

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 INSTRUMENTATION
ENGINEERING 12th May 2025 Shift1

Subject Name :

Electronics and Instrumentation
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 INSTRUMENTATION ENGINEERING

Group Number :

1

Group Id :

50696132

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 :

506961122

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 :	506961143
Question Shuffling Allowed :	Yes

Question Number : 1 Question Id : 5069616216 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 : 5069616217 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 : 5069616218 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 $x + y + z = 6$,

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

Options :

1. ✗ $\frac{1}{6}$

2. ✗ $\frac{3}{2}$

3. ✓ 6

4. ✗ 3

Question Number : 4 Question Id : 5069616219 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 : 5069616220 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 : 5069616221 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 : 5069616222 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 : 5069616223 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

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

Options :

1. ✓ -1

2. ✖ 2

3. ✖ -2

4. ✖ 1

Question Number : 9 Question Id : 5069616224 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 : 5069616225 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 : 5069616226 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 : 5069616227 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 : 5069616228 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 : 5069616229 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 : 5069616230 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. ✗

Question Number : 16 Question Id : 5069616231 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 : 5069616232 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 : 5069616233 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 : 5069616234 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 : 5069616235 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 : 5069616236 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 : 5069616237 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 : 5069616238 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 : 5069616239 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 : 5069616240 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 : 5069616241 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 : 5069616242 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 : 5069616243 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 : 5069616244 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 : 5069616245 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 : 5069616246 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 : 5069616247 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 : 5069616248 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 : 5069616249 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 : 5069616250 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 : 5069616251 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 : 5069616252 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 : 5069616253 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 : 5069616254 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 : 5069616255 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 : 5069616256 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 : 5069616257 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 : 5069616258 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 : 5069616259 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 : 5069616260 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 : 5069616261 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 : 5069616262 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 : 5069616263 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 : 5069616264 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 : 5069616265 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 :	506961123
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 :	506961144
Question Shuffling Allowed :	Yes

Question Number : 51 Question Id : 5069616266 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)

4. ✖ v is proportional to $(\rho\lambda g)$

Question Number : 52 Question Id : 5069616267 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 : 5069616268 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 : 5069616269 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 : 5069616270 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 : 5069616271 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 : 5069616272 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 : 5069616273 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 : 5069616274 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 : 5069616275 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 : 5069616276 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 : 5069616277 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 : 5069616278 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 : 5069616279 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 : 5069616280 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 : 5069616281 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 : 5069616282 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 : 5069616283 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 : 5069616284 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 : 5069616285 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 : 5069616286 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. ✖ $h^*\nu$
2. ✖ $h^*\nu_0$
3. ✔ $h^*(\nu - \nu_0)$
4. ✖ $h^*(\nu + \nu_0)$

Question Number : 72 Question Id : 5069616287 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 : 5069616288 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 : 5069616289 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 : 5069616290 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 :	506961124
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 :	506961145
Question Shuffling Allowed :	Yes

Question Number : 76 Question Id : 5069616291 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 : 5069616292 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.

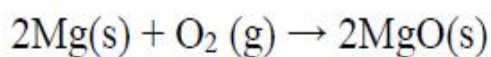
Options :

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 : 5069616293 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 : 5069616294 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 : 5069616295 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

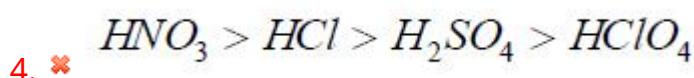
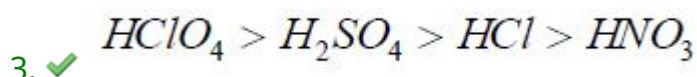
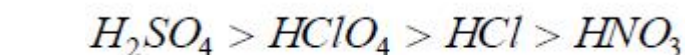
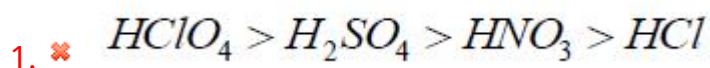
4. ✖ Diffuse slowly

Question Number : 81 Question Id : 5069616296 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 : 5069616297 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 : 5069616298 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 : 5069616299 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 : 5069616300 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 : 5069616301 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 : 5069616302 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 : 5069616303 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 : 5069616304 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 : 5069616305 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 : 5069616306 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 : 5069616307 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 : 5069616308 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 : 5069616309 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 : 5069616310 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 : 5069616311 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 : 5069616312 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

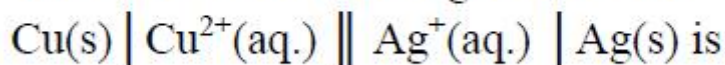
4. ✔ a – iv, b – v, c – ii, d – iii

Question Number : 98 Question Id : 5069616313 Question Type : MCQ Option Shuffling : Yes

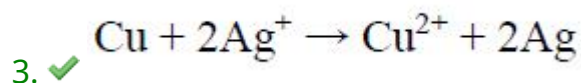
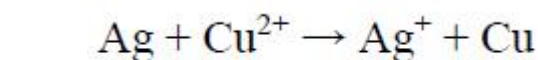
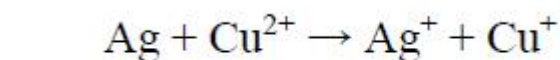
Display Question Number : Yes

