transistor has an I_C of 100 mA and I_B of 0.5 mA. What is the value of α_{dc} ?

Options :

1. ✖ 0.565

2. ✖ 0.754

3. ✖ 1.24

4. ✔ 0.995

Question Number : 110 Question Id : 5069616125 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The Peak Inverse Voltage (PIV) of a non-conducting diode in a bridge rectifier is

Options :

1. ✖ Twice the peak value of the ac input

2. ✖ Half the peak value of the ac input

3. ✔ The peak value of the ac input

4. ✖ Four times the peak value of the ac input

Question Number : 111 Question Id : 5069616126 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

For a BJT, the common base current gain $\alpha = 0.98$ and the collector base junction reverse bias saturation current $I_{CO} = 0.6 \mu A$. This BJT is connected in the common emitter mode and operated in the active region with a base drive current $I_B = 20 \mu A$. The collector current I_C for this mode of operation is

Options :

1. ✖ 0.98 mA
2. ✖ 0.99 mA
3. ✖ 1.0 mA
4. ✔ 1.01 mA

Question Number : 112 Question Id : 5069616127 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Determine the resistance R required to achieve an output pulse duration of $100 \mu s$ in a monostable circuit utilizing a 10 nF capacitor C with a 555 timer.

Options :

1. ✖ 13.3 $k\Omega$
2. ✖ 15.9 $k\Omega$
3. ✔ 9.09 $k\Omega$
4. ✖ 19.14 $k\Omega$

Question Number : 113 Question Id : 5069616128 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Gain in transistor amplifiers decreases at high frequencies due to

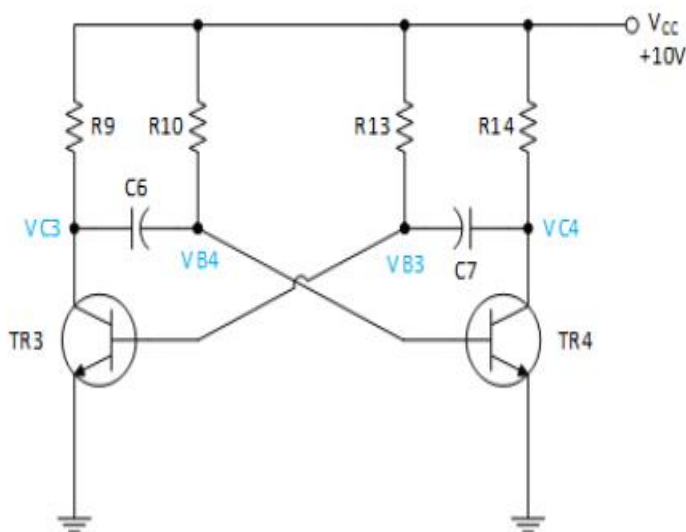
Options :

1. ✖ Short circuit of external coupling capacitors
2. ✖ Open circuit of internal junction capacitors
3. ✔ Short circuit of internal junction capacitors
4. ✖ Open circuit of external coupling capacitors

Question Number : 114 Question Id : 5069616129 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The circuit shown in figure represents the



Options :

1. ✖ Monostable multivibrator
2. ✔

Astable multivibrator

3. ✖ Bistable multivibrator

4. ✖ Feedback Amplifier

Question Number : 115 Question Id : 5069616130 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A diode for which you can change the reverse bias, and thus vary the capacitance is called as _____

Options :

1. ✖ Tunnel diode

2. ✔ Varactor diode

3. ✖ Zener diode

4. ✖ Switching diode

Question Number : 116 Question Id : 5069616131 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The fundamental condition for clamping, if RC is an RC network's time constant and T is the period of the input signal

Options :

1. ✖ $RC \ll T$

2. ✔ $RC \gg T$

3. ✖

RC == T

No such condition

4. ✖

Question Number : 117 Question Id : 5069616132 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Given that the pinch-off voltage for an n-channel JFET is -4 volts, determine the V_{DS} value at which pinch-off occurs when V_{GS} is -1 volt.

