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: Computer Science and Engineering 20th May 2023 Shift1 SET1
Subject Name: Computer Science and Engineering
Creation Date: 2023-05-20 13:03:31
Duration: 180
Total Marks: 200
Display Marks: No
Share Answer Key With Delivery Engine: Yes
Actual Answer Key: Yes
Calculator: None
Magnifying Glass Required?: No
Ruler Required?: No
Eraser Required?: No
Scratch Pad Required?: No
Rough Sketch/Notepad Required?: No
Protractor Required?: No
Show Watermark on Console?: Yes
Highlighter: No
Auto Save on Console?: Yes
Change Font Color: No
Change Background Color: No
Change Theme: No
Computer Science and Engineering

Group Number : 1
Group Id : 15920726
Group Maximum Duration : 0
Group Minimum Duration : 180
Show Attended Group? : No
Edit Attended Group? : No
Break time : 0
Group Marks : 200
Is this Group for Examiner? : No
Examiner permission : Cant View
Show Progress Bar? : No

Mathematics

Section Id : 15920798
Section Number : 1
Section type : Online
Mandatory or Optional : Mandatory
Number of Questions : 50
Number of Questions to be attempted : 50
Section Marks : 50
Enable Mark as Answered Mark for Review and Clear Response : Yes
Maximum Instruction Time : 0
Question Number : 1 Question Id : 1592075016 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Let \( A = \begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix} \). If \( A^2 = \alpha A + \beta I \), where \( I \) is the 2 x 2 identity matrix, then \((\alpha, \beta) = \)

Options :

1. ✕

2. ✕

3. ✗

4. ✔

Question Number : 2 Question Id : 1592075017 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0
If \((a + b + c) = 5\), then

\[
\det \begin{bmatrix}
a - b - c & 2b & 2c \\
2a & b - c - a & 2c \\
2a & 2b & c - a - b
\end{bmatrix} =
\]

Options:

1. 5
2. 25
3. 125
4. 625

If \(\begin{bmatrix} 4 & 3 \\ 9 & 7 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 18 \\ 41 \end{bmatrix}\), then \(12x + 10y =\)

Options:

1. 58
2. 56
Question Number : 4 Question Id : 1592075019 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If \( \log_{16} x + \log_{4} x + \log_{2} x = 7 \), then \( x = \)

Options :
1. 16
2. 32
3. 64
4. 128

Question Number : 5 Question Id : 1592075020 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0
If \[
\frac{2x^2 - 6x + 5}{x^3 - 6x^2 + 11x - 6} = \frac{A}{x-1} + \frac{B}{x-2} + \frac{C}{x-3},
\]
then \[10A + B + 2C = \]

Options:
1. ✗ 5
2. ✗
3. ✔ 9
4. ✗ 11

If \(\log_x (3x^2 + 10x) = 3\), then \(x = \)

Options:
1. ✗ 3
2. ✔ 5
3. ✗ 7
4. ✗ 9
Question Number : 7 Question Id : 1592075022 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0

The value of $\sin^2 45^\circ + \sin^2 135^\circ + \sin^2 225^\circ + \sin^2 315^\circ$ is

Options :

1. ✗ 1

2. ✔ 2

3. ✗ 0

4. ✗ 4

Question Number : 8 Question Id : 1592075023 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0

In a $\triangle ABC$, if $a = 3$, $b = 4$ and $\sin A = \frac{3}{4}$, then the angle $B =$

Options :

1. ✗ $45^\circ$

2. ✗ $60^\circ$
Question Number : 9 Question Id : 1592075024 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

\[
\sin^2 36^\circ - \sin^2 18^\circ =
\]

Options :

1. \(\frac{1}{2}\)
2. \(\frac{1}{4}\)
3. \(\frac{1}{8}\)
4. 1

Question Number : 10 Question Id : 1592075025 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0
The period of the function \( \cos\left(\frac{5}{3}\right)\sin\left(\frac{2x}{3}\right) + \sin\left(\frac{5}{3}\right)\cos\left(\frac{2x}{3}\right) \) is

Options:

1. \( \pi \)
2. \( 2\pi \)
3. \( 3\pi \)
4. \( \frac{3\pi}{2} \)

If \( \cosh x = \frac{5}{4} \), then \( \coth 2x = \)

Options:

1. \( \frac{17}{15} \)
2. \( \frac{5}{3} \)
Question Number : 12 Question Id : 1592075027 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0

The modulus of the complex number \( \frac{2+i}{3-i} \) is

Options :

1. \( \frac{1}{\sqrt{3}} \)
2. 1
3. \( \sqrt{2} \)
4. \( \frac{1}{\sqrt{2}} \)