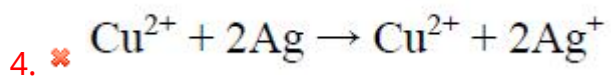
Correct Marks : 1 Wrong Marks : 0

The cell reaction of the galvanic cell



Options :





Question Number : 99 Question Id : 5069616314 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 : 5069616315 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 INSTRUMENTATION ENGINEERING

Section Id :	506961125
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 :	506961146
Question Shuffling Allowed :	Yes

Question Number : 101 Question Id : 5069616316 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

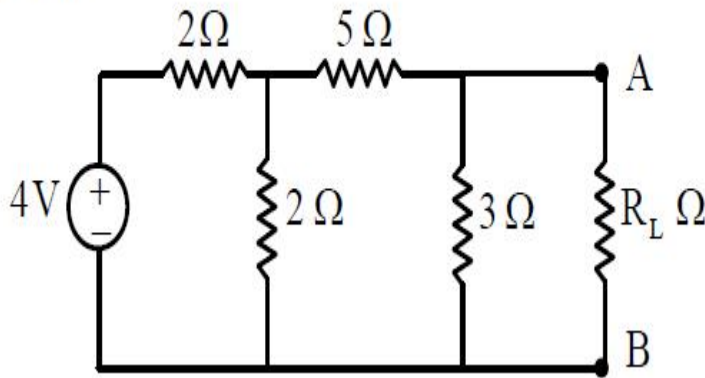
Front end of a radio receiver circuit consists of a series RLC resonant circuit which is tuned to a resonant frequency of 720 kHz with a bandwidth of 20 kHz. Find the Q-factor of the same.

Options :

1. ✖ 72
2. ✖ 144
3. ✔ 36
4. ✖ 20

Question Number : 102 Question Id : 5069616317 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

What should be the value of R_L such that maximum power will be transferred to load in the following circuit



Options :

- 1. ✖ $R_L = 6\Omega$
- 2. ✖ $R_L = 5\Omega$
- 3. ✔ $R_L = 2\Omega$
- 4. ✖ $R_L = 1\Omega$

Question Number : 103 Question Id : 5069616318 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

A current source with a value of 5 mA in parallel with a resistor of 1 k Ω can be equivalently replaced with

Options :

- 1. ✔ A Voltage source with a value of 5 V in series with a 1 k Ω resistor
- 2. ✖ A Voltage source with a value of 5 V in parallel with a 1 k Ω resistor
- 3. ✖ A Voltage source with a value of 10 V in parallel with a 5 k Ω resistor
- 4. ✖ A Voltage source with a value of 10 V in series with a 5 k Ω resistor

Question Number : 104 Question Id : 5069616319 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A Lap wound D.C machines has 4 poles and the flux per pole is 0.07 Webers, total number of conductors in the armature are 440. The machine rotates at a speed of 900rpm. Calculate the induced e.m.f in the generator.

Options :

- 1. ✖ 440 V
- 2. ✔ 462 V
- 3. ✖ 500 V
- 4. ✖ 512 V

Question Number : 105 Question Id : 5069616320 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following statements is true about Kirchhoff's Voltage Law?

Options :

- 1. ✖ The sum of currents at a node is always zero
- 2. ✔ The sum of voltage drops around a closed loop is zero
- 3. ✖ Voltage sources in series must have the same polarity
- 4. ✖ The resistance of a circuit is independent of voltage

Question Number : 106 Question Id : 5069616321 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The efficiency of a transformer is maximum for a power factor of

Options :

- 1. ✖ 0
- 2. ✖ 0.5
- 3. ✖ 0.75
- 4. ✔ 1

Question Number : 107 Question Id : 5069616322 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Four equal value of capacitors ($20\ \mu\text{F}$) are connected in parallel then what will be its equivalent capacitance value

Options :

- 1. ✖ $5\ \mu\text{F}$
- 2. ✔ $80\ \mu\text{F}$
- 3. ✖ $20\ \mu\text{F}$
- 4. ✖ $30\ \mu\text{F}$

Question Number : 108 Question Id : 5069616323 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In AC machine circuits, the purpose of static frequency changes is for

Options :

1. ✓ Speed control of the motor
2. ✗ Improvement of power factor
3. ✗ Cooling improvement
4. ✗ To reverse the direction of rotation

Question Number : 109 Question Id : 5069616324 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Forbidden energy gap at 0°K for Ge is _____

Options :

1. ✗ 0.32 eV
2. ✗ 0.65 eV
3. ✓ 0.78 eV
4. ✗ 1.21 eV

Question Number : 110 Question Id : 5069616325 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Avalanche breakdown primarily depends on the phenomenon of _____

Options :

1. ✗

doping

2. ✓ collision

3. ✗ recombination

4. ✗ ionization

Question Number : 111 Question Id : 5069616326 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The impurity concentration in tunnel diode is 1 part in _____

Options :

1. ✗ 100 parts

2. ✓ 1000 parts

3. ✗ 10000 parts

4. ✗ 1 million parts

Question Number : 112 Question Id : 5069616327 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following are the effects of increasing the reverse bias voltage across a PN junction?