Options :

1. ✔ 3 V

2. ✖ 5 V

3. ✖ 4 V

4. ✖ 1 V

Question Number : 118 Question Id : 5069616133 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Virtual ground concept is valid only for operational amplifier with _____ feedback

Options :

1. ✖ Positive

2. ✔ Negative

3. ✖ Zero

4. ✖ Positive and Negative

Question Number : 119 Question Id : 5069616134 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Super position theorem is applicable for _____

Options :

1. ✖ linear and unilateral networks
2. ✖ nonlinear and unilateral networks
3. ✔ linear and bilateral networks
4. ✖ nonlinear and bilateral networks

Question Number : 120 Question Id : 5069616135 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The equivalent resistance of four resistors joined in parallel is $20\ \Omega$. The currents flowing through them are 0.6 A , 0.3 A , 0.2 A and 0.1 A . The lowest value of resistor is

Options :

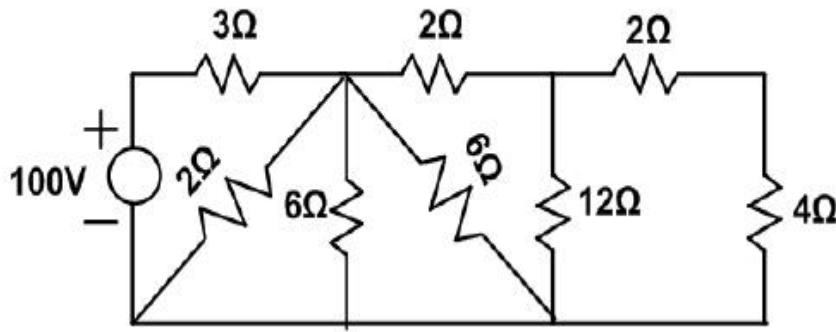
1. ✔ $40\ \Omega$
2. ✖ $80\ \Omega$
3. ✖ $20\ \Omega$
4. ✖ $240\ \Omega$

Question Number : 121 Question Id : 5069616136 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The equivalent resistance of the circuit shown in figure is



Options :

1. ✓ 4Ω
2. ✗ 5Ω
3. ✗ 6Ω
4. ✗ 10Ω

Question Number : 122 Question Id : 5069616137 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A circuit consists of 6 nodes, 9 branches and 3 independent loops. Determine the number of tree branches (b) and links (l) in the graph?

Options :

1. ✗ $b = 4$ and $l = 5$
2. ✗ $b = 5$ and $l = 3$
3. ✗ $b = 3$ and $l = 6$
4. ✓ $b = 5$ and $l = 4$

Question Number : 123 Question Id : 5069616138 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

When a source is delivering maximum power to a load, the efficiency of the circuit

Options :

1. ✓ is always 50%
2. ✗ is always 75%
3. ✗ depends on the circuit parameters
4. ✗ is always 100%

Question Number : 124 Question Id : 5069616139 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

An RC high-pass circuit has $C = 0.01 \mu\text{F}$ and cutoff frequency $f_c = 15.9 \text{ kHz}$.
The R value is

Options :

1. ✗ $4 \text{ k}\Omega$
2. ✗ $3 \text{ k}\Omega$
3. ✗ $2 \text{ k}\Omega$
4. ✓ $1 \text{ k}\Omega$

Question Number : 125 Question Id : 5069616140 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

What would be the value of power factor for series RLC circuit under the resonance phenomenon?

Options :

1. ✖ 0
2. ✖ 0.5
3. ✔ 1
4. ✖ Infinity

Question Number : 126 Question Id : 5069616141 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A transmission line is terminated with its characteristic impedance. The reflection coefficient, VSWR respectively are _____, _____.

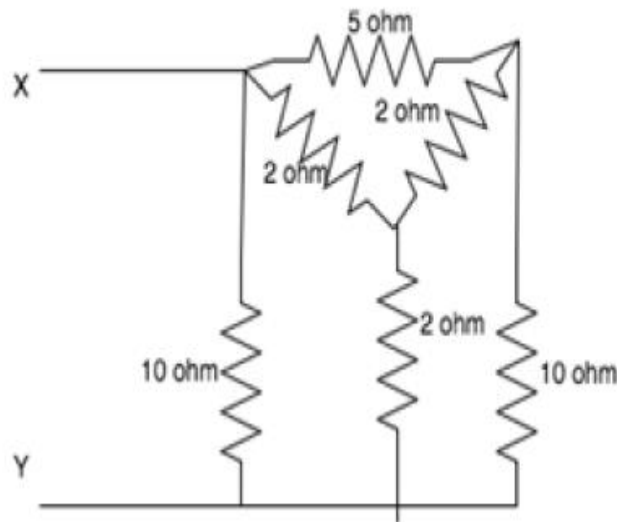
Options :

1. ✖ 1, 1
2. ✖ -1, 0
3. ✔ 0, 1
4. ✖ 1, 0

Question Number : 127 Question Id : 5069616142 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Find the equivalent resistance between X and Y in the given circuit.