1. ✗
2. ✗
3. ✗
4. ☑
If the sides of a triangle are 13, 7 and 8, then the greatest angle of the triangle is

Options:

1. $\frac{\pi}{3}$

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

3. $\frac{2\pi}{3}$

4. $\frac{3\pi}{2}$

If the angles of a triangle are in the ratio of 1:4:5, then the ratio of the greatest side to the smallest side is

Options:
Number of tangents drawn at a point of the circle is

Options:

1. One

2. Two

3. Three

4. Many
The minimum value of \( f(x) = |x - 2| + |x + 2| \) is

Options:
1. \( 0 \) 
2. \( 2 \) 
3. \( 4 \) 
4. \( 8 \) 

The eccentricity of ellipse \( \frac{x^2}{16} + \frac{y^2}{4} = 1 \) is

Options:
1. \( 2\sqrt{3} \) 
2. \( \sqrt{2} \) 
3. ✔️
\[ \frac{\sqrt{3}}{2} \]

4. **

Question Number : 18  Question Id : 1592075033  Question Type : MCQ Option Shuffling : Yes  Display Question Number : Yes  Is Question Mandatory : No  Calculator : None  Response Time : N.A  Think Time : N.A  Minimum Instruction Time : 0  Correct Marks : 1  Wrong Marks : 0

\[ \lim_{{x \to \infty}} \left( 1 + \frac{2}{x} \right)^x = \]

Options :

1. **
2. ✔
3. **
4. **

Question Number : 19  Question Id : 1592075034  Question Type : MCQ Option Shuffling : Yes  Display Question Number : Yes  Is Question Mandatory : No  Calculator : None  Response Time : N.A  Think Time : N.A  Minimum Instruction Time : 0  Correct Marks : 1  Wrong Marks : 0
\[
\frac{d}{dx} \left( \sqrt{\sin \sqrt{x}} \right) =
\]

Options:

1. \( \frac{1}{4} \sin \sqrt{x} \sqrt{x} \)

2. \( \frac{1}{6} \cos \sqrt{x} \sqrt{x} \)

3. \( \frac{1}{4} \frac{\cos \sqrt{x}}{\sqrt{x} \sin \sqrt{x}} \)

4. \( \frac{1}{2} \frac{\cos \sqrt{x}}{\sin \sqrt{x}} \)

If \( x = 2\cos t - \cos 2t, \ y = 2\sin t - \sin 2t \), then \( \frac{dy}{dx} \) at \( t = \frac{\pi}{6} \) is

Options:

1. 0

2. 1
Question Number: 21  Question Id: 1592075036  Question Type: MCQ  Option Shuffling: Yes  
Display Question Number: Yes  Is Question Mandatory: No  Calculator: None  Response Time: N.A  Think Time: N.A  Minimum Instruction Time: 0  
Correct Marks: 1  Wrong Marks: 0  

If \( y = \cos (x + y) \), then \( \frac{dy}{dx} = \) 

Options:

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

2. \( \frac{1 + \sin(x + y)}{\cos x - \cos y} \)

3. \( \frac{\cos(x + y)}{1 + \sin(x + y)} \)

4. \( \frac{-\sin(x + y)}{1 + \sin(x + y)} \)
The equation of tangent to the curve $xy = 16$ at $P (4, 4)$ is

Options:

1. $x + y = 2$

2. $x + y = 4$

3. ✔ $x + y = 8$

4. ✗ $x + y = 16$

The maximum value of $f(x) = \left( \frac{1}{x} \right)^x$ is

Options:

1. ✔ $e^{1/e}$

2. ✗ $\left( \frac{1}{e} \right)^e$
3. \( \left( \frac{1}{e} \right)^L \)

4. \( e^e \)

**Question Number : 24 Question Id : 1592075039 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0**

If \( u(x, y, z) = \log \left( x^3 + y^3 + z^3 - 3xyz \right) \), then \( \frac{\partial u}{\partial x} + \frac{\partial u}{\partial y} + \frac{\partial u}{\partial z} = \)

**Options :**

1. \( \frac{1}{x + y + z} \)

2. \( \frac{9}{x + y + z} \)

3. \( \frac{6}{x + y + z} \)

4. \( \frac{3}{x + y + z} \)
If \( u(x, y) = \log \left( \frac{x^4 + y^4}{x + y} \right) \), then \( x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y} = \)

Options:

1. ✗

2. ✓

3. ✗

4. ✗

\[
\int \frac{\sin(\tan^{-1} x)}{1 + x^2} \, dx =
\]

Options:

1. ✓

\(-\cos(\tan^{-1} x) + c\)