- A. Increase in carrier generation current.
- B. Decrease in junction capacitance of the diode
- C. Increase in carrier recombination in the depletion layer

Options :

1. ✖ A and B

2. ✖ A only

3. ✖ B and C

4. ✔ B only

Question Number : 113 Question Id : 5069616328 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Which of the following diode is not operated in reverse bias mode?

Options :

1. ✖ Zener Diode

2. ✖ Varactor Diode

3. ✔ Tunnel Diode

4. ✖ Photo Diode

Question Number : 114 Question Id : 5069616329 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The arrow on the emitter of NPN and PNP transistors shows the directions of flow of _____ and _____ respectively.

Options :

1. ✔ holes, holes

2. ✖

holes, electrons

3. ✖ electrons, holes

4. ✖ electrons, electrons

Question Number : 115 Question Id : 5069616330 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A small increase in collector reverse bias will cause _____

Options :

1. ✖ a large increase in collector current

2. ✖ a large increase in emitter current

3. ✖ a large decrease in collector current

4. ✔ a very small change in collector reverse saturation current

Question Number : 116 Question Id : 5069616331 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A cascade amplifier will have higher cut-off frequency which is _____

Options :

1. ✔ lower than single stage amplifier

2. ✖ same as that of single stage amplifier

3. ✖ higher than single stage amplifier

4. ✖ double than single stage amplifier

Question Number : 117 Question Id : 5069616332 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following will not decrease with negative feedback ?

Options :

1. ✖ Distortion

2. ✔ Bandwidth

3. ✖ Instability

4. ✖ Overall gain

Question Number : 118 Question Id : 5069616333 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A Colpitts oscillator uses _____

Options :

1. ✖ no tapped inductor or capacitor

2. ✖ a tapped inductor

3. ✔ a tapped capacitor

4. ✖ both tapped inductor and capacitor

Question Number : 119 Question Id : 5069616334 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

High power efficiency of the push-pull amplifier is due to the fact that _____

Options :

1. ✖ each transistor conducts on different cycles of the input
2. ✖ transistors are placed in CE configuration
3. ✖ low forward biasing voltage is required
4. ✔ there is no quiescent collector current

Question Number : 120 Question Id : 5069616335 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following components control the high frequency response of the R-C coupled amplifier? Select the correct option

- A. Parasitic capacitances of the transistors
- B. Coupling capacitance
- C. Stray capacitances
- D. Wiring capacitance

Options :

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

Question Number : 121 Question Id : 5069616336 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Simplify the following Boolean function T_1 and T_2 into minimum number of literals

A	B	C	T_1	T_2
0	0	0	1	0
0	0	1	1	0
0	1	0	1	0
0	1	1	0	1
1	0	0	0	1
1	0	1	0	1
1	1	0	0	1
1	1	1	0	1

Options :

1. ✓ $T_1 = \overline{A}(\overline{B} + \overline{C}); T_2 = A + BC$

2. ✗ $T_1 = A(B + C); T_2 = \overline{A} + \overline{B} \overline{C}$

3. ✗ $T_1 = A(\overline{B} + \overline{C}); T_2 = \overline{A} + BC$

4. ✗ $T_1 = A(B + \overline{C}); T_2 = \overline{A} + \overline{B}C$

Question Number : 122 Question Id : 5069616337 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following logic is fastest family

Options :

1. ✗ TTL

2. ✖ CMOS

3. ✖ RTL

4. ✔ ECL

Question Number : 123 Question Id : 5069616338 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Find the 16's complement of the following number $(C3DF)_{16}$

Options :

1. ✔ $(3C21)_{16}$

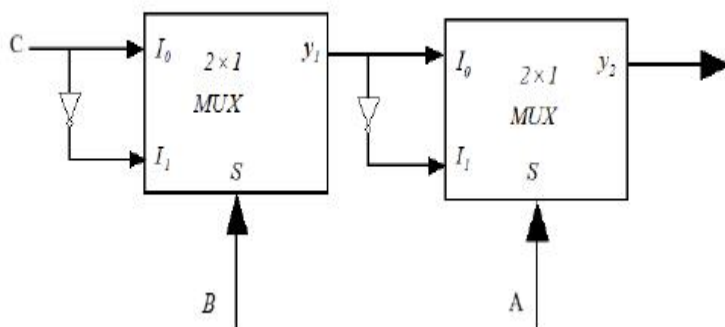
2. ✖ $(3C20)_{16}$

3. ✖ $(C3DF)_{16}$

4. ✖ $(C3DE)_{16}$

Question Number : 124 Question Id : 5069616339 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The logic Boolean equation implemented by the following diagram is



Options :

1. ✓ $\overline{A}\overline{B}C + \overline{A}B\overline{C} + A\overline{B}\overline{C} + ABC$

2. ✗ $\overline{A}BC + A\overline{B}C + AB\overline{C} + ABC$

3. ✗ $BC + AC + AB$

4. ✗ $ABC + \overline{A}\overline{B} + AB\overline{C} + AB$

Question Number : 125 Question Id : 5069616340 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If two mod-8 synchronous counters are cascaded then determine the output frequency if the input clock frequency is 128 M Hz

Options :

1. ✗ 128 M Hz

2. ✗ 64 M Hz

3. ✗ 16 M Hz

4. ✓ 2 M Hz

Question Number : 126 Question Id : 5069616341 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The range of positive and negative numbers that can be represented using a 7 bit 2's complement representation.