Options :

1. ✗ 3.33 Ω
2. ✓ 2.38 Ω
3. ✗ 5.65 Ω
4. ✗ 4.34 Ω

Question Number : 128 Question Id : 5069616143 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A Radio Frequency (RF) circuit has a transmitting antenna with impedance 50 Ω and a receiving antenna with impedance 75 Ω . If the transmitting antenna receives 1 mW when the receiving antenna acts as the source, what will be the received power when the transmission is reversed?

Options :

1. ✓ 1 mW
2. ✗ 2 mW
3. ✗ 0.5 mW

4. ✖ 0.25 mW

Question Number : 129 Question Id : 5069616144 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Find the characteristic impedance (Z_0) of a loss less transmission line with the following parameters: Inductance per unit length: $L = 0.25 \mu\text{H/m}$, Capacitance per unit length: $C = 100 \text{ pF/m}$.

Options :

1. ✖ 100 Ω

2. ✔ 50 Ω

3. ✖ 25 Ω

4. ✖ 200 Ω

Question Number : 130 Question Id : 5069616145 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A 50 Ω transmission line is terminated with a load impedance of Z_0 and standing wave ratio (SWR) equal to 4. Find the value of Z_0 ?

Options :

1. ✖ 50 Ω

2. ✖ 100 Ω

3. ✔ 200 Ω

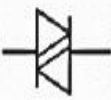
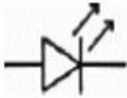
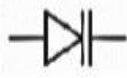
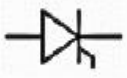
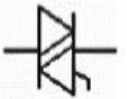
4. ✖ 25 Ω

Question Number : 131 Question Id : 5069616146 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Match List I with List II and choose the correct option.

List I		List II	
Symbol		Name of the device	
i.		a.	DIAC
ii.		b.	LED
iii.		c.	VARICAP
iv.		d.	SCR
v.		e.	TRIAC

Options :

1. ✖ i – a, ii – c, iii – b, iv – d, v - e

2. ✖ i – b, ii – e, iii – c, iv – d, v – a

3. ✖ i – c, ii – b, iii – e, iv – d, v – a

4. ✔ i – a, ii – b, iii – c, iv – d, v – e

Question Number : 132 Question Id : 5069616147 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Choose the correct option

- A. Photodiodes and light-dependent resistors are both light-sensitive devices.
- B. Photodiodes are faster and more accurate compared to LDRs
- C. Photo diode converts light energy into electric energy
- D. LDR changes resistance based on light intensity

Options :

- 1.  A, B, C and D are true
- 2.  Only A and B are true
- 3.  Only C and D are true
- 4.  Only A, B and C are true

Question Number : 133 Question Id : 5069616148 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Given below is a list of transducers. Identify the active transducers.

- A. LVDT (Linear Variable Differential Transformer)
- B. RTD (Resistance Temperature Detector)
- C. Thermocouple
- D. Strain gauge

Options :

- 1.  Only A is correct
- 2.  Both A and B are correct
- 3.  Only C is correct
- 4.  Both A and D are correct

Question Number : 134 Question Id : 5069616149 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

In one of the types of electric welding, _____ is used to generate intense heat and melt metals together, often requiring filler material.

Options :

1. ✓ Electric arc
2. ✗ Resistance
3. ✗ Friction
4. ✗ Induction heating

Question Number : 135 Question Id : 5069616150 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Types of resistive welding includes _____.

Options :

1. ✓ Spot welding, seam welding, and projection welding
2. ✗ MIG welding (Metal Inert Gas welding)
3. ✗ TIG welding (Tungsten Inert Gas welding)
4. ✗ Arc welding

Question Number : 136 Question Id : 5069616151 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

What type of programming language is typically used to program a PLC?

Options :

1. ✖ C++
2. ✖ Java
3. ✔ Ladder Logic
4. ✖ Python

Question Number : 137 Question Id : 5069616152 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Given Seebeck coefficient S is $40 \mu\text{V}/^\circ\text{C}$, hot junction temperature is 200°C and cold junction temperature is 25°C , then the thermocouple voltage is

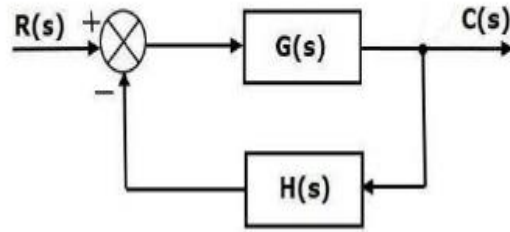
Options :

1. ✖ 1 mV
2. ✖ 3.5 mV
3. ✖ 1.5 mV
4. ✔ 7 mV

Question Number : 138 Question Id : 5069616153 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

What is the overall gain ($C(s)/R(s)$) of the closed loop system given below?