2. ✗

\(\cos(\tan^{-1} x) + c\)
3. \[ \sin(\tan^{-1}x) + c \]

4. \[ -\sin(\tan^{-1}x) + c \]

---

**Question Number : 27**  **Question Id : 1592075042**  **Question Type : MCQ**  **Option Shuffling : Yes**

Display Question Number : Yes  Is Question Mandatory : No  Calculator : None  Response Time : N.A  Think Time : N.A  Minimum Instruction Time : 0

Correct Marks : 1  Wrong Marks : 0

\[ \int \frac{1}{e^{2x} + e^x} \, dx \]

**Options :**

1. \[ \log (e^x + 1) - e^{-x} + c \]

2. \[ \log \left( \frac{e^x + 1}{e^x} \right) + c \]

3. \[ \log (e^{-x} + 1) - e^{-x} + c \]

4. \[ \log \left( \frac{e^{-x}}{e^x + 1} \right) + e^{-x} + c \]

---

**Question Number : 28**  **Question Id : 1592075043**  **Question Type : MCQ**  **Option Shuffling : Yes**
The value of the integral \( \int_{\frac{\pi}{2}}^{\frac{\pi}{2}} \sin |x| \, dx \) is

Options:

1. 0

2. 1

3. -2

4. 2

The curves \( y = x^2 - 4 \) and \( y = 1 - x^2 \) together enclose an area of

Options:

1. 10\sqrt{10}

2. 5\sqrt{10}

3. 2\sqrt{10}
The RMS value of the \( f(x) = \sqrt{\log(x)} \) on \([1, e]\) is

Options:

1. \( \frac{\sqrt{e}}{\sqrt{e-1}} \)  
2. \( \frac{\sqrt{e-1}}{\sqrt{e}} \)  
3. \( \frac{1}{\sqrt{e-1}} \)  
4. \( \sqrt{e-1} \)
The approximate value of the integral \( \int_{0}^{1} \frac{1}{1+x} \, dx \), using Trapezoidal rule with \( h = 0.5 \), is

Options:

1. \( 0.69450 \)
2. \( 0.70834 \)
3. \( 0.67435 \)
4. \( 0.68500 \)

The velocity of a body as a function of time is given as

\[ v(t) = 5e^{-2t} + 4, \] where \( t \) is in seconds and \( v \) is in m/s. The acceleration when \( t = 5 \) in m/s\(^2\) is

Options:

1. \( -10e^{-10} \)
The order and degree of the differential equation

\[ \frac{d^2y}{dx^2} + \left( \frac{dy}{dx} \right)^2 + x = 0 \]

respectively are

Options:

1. 3 and 3

2. 2 and 2

3. 2 and 3

4. ✔ 2 and 1
The general solution of \( ye^x \, dx + (y - 1) \, dy = 0 \) is

Options:

1. \( e^x - \log y = c \)

2. \( e^x - y = c \)

3. \( e^x - y - \log x = c \)

4. \( e^x + y - \log y = c \)

If \( \sin x \frac{dy}{dx} + y \cos x = x \sin x \), then \((y - 1) \sin x =

Options:

1. \( c - x \sin x \)

2. \( c + x \sin x \)
3. $c - x \cos x$

4. $c + x \cos x$

Question Number : 36 Question Id : 1592075051 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

The solution of the differential equation

$$(e^y + 1)\cos x \, dx + e^y \sin x \, dy = 0$$

is

Options :

1. $$(e^y + 1)\sin x = c$$

2. $$e^x \sin x = c$$

3. $$(e^x + 1)\cos x = c$$

4. $$(e^y - 1)\sin x = c$$

Question Number : 37 Question Id : 1592075052 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
The differential equation satisfied by \( y = \frac{A}{x} + B \), (A,B are parameters) is

Options:

1. \( x^2y_1 = y \)

2. \( xy_1 + 2y_2 = 0 \)

3. \( xy_2 + 2y_1 = 0 \)

4. \( x^2y_1 - 2y = 0 \)

The general solution of \( \log\left(\frac{dy}{dx}\right) = 3x + 3y \) is

Options:

1. \( e^{3x} + e^{3y} = c \)

2. \( e^{-3x} + e^{-3y} = c \)
3. \[ e^{-3x} + e^{3y} = c \]

4. \[ e^{3x} + e^{-3y} = c \]

Question Number : 39 Question Id : 1592075054 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0

If \( y \, dx + y^2 \, dy = x \, dy, x \in \mathbb{R}, y > 0 \) and \( y(1) = 1 \), then \( y(-3) = \)

Options :

1. 3
2. 2
3. 1
4. 5

Question Number : 40 Question Id : 1592075055 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0
\[ L\{\sin 2t - 2t \cos 2t\} = \]