Options :

1. ✗ -128 to 127

2. ✓ -64 to 63

3. ✗ -63 to 63

4. ✗ -127 to 127

Question Number : 127 Question Id : 5069616342 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

For a JK flip flop it is required to force the output value to either logic '1' or logic '0' irrespective of the synchronized clock pulse, the type of input is

Options :

1. ✗ The inputs J and K

2. ✓ The inputs Preset and clear

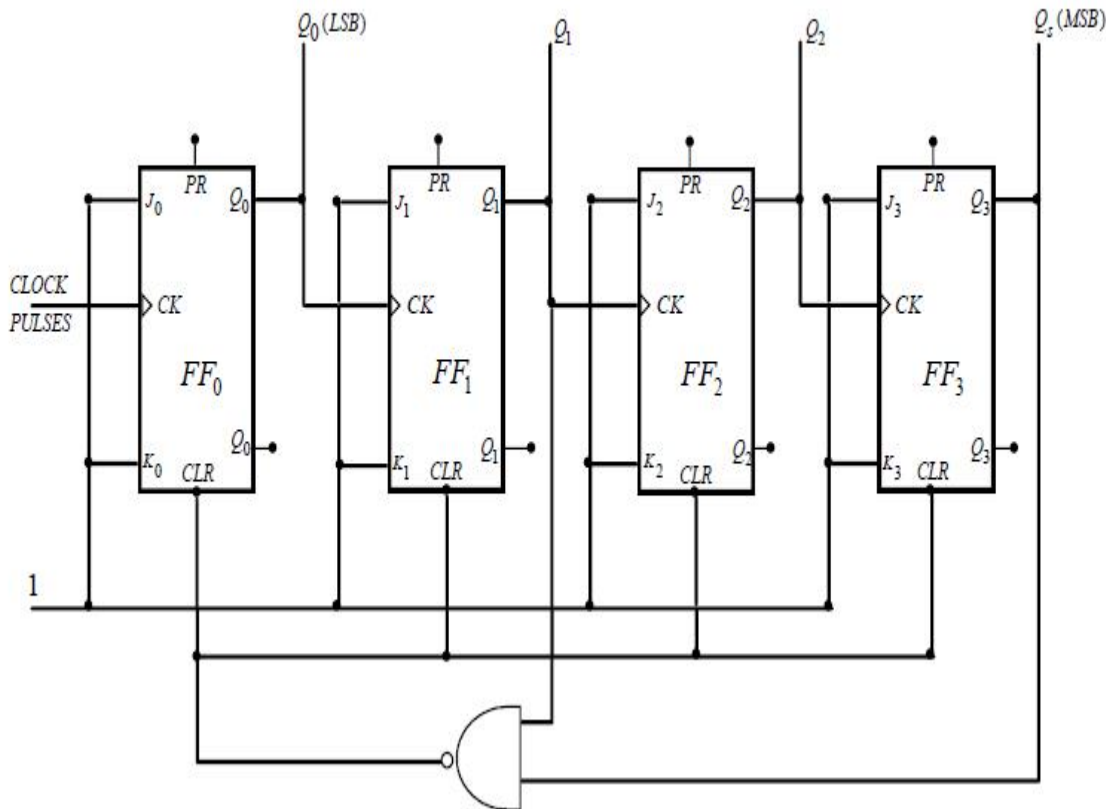
3. ✗ The clock pulse

4. ✗ The inputs J, K and clock pulse

Question Number : 128 Question Id : 5069616343 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Identify the following digital sequential circuit



Options :

1. ✖ Mod-16 ripple counter
2. ✔ Mod-10 ripple counter
3. ✖ 4 bit synchronous counter
4. ✖ 4 bit shift register

Question Number : 129 Question Id : 5069616344 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The race around configuration will occur in which of the following flip flops

Options :

1. ✖ JK flip flop with edge triggered clock pulse

2. ✓ JK flip flop with level triggered clock pulse
3. ✗ Master slave JK flip flop with level triggering clock pulse
4. ✗ Master slave JK flip flop with edge triggering clock pulse

Question Number : 130 Question Id : 5069616345 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

How many 3×8 decoders are required to construct a 4×16 decoder

Options :

1. ✗ 1
2. ✗ 4
3. ✓ 2
4. ✗ 8

Question Number : 131 Question Id : 5069616346 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following best defines accuracy in an instrument?