Options :

1. ✖ $\frac{G(s)}{1 - G(s)H(s)}$

2. ✔ $\frac{G(s)}{1 + G(s)H(s)}$

3. ✖ $\frac{H(s)}{1 + G(s)H(s)}$

4. ✖ $\frac{H(s)}{1 - G(s)H(s)}$

Question Number : 139 Question Id : 5069616154 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The range of frequencies used for dielectric heating and induction heating are _____ respectively.

Options :

1. ✔ 10 MHz to 50 MHz and 100 kHz to 500 kHz

2. ✖ 10 MHz to 50 MHz and 100 MHz to 500 MHz

3. ✖ 10 kHz to 50 kHz and 100 kHz to 500 kHz

10 kHz to 50 kHz and 100 MHz to 500 MHz

4. ✖

Question Number : 140 Question Id : 5069616155 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

As a result of introduction of negative feedback in a control system, which of the following will not decrease?

Options :

- 1. ✔ Bandwidth
- 2. ✖ Overall gain
- 3. ✖ Distortion
- 4. ✖ Instability

Question Number : 141 Question Id : 5069616156 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A 400 W carrier is amplitude modulated to a depth of 80%. What is the total transmitted power?

Options :

- 1. ✖ 512 W
- 2. ✔ 528 W
- 3. ✖ 640 W
- 4. ✖ 720 W

Question Number : 142 Question Id : 5069616157 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A superheterodyne receiver has an RF input of 10 MHz and an Intermediate Frequency (IF) of 455 kHz. If image frequency rejection is required, what should be the minimum image frequency?

Options :

1. ✖ 9.09 MHz
2. ✔ 10.91 MHz
3. ✖ 10.455 MHz
4. ✖ 9.545 MHz

Question Number : 143 Question Id : 5069616158 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A radar system transmits a signal at 10 GHz. If the target is moving at 200 m/s, what is the Doppler frequency shift? Assume speed of light to be 3×10^8 m/s.

Options :

1. ✖ 10 kHz
2. ✔ 13.33 kHz
3. ✖ 16.67 kHz
4. ✖ 20 kHz

Question Number : 144 Question Id : 5069616159 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A 10 kHz modulating signal frequency produces a maximum frequency deviation of 50 kHz in an FM signal. What is the modulation index?

Options :

1. ✓ 5
2. ✗ 2
3. ✗ 10
4. ✗ 20

Question Number : 145 Question Id : 5069616160 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In Pulse Code Modulation (PCM), quantization noise is reduced by

Options :

1. ✗ Increasing the sampling rate
2. ✓ Increasing the number of quantization levels
3. ✗ Using larger bandwidth
4. ✗ Using Pulse Amplitude Modulation

Question Number : 146 Question Id : 5069616161 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The threshold electric field required to trigger Gunn oscillations in GaAs is typically around

Options :

1. ✓ 3.2 kV/cm
2. ✗ 1 kV/cm
3. ✗ 10 kV/cm
4. ✗ 100 kV/cm

Question Number : 147 Question Id : 5069616162 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If bandwidth is of primary concern, which one of the following schemes is generally not considered?

Options :

1. ✗ PSK
2. ✗ ASK
3. ✗ DPSK
4. ✓ FSK

Question Number : 148 Question Id : 5069616163 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A rectangular waveguide is 5.1 cm by 2.4 cm (inside measurements). The cutoff frequency of the dominant mode will be nearly

Options :

1. ✖ 5.38 GHz
2. ✖ 4.54 GHz
3. ✖ 3.78 GHz
4. ✔ 2.94 GHz

Question Number : 149 Question Id : 5069616164 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following is a primary advantage of a TWT (Travelling Wave Tube) over a klystron amplifier?

Options :

1. ✖ Higher efficiency
2. ✔ Wider bandwidth
3. ✖ Smaller size and simpler design
4. ✖ Works at low frequencies

Question Number : 150 Question Id : 5069616165 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A Delta Modulation system has a step size of 1V and operates at 10 kHz.
What is the maximum slope it can track?