Options:

1. \[\frac{2}{(s^2 + 4)^2}\]
2. \[\frac{8}{(s^2 + 4)^2}\]
3. \[\frac{16}{(s^2 + 4)^2}\]
4. \[\frac{32}{((s^2+4))^2}\]

Question Number : 41 Question Id : 1592075056 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

\[ L\{\cosh 3t \cos 3t\} = \]

Options:

1. \[\frac{1}{2}\left[\frac{s-6}{s^2-3s+18} + \frac{s+6}{s^2+3s+18}\right]\]
2. ✔
\[ \frac{1}{2} \left[ \frac{s-3}{s^2-6s+18} + \frac{s+3}{s^2+6s+18} \right] \]

\[ \frac{1}{2} \left[ \frac{s-4}{s^2-4s+9} + \frac{s-3}{s^2-6s+9} \right] \]

\[ \frac{1}{2} \left[ \frac{s-6}{s^2+9} + \frac{s+6}{3s^2+9} \right] \]

Question Number: 42  Question Id: 1592075057  Question Type: MCQ  Option Shuffling: Yes  Display Question Number: Yes  Is Question Mandatory: No  Calculator: None  Response Time: N.A  Think Time: N.A  Minimum Instruction Time: 0  Correct Marks: 1  Wrong Marks: 0

\[ L \left\{ \frac{1-\cos^3 t}{t} \right\} = \]

Options:

1. \[ \frac{1}{2} \log \left( \frac{s^2+9}{s^2+3} \right) \]

2. \[ \frac{1}{2} \log \left( \frac{s}{s+9} \right) \]

3. \[ \frac{1}{2} \log \left( \frac{s}{s^2+9} \right) \]

4.
\[ \frac{1}{2} \log \left( \frac{s^2 + 9}{s^2} \right) \]

The Laplace transform of \( f(t) = t \sin t \) is \( F(s) \) where \( F(s) = \)

Options:

1. \[ \frac{s}{(1 + s^2)^2} \]
2. \[ \frac{2s}{(1 + s^2)^2} \]
3. \[ \frac{2s}{1 + s^2} \]
4. \[ \frac{s}{1 + s^2} \]
If \( L^{-1}\left\{ \frac{2s^2 - 1}{(s^2 + 1)(s^2 + 4)} \right\} = f(t) \), then \( f\left(\frac{\pi}{2}\right) = \)

Options:

1. ✗

2. ✓

3. ✗

4. ✗

Question Number : 45 Question Id : 1592075060 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

\[
\int_0^\infty \frac{e^{-3t} - e^{-6t}}{t} \, dt = \]

Options:

1. ✗

2. ✗

3. ✓

log 2
4. \[ \log 18 \]

Question Number: 46  Question Id: 1592075061  Question Type: MCQ  Option Shuffling: Yes  Display Question Number: Yes  Is Question Mandatory: No  Calculator: None  Response Time: N.A  Think Time: N.A  Minimum Instruction Time: 0  Correct Marks: 1  Wrong Marks: 0

The solution of the differential equation

\[ y'' - 2y' + 2y = 0 \]  satisfying \( y(0) = y'(0) = 1 \)  is

Options:

1.  \( e^t + e^{-2t} \)  cost
2.  \( e^t + \cos t \)
3.  \( e^t \sin t \)
4.  ✔  \( e^t \)  cost

Question Number: 47  Question Id: 1592075062  Question Type: MCQ  Option Shuffling: Yes  Display Question Number: Yes  Is Question Mandatory: No  Calculator: None  Response Time: N.A  Think Time: N.A  Minimum Instruction Time: 0  Correct Marks: 1  Wrong Marks: 0

The value of the Fourier coefficient \( a_0 \) in the Fourier series expansion of \( f(x) = x \sin x \) in \((0, 2\pi)\) is
If $b_1$, $b_2$ are Fourier coefficients in the Fourier series expansion of $f(x) = |\sin x|$ in $(-\pi, \pi)$, then $b_1 + b_2 =$

Options:

1. $\frac{2}{\pi}$

2. $-\frac{2}{\pi}$

3. 0
4. \[ \frac{4}{\pi} \]

Question Number : 49 Question Id : 1592075064 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0

At \( x = 0 \), the Fourier series of \( f(x) \) = \[ \begin{cases} \pi + x & \text{if } -\pi < x < 0 \\ 0 & \text{if } 0 \leq x < \pi \end{cases} \]
converges to

Options :