Options :

1. ✗ The smallest change an instrument can detect
2. ✓ The closeness of measured value to the true value
3. ✗ The repeatability of a measurement

4. ✖ The variation in output with the same input

Question Number : 132 Question Id : 5069616347 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

While measuring boiling water at 100°C , a thermometer reads 98.2°C , 98.3°C and 98.1°C . The thermometer has _____

Options :

1. ✖ High accuracy, low precision

2. ✔ Low accuracy, high precision

3. ✖ High accuracy, high precision

4. ✖ Low accuracy, low precision

Question Number : 133 Question Id : 5069616348 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Inductive sensors work on the principle of _____

Options :

1. ✖ Change in capacitance due to displacement

2. ✖ Change in resistance of a material

3. ✖ Optical signal reflection

4. ✔ Variation in self-inductance or mutual inductance

Question Number : 134 Question Id : 5069616349 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In an LVDT, the output voltage is proportional to _____

Options :

1. ✖ the square of displacement
2. ✖ the temperature of the core
3. ✔ the displacement from the centre position
4. ✖ the frequency of the ac signal

Question Number : 135 Question Id : 5069616350 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Moving iron instruments can measure _____

Options :

1. ✖ Only AC
2. ✖ Only DC
3. ✔ Both AC and DC
4. ✖ Neither AC nor DC

Question Number : 136 Question Id : 5069616351 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A DC tacho generator typically consists of.

Options :

1. ✓ A permanent magnet and a commutator
2. ✗ A rotor, stator and slip rings
3. ✗ A transformer and a rectifier
4. ✗ A capacitor and an inductor

Question Number : 137 Question Id : 5069616352 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The output signal of a photoelectric tachometer is generally_____

Options :

1. ✗ DC voltage
2. ✗ sinusoidal AC voltage
3. ✓ series of pulses
4. ✗ constant current

Question Number : 138 Question Id : 5069616353 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following is NOT an elastic pressure sensing element?

Options :

1. ✗

Bourdon tube

- 2. ✖ Diaphragm
- 3. ✖ Bellows
- 4. ✔ Strain gauge

Question Number : 139 Question Id : 5069616354 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

What happens to capacitance when the diaphragm moves closer to the fixed plate due to applied pressure?

Options :

- 1. ✔ Increases
- 2. ✖ Decreases
- 3. ✖ Remains the same
- 4. ✖ Becomes zero

Question Number : 140 Question Id : 5069616355 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

A thermal mass flow meter calculates flow based on _____

Options :

- 1. ✖ Change in magnetic field
- 2. ✖ Pressure difference

3. ✓ Heat transfer from a heated element

4. ✗ Density variations

Question Number : 141 Question Id : 5069616356 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Why is a pH sensor crucial in the pulping process of a paper manufacturing plant?

Options :

1. ✓ It prevents excessive use of chlorine in bleaching

2. ✗ It ensures that the pulp does not become too dry

3. ✗ It helps control the temperature of the digesters

4. ✗ It prevents the formation of bubbles in the paper

Question Number : 142 Question Id : 5069616357 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which motion detection technology is most suitable for detecting movement behind obstacles?

Options :

1. ✗ Passive Infrared (PIR) sensor

2. ✗ Ultrasonic sensor

3. ✓ Microwave radar sensor

4. ✖ Accelerometer sensor

Question Number : 143 Question Id : 5069616358 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Why is an ionization chamber preferred over a Geiger-Muller counter for measuring high radiation doses?

Options :

- 1. ✔ It provides a continuous current output proportional to radiation intensity
- 2. ✖ It has a faster response time than a GM counter
- 3. ✖ It can only measure low-energy radiation
- 4. ✖ It does not require an external power source

Question Number : 144 Question Id : 5069616359 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

What is the primary working principle of ultrasonic density measurement?

Options :

- 1. ✖ Variation in capacitance with fluid density
- 2. ✔ Change in velocity of sound waves traveling through the fluid
- 3. ✖ Optical refraction properties of the fluid

4. ✖ Induced electromagnetic field changes

Question Number : 145 Question Id : 5069616360 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

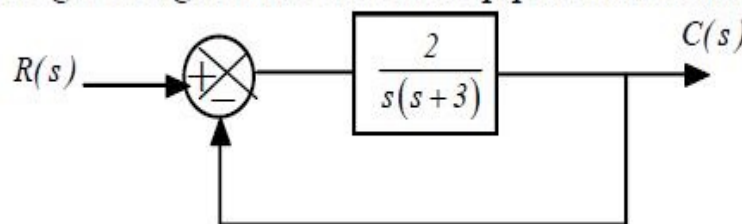
_____ is a fluid dynamic type viscometer.