Options :

1. ✔ 10 V/ms

- 2. ✖ 5 V/ms
- 3. ✖ 1 V/ms
- 4. ✖ 100 V/ms

Question Number : 151 Question Id : 5069616166 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A PCM system samples an analog signal with a maximum frequency of 10 kHz. If each sample is quantized into 256 levels, what is the minimum transmission bit rate?

Options :

- 1. ✖ 10 kbps
- 2. ✖ 20 kbps
- 3. ✖ 80 kbps
- 4. ✔ 160 kbps

Question Number : 152 Question Id : 5069616167 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A magnetron is commonly used in which application?

Options :

- 1. ✔ Radar
- 2. ✖ Optical fiber communication

3. ✖ TV Broadcasting

4. ✖ VHF communications

Question Number : 153 Question Id : 5069616168 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The purpose of pre-emphasis in FM transmission is

Options :

1. ✖ To reduce bandwidth

2. ✖ To suppress noise at low frequencies

3. ✔ To amplify high-frequency components

4. ✖ To avoid phase distortion

Question Number : 154 Question Id : 5069616169 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

A satellite transmits at 6 GHz and receives at 4 GHz. What is the transponder bandwidth if the received signal has a 50 MHz bandwidth?

Options :

1. ✔ 50 MHz

2. ✖ 100 MHz

3. ✖ 500 MHz

4. ✖ 1 GHz

Question Number : 155 Question Id : 5069616170 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

A 1 MHz carrier is amplitude-modulated by a 10 kHz signal. What are the sideband frequencies?

Options :

1. ✓ 990 kHz and 1010 kHz
2. ✗ 900 kHz and 1100 kHz
3. ✗ 995 kHz and 1005 kHz
4. ✗ 500 kHz and 1500 kHz

Question Number : 156 Question Id : 5069616171 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

A microwave semiconductor device is

Options :

1. ✗ Klystron
2. ✓ GUNN Diode
3. ✗ Magnetron
4. ✗ TWT

Question Number : 157 Question Id : 5069616172 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The term in satellite communication refers to the closest point of the satellite's orbit to Earth is

Options :

1. ✓ Perigee
2. ✗ Apogee
3. ✗ Azimuth
4. ✗ Elevation

Question Number : 158 Question Id : 5069616173 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In a TDM system, 4 signals each band limited to 3 kHz are multiplexed. What is the minimum sampling rate per signal?

Options :

1. ✗ 3 kHz
2. ✓ 6 kHz
3. ✗ 12 kHz
4. ✗ 24 kHz

Question Number : 159 Question Id : 5069616174 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In a BPSK system, the phase difference between '0' and '1' is

Options :

1. ✖ 0 degree
2. ✖ 90 degrees
3. ✔ 180 degrees
4. ✖ 270 degrees

Question Number : 160 Question Id : 5069616175 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

The primary purpose of modulation in communication systems is

Options :

1. ✔ To reduce antenna size
2. ✖ To increase signal power
3. ✖ To convert from digital to analog
4. ✖ To remove channel noise

Question Number : 161 Question Id : 5069616176 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

The primary function of a radar duplexer is

Options :

1. ✖ Amplifies received signals
2. ✔ Separates transmitted and received signals
3. ✖

Detects frequency shifts

4. ✖ Reduces noise

Question Number : 162 Question Id : 5069616177 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

A radar transmits pulses at 5 GHz. If the pulse round-trip time is 40 μ s, what is the target distance?

Options :

1. ✖ 3 km

2. ✔ 6 km

3. ✖ 12 km

4. ✖ 24 km

Question Number : 163 Question Id : 5069616178 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

RZ and NRZ refers to

Options :

1. ✖ AM and FM waveforms

2. ✖ Digital multiplexing techniques

3. ✔ Line coding schemes

4. ✖ Pulse shaping filters

Question Number : 164 Question Id : 5069616179 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

For a 16-QAM modulation scheme, how many bits are transmitted per symbol?

Options :

- 1. ✖ 2 bits
- 2. ✖ 3 bits
- 3. ✔ 4 bits
- 4. ✖ 8 bits

Question Number : 165 Question Id : 5069616180 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A 64-QAM system is required to provide a data rate of 24 Mbps. What must the symbol rate be?

Options :

- 1. ✖ 2 Msymbol/s
- 2. ✖ 3 Msymbol/s
- 3. ✔ 4 Msymbol/s
- 4. ✖ 6 Msymbol/s

Question Number : 166 Question Id : 5069616181 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

What is the equivalent Gray code for the binary code $(1100\ 1010)_2$?