1. \[ \pi \] ✗

2. 0 ✗

3. \( -\pi \) ✗

4. \[ \frac{\pi}{2} \] ✓

Question Number : 50 Question Id : 1592075065 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0
If \( x = \frac{\pi}{2} + \sum_{n=1}^{\infty} a_n \cos nx, \quad 0 < x < \pi, \) then the value of \( a_n \) is

Options:

1. \( \frac{2}{\pi n^2} \left[ (-1)^n - 1 \right] \)

2. \( \frac{2}{\pi n^2} \)

3. 0

4. \( \frac{4}{\pi n^2} \)
If F is force, x is distance and t is time, then the dimensions of \( \frac{b}{a} \) in the equation \( F = \frac{b-x}{at} \) are same as that of

Options:

1. ✔

2. ✗

3. ✔

4. ✗
The static friction is

Options:

1. ✗

   Equal to the dynamic friction

2. ✓

   Always greater than the dynamic friction

3. ✗

   Always less than the dynamic friction

4. ✗

   Sometimes less than and sometimes equal to dynamic friction

A vector \( \mathbf{A} \) points vertically upward and \( \mathbf{B} \) points towards north, the vector product of \( \mathbf{B} \times \mathbf{A} \) is

Options:

1. ✗

   Along west

2. ✓

   Along east

3. ✗

   Vertically downward
Question Number : 54 Question Id : 1592075069 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0 A Vector A has magnitude 9/2 unit towards north, the direction of vector -6A and 8A.

Options:

1. -27 units and 36 units towards south
2. -27 units and 36 units towards north
3. -27 units towards south and 36 units towards north
4. -27 units towards west and 36 units towards east

Question Number : 55 Question Id : 1592075070 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0 The Angular displacement of a particle is described as \( \theta = 2t + 3t^2 \), the angular velocity (in rad/sec) at \( t = 2 \) sec is
The acceleration of a car moving on a straight road with a constant velocity of 40 m/sec is

Options:

1. 30 m/s²

2. 20 m/s²

3. 0 m/s²
4. \[ 40 \, \text{m/s}^2 \]

Two wires of same length and made with same material are stretched with the same force. If the radii of the wires are in the ratio 1:3, then the ratio of their elongations is

Options:

1. 1:3
2. 9:1
3. 3:1
4. 1:9

Question Number : 58 Question Id : 1592075073 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Along a streamline flow of fluid

Options:
The velocity of all fluid particles at a given instant is constant.

1. ✗

The velocity of a fluid particle remains constant.

2. ✗

The velocity of all fluid particles crossing a given position is constant.

3. ✓

The speed of a fluid particle remains constant.

4. ✗

Which of the following gives the relation between \( C_p \) and \( C_v \)?

Options:

1. ✓ \( C_p - C_v = R \)

2. ✗ \( C_p = C_v \)

3. ✗ \( C_p - C_v > R \)
\( \frac{C_p}{C_v} = R \)

4. **

Question Number : 60 Question Id : 1592075075 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Compressed air coming out of punctured football becomes cooler because.

Options :

1. Adiabatic expansion

2. **Isothermal expansion

3. **Energy dissipation

4. **See-beck effect

Question Number : 61 Question Id : 1592075076 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

The work done (Joule) by a 1 mole of a perfect gas when it expands isothermally to double its volume. The initial temperature of the gas is \(0^\circ C\) and \(R = 8.31 \times 10^7 \text{ erg} \cdot \text{mol}^{-1} \cdot \text{K}^{-1}\). \(\log_{10}2 = 0.3010\)
The energy possessed by an object, by virtue of its motion is termed as

Options:

1. Potential Energy

2. Kinetic Energy

3. Gravitational Energy

4. Nuclear Energy
Question Number : 63 Question Id : 1592075078 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0

At what speed the observer must move towards a stationary source so that the apparent frequency will be double the original frequency of the source? The velocity of sound is \( V \).

Options :

1. \( V \)
2. \( \frac{V}{2} \)
3. \( 2V \)
4. \( \frac{V}{4} \)

Question Number : 64 Question Id : 1592075079 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0

The displacement equation of a particle executes SHM is given by \( y = a \sin \omega t + b \cos \omega t \), the resultant amplitude is
The periodic time (T) of simple pendulum is observed for different lengths (L). If a graph of \( \log_{10}L \) against \( \log_{10}T \) is plotted, the slope of the graph will be

Options:

1. \( \frac{1}{2} \)

2. \( -\frac{1}{2} \)

3. \( 2^{\frac{1}{2}} \)
Question Number: 66  Question Id: 1592075081  Question Type: MCQ  Option Shuffling: Yes
Display Question Number: Yes  Is Question Mandatory: No  Calculator: None  Response Time: N.A  Think Time: N.A  Minimum Instruction Time: 0
Correct Marks: 1  Wrong Marks: 0