Options :

- 1. ✖ Redwood viscometer
- 2. ✖ Rotational viscometer
- 3. ✖ Saybolt viscometer
- 4. ✔ Orifice-type viscometer

Question Number : 146 Question Id : 5069616361 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

For the system of the given figure, the closed loop poles are located at



Options :

- 1. ✖ $s = 1$ and $s = 2$
- 2. ✖ $s = -2$ and $s = -3$
- 3. ✔ $s = -1$ and $s = -2$

4. ✖ $s = 2$ and $s = 3$

Question Number : 147 Question Id : 5069616362 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If the gain margin of a closed loop control system is positive then the system is

Options :

1. ✔ Stable

2. ✖ Unstable

3. ✖ Marginally stable

4. ✖ We cannot say from the given data

Question Number : 148 Question Id : 5069616363 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following represents the basic PD controller transfer function

Options :

1. ✔ $K_0 + K_1 s$

2. ✖ $K_0 + \frac{K_1}{s}$

3. ✖ $K_0 + \frac{K_1}{s} + K_2 s$

4. ✖ K_0

Question Number : 149 Question Id : 5069616364 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

In general the lag network represents the filtering action as

Options :

1. ✓ Low pass filter
2. ✗ High pass filter
3. ✗ Band pass filter
4. ✗ Notch filter

Question Number : 150 Question Id : 5069616365 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Which of the following actuator uses fluid pressure to generate motion

Options :

1. ✗ Pneumatic
2. ✗ Electro-Pneumatic
3. ✗ Electrical actuator
4. ✓ Hydraulic actuator

Question Number : 151 Question Id : 5069616366 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A control valve that has the rotating disc that controls the flow of fluid or gas is

Options :

- 1. ✖ Ball valve
- 2. ✖ Globe valve
- 3. ✖ Stem control valve
- 4. ✔ Butterfly valve

Question Number : 152 Question Id : 5069616367 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Calculate the step angle of a stepper motor for number of stator phases 4 and number of rotor teeth 10

Options :

- 1. ✖ 360°
- 2. ✖ 90°
- 3. ✖ 10°
- 4. ✔ 9°

Question Number : 153 Question Id : 5069616368 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The industrial controller having the best steady state accuracy is

Options :

1. ✓ Integral controller
2. ✗ Derivative controller
3. ✗ Proportional controller
4. ✗ Rate feedback controller

Question Number : 154 Question Id : 5069616369 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

Cascade controller consists of

Options :

1. ✗ Primary controller
2. ✗ Secondary controller
3. ✓ Both primary and secondary controllers
4. ✗ Ratio controller

Question Number : 155 Question Id : 5069616370 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

A method where a controller automatically adjusts its parameters in real-time based on feedback from the process, allowing it to maintain optimal performance even when the system dynamics change or disturbances occur is known as

Options :

1. ✗ Static control

- 2. ✓ Adaptive control
- 3. ✗ Open loop control
- 4. ✗ Pseudo control

Question Number : 156 Question Id : 5069616371 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

A Butterworth filter provides _____

Options :

- 1. ✓ maximally flat frequency response
- 2. ✗ sharp cut-off
- 3. ✗ oscillatory behaviour
- 4. ✗ maximum attenuation

Question Number : 157 Question Id : 5069616372 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

In a non-inverting amplifier, if $R_f = 20\text{ K}\Omega$ and $R_{in} = 5\text{ K}\Omega$, the voltage gain is _____

Options :

- 1. ✗ 4
- 2. ✓ 5
- 3. ✗

0.25

4. ✖ 1.25

Question Number : 158 Question Id : 5069616373 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Slew rate in an op-amp affects _____

Options :

- 1. ✖ output impedance
- 2. ✖ common mode rejection ratio
- 3. ✔ maximum frequency response
- 4. ✖ bias current

Question Number : 159 Question Id : 5069616374 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Consider the following statements.

From a sine wave one can obtain square wave by using

- A. Schmitt trigger circuit
- B. Zero crossing detector
- C. clippers and amplifiers

Options :

- 1. ✖ A and B are correct
- 2. ✖ A and C are correct
- 3. ✖ B and C are correct

4. ✓ A, B and C are correct

Question Number : 160 Question Id : 5069616375 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A successive approximation ADC requires how many clock cycles for an 8-bit conversion?

Options :

1. ✗ 256

2. ✗ 16

3. ✓ 8

4. ✗ 1

Question Number : 161 Question Id : 5069616376 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

For a step input, the output of an integrator is _____

Options :

1. ✗ a pulse

2. ✗ a spike

3. ✗ a triangular waveform

4. ✓ a ramp

Question Number : 162 Question Id : 5069616377 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In monostable 555 timer circuit, the output pulse width is determined by _____

Options :

1. ✓ capacitor
2. ✗ V_{cc}
3. ✗ trigger switch
4. ✗ 555 IC

Question Number : 163 Question Id : 5069616378 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which one of the following statements is correct in case of load regulation?

Options :

1. ✗ when the temperature changes, the output voltage remains constant
2. ✓ when the load changes, the output voltage remains constant
3. ✗ when the load changes, the load current remains constant
4. ✗ when the input voltage changes, the load current remains constant

Question Number : 164 Question Id : 5069616379 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Narrow band reject filter is also called _____

Options :

1. ✖ Sallen Key filter
2. ✖ Chebyshev filter
3. ✔ Notch filter
4. ✖ Harmonic filter

Question Number : 165 Question Id : 5069616380 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The silicon dioxide layer is used in ICs to _____

Options :

1. ✖ control the concentration of the diffused impurities
2. ✖ penetrate diffused impurities
3. ✖ conduct high heat
4. ✔ protect the surface of the chip from contaminants