Options :

1. ✖ 11110111
2. ✖ 10101110
3. ✖ 11101111
4. ✔ 10101111

Question Number : 167 Question Id : 5069616182 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A bulb in a staircase has two switches, one switch is on the ground floor and the other one on the first floor. The bulb can be turned ON and also can be turned OFF by any one of the switches irrespective of the state of the other switch. The logic of switching of the bulb resembles

Options :

1. ✖ An OR gate
2. ✔ An XOR gate
3. ✖ An AND gate
4. ✖ A NAND gate

Question Number : 168 Question Id : 5069616183 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The Boolean expression $A + \overline{A}B$ is same as

Options :

1. ✔ $A + B$

2. ✖ $\overline{A} + B$

3. ✖ AB

4. ✖ $A\overline{B}$

Question Number : 169 Question Id : 5069616184 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Which logic families among the following are the fastest and slowest respectively.

A. CMOS B. ECL C. DTL D. TTL

Options :

1. ✖ A and B respectively

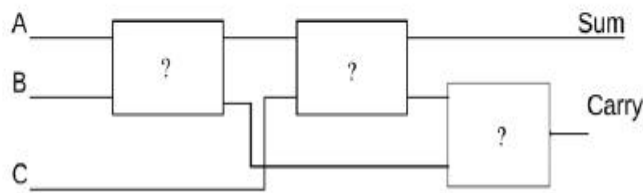
2. ✖ C and B respectively

3. ✖ D and A respectively

4. ✔ B and A respectively

Question Number : 170 Question Id : 5069616185 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

A full adder can be implemented by using the blocks indicated with question marks. They are:



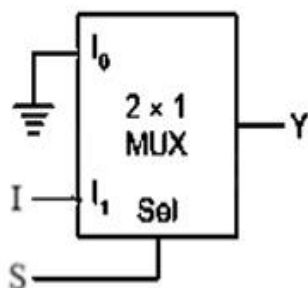
Options :

1. ✓ Two Half adders and an OR gate
2. ✗ Two Half adders and an AND gate
3. ✗ Two Half subtractors and an OR gate
4. ✗ Two Half subtractors and an AND gate

Question Number : 171 Question Id : 5069616186 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

What is the Boolean function Y from the multiplexer shown below?



Options :

1. ✓ SI
2. ✗ $\bar{S}I$
3. ✗

$\bar{S} \bar{I}$

4. ✖ $S \bar{I}$

Question Number : 172 Question Id : 5069616187 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A/An _____ is a _____ circuit that converts coded inputs into coded outputs, where the input and output codes are different.

Options :

1. ✖ Encoder, sequential

2. ✔ Decoder, combinational

3. ✖ Decoder, sequential

4. ✖ Counter, combinational

Question Number : 173 Question Id : 5069616188 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Choose the correct characteristic equation of a JK flip-flop.

Options :

1. ✖ $Q_{n+1} = J'Q_n' + K'Q_n$

2. ✖ $Q_{n+1} = JQ_n' + KQ_n$

3. ✔ $Q_{n+1} = JQ_n' + K'Q_n$

4. ✖ $Q_{n+1} = J'Q_n' + KQ_n$

Question Number : 174 Question Id : 5069616189 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Universal shift register is capable of doing which of the following functions?

- A. Shift Left (L) B. Shift Right (R)
- C. No change (Hold) D. Parallel Load (Load)

Options :

1. ✖ A and B only

2. ✖ C and D only

3. ✖ A and C only

4. ✔ A, B, C and D

Question Number : 175 Question Id : 5069616190 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The largest binary number that can be represented by a 16-bit counter has a decimal equivalent of _____.

Options :

1. ✖ 65536

2. ✖ 16

3. ✖ 15

4. ✔ 65535

Question Number : 176 Question Id : 5069616191 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

SRAM cell consists of ____, whereas a DRAM cell is made up of ____.