The maximum velocity of a particle performing SHM is 0.12 m/sec, if its maximum acceleration is 0.48 m/sec², then its time period (sec) is

Options:

1. ✗ 1.54
2. ✗ 1.59
3. ✓ 1.57
4. ✗ 1.75
Question Number : 68 Question Id : 1592075083 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

$N_1$ and $N_2$ be the number of atoms in the ground and excited states. Then the condition for population inversion is

Options :

1. $N_1 = N_2$

2. $N_1 > N_2$

3. $N_2 > N_1$

4. $N_2 = 0$
Question Number : 69 Question Id : 1592075084 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Two magnets have magnetic moments in the ratio 2:1. Their pole strengths are in the ratio 1:2. Then the ratio of their magnetic lengths is

Options :
1. ✗ 1:4
2. ✗ 1:1
3. ✗ 2:3
4. ✔ 4:1

Question Number : 70 Question Id : 1592075085 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

The susceptibility of para magnetic material is

Options :
Positive and small
1. ✔
Positive and large

Negative

Zero

There are three equal resistors, how many different combinations of these resistors are possible.

Options:

1. Four

2. Two

3. Three

4. Five
Which one of the following is the perfect diamagnetic?

Options:

1. Any conductor

2. P-Type semiconductor

3. N-Type semiconductor

4. Superconductor

The current in the PN junction diode during the reverse bias is the result of

Options:

1. Majority carriers

2. Minority carriers
4. Both majority and minority carriers

Only electrons

Question Number : 74 Question Id : 1592075089 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0
Which of the following has maximum energy gap?

Options :

1. ✔ Insulators

2. ✗ Superconductors

3. ✗ Metals

4. ✗ Semiconductors

Question Number : 75 Question Id : 1592075090 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0
Which of the following is true for Fermi energy level for p-type extrinsic semiconductor?
At middle of the band gap

Close to valence band

Close to conduction band

Fermi level does not exist
The values of Azimuthal and principal quantum numbers respectively for an electron that is present in 4d orbital

Options:

1. 1 and 4

2. 4 and 1

3. 2 and 4

4. 4 and 2

Which of the following molecule has ionic bonding?

Options:

1. CH₃Cl

2. CH₃OH
3. CO₂

4. MgO

What is the Oxidation number of carbon in formaldehyde?

Options:

1. -4

2. +4

3. 0

4. +2

The Molarity of a solution containing 9 g of glucose (molar mass 180) in 500 g of water is
Prussian blue colloid is

Options:

1. \( \text{As}_2\text{S}_3 \)

2. \( \text{Fe} (\text{OH})_3 \)

3. \( \text{KFe[Fe(CN)]}_6 \)

4. \( \text{FeCl}_3 \)
Which of the following anions is the strongest base?

Options:

1. $\text{ClO}^-$

2. $\text{ClO}_2^-$

3. $\text{ClO}_3^-$

4. $\text{ClO}_4^-$

The pH of $10^{-9}$ molar solution of HCl is

Options:

1. $9$

2. $-9$

3. Between 7 & 8
4. Between 6 & 7

Question Number : 83 Question Id : 1592075098 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Which one of the following is a Renewable energy source?

Options :

1. Petroleum

2. Coal

3. Natural gas

4. Wind mills

Question Number : 84 Question Id : 1592075099 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Which of the following gas is responsible for depletion of ozone layer in the atmosphere?

Options :
Question Number : 85 Question Id : 1592075100 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

The exhausted permanganite is regenerated by percolating through it a solution of

Options :

1. ☒ Calcium chloride

2. × Zinc chloride

3. ✔ Sodium chloride

4. × Magnesium chloride
During reverse osmosis:

Options:

1. Dissolved salts are pushed out through semipermeable membrane

2. Only dissolved ionic salts are pushed out through the semipermeable membrane

3. Pure water is pushed out through semipermeable membrane

4. Both water and dissolved salts are pushed out through the semipermeable membrane

Which of the following is a weak electrolyte?