Question Number : 166 Question Id : 5069616381 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Fundamental difference between microprocessor and microcontroller is

Options :

1. ✔

Microprocessor is a CPU, microcontroller is an integration of CPU, memory and I/O devices

2. ✖ Both microprocessor and microcontroller are same

3. ✖ Microprocessor is ALU, microcontroller is ALU and memory

4. ✖ Microprocessor is a CPU, microcontroller is integration of CPU and ALU

Question Number : 167 Question Id : 5069616382 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The RAM, ROM capacity of 8051 micro controller is

Options :

1. ✖ 1 KB RAM and 64 bytes ROM

2. ✖ 8 KB ROM and 256 bytes RAM

3. ✖ 4 KB RAM and 128 bytes ROM

4. ✔ 4 KB ROM and 128 bytes RAM

Question Number : 168 Question Id : 5069616383 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

When the PUSH and POP instructions are used in 8051 microcontroller

Options :

During subroutine call

1. ✖

2. ✔ To load or store data from stack memory

3. ✖ General data transfer between registers

4. ✖ I/O data transfer

Question Number : 169 Question Id : 5069616384 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following interfacing device will be used when the I/O device is fast compared to microcontroller

Options :

1. ✖ Programmed I/O

2. ✖ Interrupt initiated I/O

3. ✔ Direct memory access

4. ✖ Programmable interrupt controller

Question Number : 170 Question Id : 5069616385 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

How many timers/counters are there in 8051 microcontroller

Options :

1. ✔ 2

2. ✖ 3

3. ✖ 4

4. ✖ 8

Question Number : 171 Question Id : 5069616386 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

8051 microcontroller is manufactured by the company

Options :

1. ✖ Texas Instruments

2. ✖ Motorola

3. ✖ Samsung

4. ✔ Intel corporation

Question Number : 172 Question Id : 5069616387 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

How many I/O ports can be connected using 8255 interfacing IC

Options :

1. ✖ 1

2. ✖ 2

3. ✔ 3

4. ✖ 8

Question Number : 173 Question Id : 5069616388 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The ladder programming used in PLC is based on

Options :

- 1. ✖ Boolean algebra
- 2. ✖ Flow chart
- 3. ✔ Electrical relay logic
- 4. ✖ Sequential programming

Question Number : 174 Question Id : 5069616389 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The block diagram of PLC consists of

Options :

- 1. ✖ Sensors, actuators, control valves
- 2. ✖ Pneumatics, hydraulics and electronics
- 3. ✔ CPU, Memory, input/output modules
- 4. ✖ Motors, gears and bearings

Question Number : 175 Question Id : 5069616390 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following serves as the user interface that allows operators to visually monitor and control industrial processes by displaying real-time data, alarms, and trends through a user-friendly graphical interface, enabling them to make informed decisions and adjust settings as needed in SCADA

Options :

1. ✖ Master terminal unit
2. ✖ Field instruments
3. ✖ Remote terminal unit
4. ✔ Human machine interface

Question Number : 176 Question Id : 5069616391 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The basic functionality of digital control system gateway is

Options :

1. ✔ To exchange data with other networks
2. ✖ To convert analog signals into digital signals
3. ✖ To store the processed data
4. ✖ To provide power to other devices

Question Number : 177 Question Id : 5069616392 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The fundamental purpose of signal conditioning circuit in a data acquisition system is

Options :

1. ✖ Sampling operation
2. ✔ Boosting of the input signal
3. ✖ To multiplex the data
4. ✖ To convert the analog into digital data

Question Number : 178 Question Id : 5069616393 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

A manufacturing method that automates the control, movement and precision of machine tools through the use of pre-programmed computer software, which is embedded inside the tools is called as

Options :

1. ✖ SCADA
2. ✖ Data Acquisition System (DAS)
3. ✔ Computer Numerical Control (CNC)
4. ✖ Distributed Control System (DCS)

Question Number : 179 Question Id : 5069616394 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The internal resistance of the milli-ammeter must be ____ for minimum effect on the current in the circuit.

Options :

1. ✖ unity
2. ✔ very low
3. ✖ very high
4. ✖ infinity

Question Number : 180 Question Id : 5069616395 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In moving iron instruments, hysteresis error is reduced by using _____

Options :

1. ✖ stainless steel
2. ✖ silver coating
3. ✖ high speed steel
4. ✔ Permalloy

Question Number : 181 Question Id : 5069616396 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The term artificial aging in instruments is associated with _____

Options :

1. ✖ springs
2. ✖ damping
3. ✔ permanent magnets
4. ✖ controlling torques

Question Number : 182 Question Id : 5069616397 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Rectifier moving coil instruments respond to

Options :

1. ✖ peak value
2. ✔ average value
3. ✖ rms value
4. ✖ squared value

Question Number : 183 Question Id : 5069616398 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Maxwell's bridge is used for determination of _____ of coil having _____

Options :

1. ✖ inductance, high Q-factor
2. ✖ capacitance, high Q -factor

- 3. ✓ inductance, medium Q-factor
- 4. ✗ capacitance, medium Q-factor

Question Number : 184 Question Id : 5069616399 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A PMMC zero to 20 A ammeter is not provided with any controlling mechanism and the moving parts are free to rotate. If a current of 2 A dc is passed through the moving coil, then the _____

Options :

- 1. ✗ instrument will read 20 A
- 2. ✗ instrument will read 2 A
- 3. ✗ pointer will remain stationary
- 4. ✓ pointer will continually rotate

Question Number : 185 Question Id : 5069616400 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The offset control in the function generator is used to

Options :

- 1. ✗ adjust the frequency
- 2. ✗ adjust the amplitude
- 3. ✓

add DC component

4. ✖ change the waveform type

Question Number : 186 Question Id : 5069616401 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Digital LCR meter uses the principle of _____ for accurate measurement.