Options :

1. ✖ multiple transistors; multiple capacitors

2. ✔ multiple transistors; single transistor and a capacitor

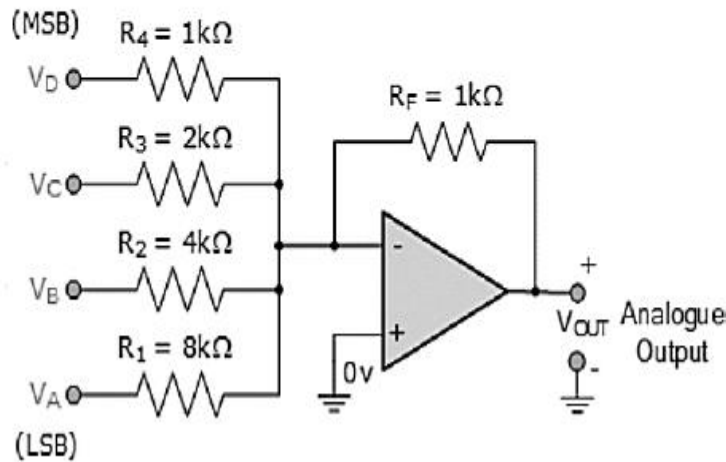
3. ✖ single transistor; single transistor and a capacitor

4. ✖ single transistor and a capacitor; multiple transistors

Question Number : 177 Question Id : 5069616192 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Given below is a 4-bit weighted resistor DAC, the output analog voltage for digital input “1000” is _____. (Assume voltage (V_D , V_C , V_B , V_A) of +5V for ‘1’ and 0V for ‘0’)



Options :

1. ✗ -1 V
2. ✗ +1 V
3. ✗ +5 V
4. ✓ -5 V

Question Number : 178 Question Id : 5069616193 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Select the correct option from the features of 8051 microcontroller with respect to the on-chip ROM, RAM, Timers and I/O ports respectively

Options :

1. ✓ 4 KB of on chip ROM
2. ✗ 3 I/O ports
3. ✗

4 Timers

512 bytes of RAM

4. ✖

Question Number : 179 Question Id : 5069616194 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If the crystal connected to an 8051 microcontroller is of 10 MHz, the length of its machine cycle will be

Options :

1.2 microseconds

1. ✔

1.4 microseconds

2. ✖

1.0 microseconds

3. ✖

1.6 microseconds

4. ✖

Question Number : 180 Question Id : 5069616195 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The default interrupt priority in 8051 is

Options :

$INT0 > TF0 > RI + TI > INT1 > TF1$

1. ✖

$INT1 > TF1 > RI + TI > INT0 > TF0$

2. ✖

$INT0 > TF0 > INT1 > TF1 > RI + TI$

3. ✔

4. ✖ INT1 > TF1 > INT0 > TF0 > RI + TI

Question Number : 181 Question Id : 5069616196 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

After executing the following instructions, the status of the carry flag (CY), auxiliary carry flag (AC) and parity flag (P) is

```
MOV A, #9CH
ADD A, #64H
```

Options :

1. ✖ CY=0, AC=0, P=0

2. ✔ CY=1, AC=1, P=0

3. ✖ CY=0, AC=1, P=0

4. ✖ CY=1, AC=1, P=1

Question Number : 182 Question Id : 5069616197 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

How many times the instruction CPL A is executed in the following program of an 8051?

```
MOV A, #F0H
MOV R1, #60
NEXT: MOV R6, #10H
AGAIN: CPL A
      DJNZ R6, AGAIN
      DJNZ R1, NEXT
```

Options :

1. ✖ 600 times
2. ✖ 900 times
3. ✖ 690 times
4. ✔ 960 times

Question Number : 183 Question Id : 5069616198 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In 8257, the pin that is used to write data to the addressed memory location, during DMA write operation is

Options :

1. ✖ AEN
2. ✖ $\overline{MEMR}$
3. ✔ $\overline{MEMW}$
4. ✖ $\overline{IOW}$

Question Number : 184 Question Id : 5069616199 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which port of the 8255 PPI is capable of performing the handshaking function with the interfaced devices?

Options :

1. ✖ Port A

2. ✖ Port B

3. ✔ Port C

4. ✖ IO Port

Question Number : 185 Question Id : 5069616200 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In 8251A, the pin that controls the rate at which the character is to be transmitted is

Options :

1. ✖ CLK

2. ✖ $\overline{R \times C}$

3. ✔ $\overline{T \times C}$

4. ✖ $T \times E$

Question Number : 186 Question Id : 5069616201 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The command for turning off the display and turning off the cursor in a 16*2 LCD display is

Options :

1. ✖ 0CH

2. ✔ 08H

3. ✖ 0EH

4. ✖ 8DH

Question Number : 187 Question Id : 5069616202 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Aspect ratio can be defined as the ratio of width to height of the picture frame.
For television, it is standardized as _____.