Options:

1. HCl

2. NaOH
3. \( \text{CH}_3\text{COOH} \)

4. \( \text{H}_2\text{SO}_4 \)

Question Number : 88 Question Id : 1592075103 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

When 2 amperes of current is passed through \( \text{CuSO}_4 \) solution for 10 minutes, the amount of \( \text{Cu} \) deposited is \((\text{Atomic weight of Cu} = 63.5 \text{ g})\)

Options :

1. \( 3.94 \text{ g} \)

2. \( 0.394 \text{ g} \)

3. \( 0.788 \text{ g} \)

4. \( 7.88 \text{ g} \)

Question Number : 89 Question Id : 1592075104 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Composition of Nichrome alloy is

Options:

1. Ni:68%, Cu:27%, Fe:5%

2. Ni:78%, Cr:20%, Fe:2%

3. Ni:40%, Cu:60%

4. Al:95%, Cu:2%, Ni:1%

In the froth flotation method, pine oil

Options:

1. Increases the surface tension of the solution

2. Acts as a collector

3. Does not affect the surface tension of the solution

4. Decreases the surface tension of the solution
During electro chemical corrosion in acidic environment

Options:

1. Hydrogen evolution takes place ✓
2. Oxygen evolution takes place ❌
3. Oxygen absorption occurs ❌
4. Hydrogen absorption takes place ❌

The process of coating of iron with zinc metal is known as

Options:

1. Galvanizing ✓
2. ❌
Question Number : 93 Question Id : 1592075108 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Bakelite is prepared by the condensation polymerization of

Options :

1. Phenol and formaldehyde

2. Urea and formaldehyde

3. Phenol and acetaldehyde

4. Urea and acetone

Question Number : 94 Question Id : 1592075109 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
The trade name of the polymer coated on non-stick utensils is

Options:

1. × Dacron

2. × Orlon

3. ✓ Teflon

4. × Nylon

Octane number of a petrol that consists 20:80 mixture of n-heptane and 2,2,4-trimethyl pentane is

Options:

1. × 100

2. × 0

3. ✓ 80

4. × 20
Producer gas is a mixture of

Options:

1. \( \text{CO}_2 + \text{H}_2 \)
2. \( \text{CO} + \text{N}_2 \)
3. \( \text{CO} + \text{CH}_4 \)
4. \( \text{CH}_4 + \text{H}_2 \)

For the following cell reaction

\[
\text{Fe} + \text{Ni}^{2+} \overset{(a=1)}{\rightarrow} \text{Fe}^{2+} + \text{Ni}
\]

The EMF of the cell at 298 K is \( \frac{\hat{E}}{\text{Fe}^{2+}/\text{Fe}} = -0.440 \, \text{V} ; \frac{\hat{E}}{\text{Ni}^{2+}/\text{Ni}} = -0.250 \, \text{V} \)

Options:

1. \(-0.190 \, \text{V}\)
2. $+0.190\, V$

3. $+0.690\, V$

4. $-0.690\, V$

In Hydrogen-Oxygen fuel cell, the reaction at the cathode is

Options:

1. $O_2(g) + 4H^+ + 4e^- \rightarrow 2H_2O$

2. $4H^+ + 4e^- \rightarrow 2H_2(g)$

3. $2H_2O \rightarrow O_2(g) + 4H^+ + 4e^-$

4. $2H_2(g) + 4OH^- \rightarrow 4H_2O(l) + 4e^-$
Which of the following statements is true about SMOG?

Options:

1. SMOG is derived from the fog
2. SMOG is derived from smoke
3. SMOG is derived from water vapour
4. SMOG is derived from both fog and smoke

What do BOD and COD stand for?

Options:

1. Biological Oxygen Demand and Chemical Oxygen Demand respectively
2. Chemical Oxygen Demand and Biological Oxygen Demand respectively
3. Botanical Oxygen Demand and Chemical Oxygen Demand respectively
Which statement best describes a Karnaugh map?

Options:

1. It is simply a rearranged truth table
2. The Karnaugh map eliminates the need of using NAND and NOR gates

3. Variable complement can be eliminated using Karnaugh maps

4. A Karnaugh map can be used to replace Boolean rules

The number of distinct Boolean expressions for 4 variables is

Options:

1. 16

2. 256

3. 1024

4. 65536
An SR flip flop is converted to ____ flip flop by inserting an inverter between S&R and assigning a single input.

Options:

1. Master Slave
2. T
3. JK
4. D

A Combinational circuit that converts the binary information from 2^n inputs to n outputs is

Options:

1. Decoder
2. Multiplexer
Question Number : 105 Question Id : 1592075120 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Convert the decimal number 41.6875 into binary

Options :

1. 101001.0111000111101

2. 101001.111000111101

3. * 101001.1101

4. ✔ 101001.1011

Question Number : 106 Question Id : 1592075121 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0
Find the 4's complement of a number 12302 (base 4)

Options:

1. ✗ 32002

2. ✗ 32003

3. ✓ 21032

4. ✗ 21031

How many gates would be required to implement the following Boolean expression after simplification?

\[ XY + X(X+Z) + Y(X+Z) \]

Options:

1. ✗

2. ✓

3. ✗
Question Number : 108 Question Id : 1592075123 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