Options :

1. ✖ Wheatstone bridge

2. ✔ AC bridge method

3. ✖ Ohm's law

4. ✖ Logic circuits

Question Number : 187 Question Id : 5069616402 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A Wheatstone bridge requires a change of $10\ \Omega$ in the unknown arm of the bridge to produce a change in deflection of 5 mm of the galvanometer. The sensitivity of the instrument is

Options :

1. ✖ 2 %

2. ✖ $2.0\ \Omega/\text{mm}$

3. ✖ 0.5 %

4. ✓ 0.5 mm/ Ω

Question Number : 188 Question Id : 5069616403 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The deflection sensitivity of a CRT is defined as _____

Options :

1. ✓ deflection of the screen per deflection voltage
2. ✗ deflection voltage per deflection of the screen
3. ✗ size of the screen per deflection voltage
4. ✗ deflection current per deflection of the screen

Question Number : 189 Question Id : 5069616404 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A CRO with a time base setting of 5 ms/cm will have adjacent same sign peaks of a 50 Hz signal separated by

Options :

1. ✗ 10 cm
2. ✗ 5 cm
3. ✓ 4 cm
4. ✗ 3 cm

Question Number : 190 Question Id : 5069616405 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The advantage of X-Y recorders is

Options :

1. ✓ economical to operate
2. ✗ cheaper than strip-chart recorders
3. ✗ convenient for continuous recording
4. ✗ limited frequency response

Question Number : 191 Question Id : 5069616406 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Which of the following law states that the amount of light absorbed by a substance is directly proportional to the concentration of the substance and the length of the light's path through the substance

Options :

1. ✗ Snell's law
2. ✗ Law of refraction
3. ✗ Total internal reflection
4. ✓ Beer-Lambert Law

Question Number : 192 Question Id : 5069616407 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The wavelength of visible light range on the electromagnetic spectrum is typically considered to be

Options :

1. ✓ 400 nm to 700 nm

2. ✗ 100 nm to 200 nm

3. ✗ 250 nm to 380 nm

4. ✗ 800 nm to 900 nm

Question Number : 193 Question Id : 5069616408 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The relative permittivity of an optical medium is 2.5. Its refractive index is

Options :

1. ✗ 0.4

2. ✗ 1.25

3. ✓ 1.58

4. ✗ 1.6

Question Number : 194 Question Id : 5069616409 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A typical ECG signal generally falls within a frequency range of

Options :

1. ✓ 0.05 to 100 Hz
2. ✗ 1 to 200 Hz
3. ✗ 5 to 500 Hz
4. ✗ 50 to 500 Hz

Question Number : 195 Question Id : 5069616410 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The resolving power of a spectrometer consisting of a collimator, grating and a telescope can be increased by

Options :

1. ✗ increasing the angular magnification of telescope
2. ✗ increasing the period of grating
3. ✓ decreasing the period of grating
4. ✗ decreasing the slit-width of the collimator

Question Number : 196 Question Id : 5069616411 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A beam of unpolarised light is first passed through a linear polarizer and then through a quarter wave plate. The emergent beam is

Options :

1. ✗ Unpolarized

- 2. ✖ Linearly polarized
- 3. ✔ Circularly polarized
- 4. ✖ Elliptically polarized

Question Number : 197 Question Id : 5069616412 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The treadmill test is used to diagnose

Options :

- 1. ✖ The balancing style during walk of the patient
- 2. ✖ The auditory activity of the patient
- 3. ✖ The visual activity of the patient
- 4. ✔ The cardiac activity of the patient

Question Number : 198 Question Id : 5069616413 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The type of transducer commonly used for invasive blood pressure measurement.

Options :

- 1. ✖ Capacitive
- 2. ✖ Rheostatic

3. ✓ Piezoelectric

4. ✗ Potentiometric

Question Number : 199 Question Id : 5069616414 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Which characteristic of X-ray spectra does not change when the target material is changed?

Options :

1. ✗ Intensity

2. ✗ Wavelengths of characteristic lines

3. ✗ Shape of the continuous spectra

4. ✓ Cut-off wavelength

Question Number : 200 Question Id : 5069616415 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The commonly used MRI's have a magnetic strength of

Options :

1. ✓ 1.5 – 3 Tesla

2. ✗ 3 – 6 Tesla

3. ✗ 6 – 12 Tesla

4. ✗ 12 – 24 Tesla