Options :

1. ✔ 4:3

2. ✖ 3:4

3. ✖ 3:5

4. ✖ 5:3

Question Number : 188 Question Id : 5069616203 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Composite video signal consists of

A. camera signal

B. blanking pulses

C. synchronizing pulse

D. camera signal and blanking pulses

Options :

1. ✖ Only A

2. ✖ Only B

3. ✓ Both C and D

4. ✗ D only

Question Number : 189 Question Id : 5069616204 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

NTSC is one of the various TV broadcasting standards. It stands for

Options :

1. ✗ National Television Standard Committee

2. ✓ National Television System Committee

3. ✗ National Television System Consortium

4. ✗ National Telescope Standard Committee

Question Number : 190 Question Id : 5069616205 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Various steps in DTH system are given below. Choose the correct sequence:

- A. Uplink center receives TV programs from content providers
- B. Signal is compressed, encrypted, and sent to a geostationary satellite.
- C. Satellite amplifies and retransmits the signal back to Earth.
- D. Dish antenna at the consumer's home receives the signal and sends to Set-Top Box (STB).
- E. STB decrypts, decompresses, and converts the signal into TV channels.

Options :

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

Question Number : 191 Question Id : 5069616206 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Phase Alternating Line (PAL) is a colour encoding system for analog TV. It's picture is made up of _____ interlaced lines, displayed at a rate of _____ frames per second in most countries.

Options :

- 1. ✔ 625, 25
- 2. ✖ 25, 625
- 3. ✖ 5, 25

4. ✖ 25, 125

Question Number : 192 Question Id : 5069616207 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Comparing HDTV and Smart TV, select the correct option.

- A. A high-definition television supports HD resolutions like 720p, 1080p, or 4K.
- B. Smart TV has built-in internet connectivity, apps for streaming, browsing, etc.
- C. A HDTV must and should support Wi-Fi, an operating system and ethernet
- D. HDTV mandatorily requires external devices like Firestick, Chromecast, set-top box for normal TV functionality

Options :

1. ✔ Both A and B

2. ✖ Both A and C

3. ✖ Both A and D

4. ✖ Both C and B

Question Number : 193 Question Id : 5069616208 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

_____ network type covers multiple locations spanning over a large geographic area.

Options :

1. ✘ LAN
2. ✔ WAN
3. ✘ MAN
4. ✘ PAN

Question Number : 194 Question Id : 5069616209 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Which of the following network topologies are widely used?

- A) Bus
- B) Lan
- C) Mesh
- D) Pan
- E) Tree

Options :

1. ✘ A, B, C
2. ✘ A, B, D
3. ✘ B, D
4. ✔ A, C, E

Question Number : 195 Question Id : 5069616210 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

In wired transmission, _____ are the widely used physical media.

Options :

1. ✖ Infrared, Twisted Pair, Coaxial Cable
2. ✖ Copper Wires, High frequency Radio, Coaxial Cable
3. ✔ Copper Wires, Optical Fiber, Coaxial Cable
4. ✖ Infrared, Laser, Coaxial Cable

Question Number : 196 Question Id : 5069616211 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

_____ and _____ are the two types of data switching techniques employed in network services.

Options :

1. ✔ Circuit, Packet
2. ✖ Transport, Network
3. ✖ Data Link, Session
4. ✖ Application, Presentation

Question Number : 197 Question Id : 5069616212 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

_____ and _____ are used as LAN components and Internetwork connecting devices respectively.

Options :

1. ✖ Hub, Repeater, Router and Gateway, bridge
2. ✔ Hub, Repeater, Bridge and Router, Gateway
3. ✖ Hub, Switch, Router and Repeater, Gateway
4. ✖ Hub, Switch, Gateway and bridge, router

Question Number : 198 Question Id : 5069616213 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The FTP (File Transfer Protocol) uses _____ port numbers.

Options :

1. ✖ 80 and 443
2. ✖ 23 and 24
3. ✖ 25 and 26
4. ✔ 20 and 21

Question Number : 199 Question Id : 5069616214 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The channel capacity (C) of a communication channel is defined as

Options :

1. ✖ The maximum amount of data that can be transmitted through the channel

2. ✓ The maximum amount of data rate supported by a channel
3. ✗ The minimum amount of data that can be transmitted through the channel
4. ✗ The minimum amount of data rate supported by a channel

Question Number : 200 Question Id : 5069616215 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Bluetooth technology is also known as _____

Options :

1. ✗ Wired LAN
2. ✗ Wired PAN
3. ✓ Wireless PAN
4. ✗ Wireless LAN