The logical expression $Y = A + \bar{A} B$ is equivalent to

Options :

1. $Y = AB$

2. $Y = \bar{A} + B$

3. $Y = \bar{A} B$

4. $Y = A + B$

Question Number : 109 Question Id : 1592075124 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

The number of selection inputs required for a 64 x 1 Multiplexer (Mux) are

Options :
The size of main memory is 32K x 16 bits. The number of address lines are

Options:

1. 16
2. 15
3. 14
4. 13
The 8086 fetches instruction one after another from ________ of memory

Options:

1. Instruction pointer

2. Extra segment

3. Code segment

4. Stack segment

In 8086 the overflow flag is set when__________

Options:

1. Subtraction

2. Signed numbers go out of their range after an arithmetic operation.
3. ✗

The sum is more than 16 bits.

4. ✗

Carry and sign flags are set.

---

Question Number : 113 Question Id : 1592075128 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

The Pin of minimum mode AD0-AD15 has ________ data bus

Options :

1. ✓ 16 bit

2. ✗ 8 bit

3. ✗ 32 bit

4. ✗ 20 bit

---

Question Number : 114 Question Id : 1592075129 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0
A ______ instruction at the end of interrupt service program takes the execution back to the interrupted program.

Options:

1. **Exit**

2. ✅ Return

3. ✗ Halt

4. ✗ Back

Which of the following represents the definition of the JNP instruction in 8086 microprocessor?

Options:

1. ✗ JUMP IF CF=0

2. ✗ JUMP IF CF=1

3. ✅ JUMP IF PF=0
JUMP IF PF=1

Question Number : 116 Question Id : 1592075131 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0

Given the following instruction:
MOV AX, 02H [BX] [SI]
Consider the following data:
DS = 3290H ; SS = 1004H ; ES = 4237H ; BX = 1100H ; SI = 1101H
Find the effective address location for the given instruction.

Options :

1. ** 4447E H

2. ** A234F H

3. ** 35254 H

4. ✔ 34B03 H
The instruction that is used to convert the result of the addition of two packed BCD numbers to a valid BCD number is ________

Options:

1. DAS

2. DAA

3. AAA

4. AAS

Consider the following 8086 assembly language program:

```
MOV AX, BB11H
MOV CX,1122H
ADD AX,CX
HLT
```

The result of this program is ________

Options:

1. AX=BB11H

2. CX=BB11H
3. ❌ CX=CC33H

4. ✔ AX=CC33H

Question Number : 119 Question Id : 1592075134 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0

In which mode do all the Ports of the 8255 PPI work as Input-Output units for data transfer?

Options :

1. ❌ BSR mode

2. ❌ Mode 1 of I/O mode

3. ✔ Mode 0 of I/O mode

4. ❌ Mode 2 of I/O mode

Question Number : 120 Question Id : 1592075135 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0
Which chip is used for AD & DA converters in 8086 processor?

Options:

1. ✓ 8251
2. ✗ 8255
3. ✗ 8259
4. ✗ 8254

The [ ] contains electronic circuits for communication and controlling the transfer of information between the computer and the peripheral devices.

Options:

1. ✗ Input Processor
2. ✗ Output Processor
3. ✓ Input-Output Processor
Question Number : 122 Question Id : 1592075137 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

The representation of 4385 in BCD requires _______ flip-flops.

Options :

1. 4

2. 16

3. 8

4. 2

Question Number : 123 Question Id : 1592075138 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Which of the following does not come under basic computer instruction format?

Options :

1. Memory Reference Instruction
The following register transfer indicates which addressing mode?

AC ← M[ADR + XR]

Options:

1. Direct address
2. Relative address
3. Indirect address
4. Index addressing
The _____ circulates the bits of the register around the two ends without loss of information.

Options:

1. Rotate operation
2. Logical shift
3. Arithmetic shift
4. Parity shift

In associative memory, which register will provide a mask for choosing a particular field or key in the argument word.

Options:

1. Argument Register
If the active portions of the program and data are placed in a fast small memory, the average memory access time can be reduced, thus reducing the total execution time of the program. Such a fast small memory is referred to as a

Options:

1. Associative Memory
2. Main Memory
3. Cache Memory
4. Auxiliary Memory
When a program starts execution, one or more pages are transferred into main memory and the page table is set to indicate their position. The program is executed from main memory until it attempts to reference a page that is still in auxiliary memory. This condition is called _______.

Options:

1. Address fault

2. Memory fault

3. Frame fault

4. Page fault

The transfer of data between a fast storage device such as magnetic disk and memory is often limited by the speed of the CPU. Removing the CPU from the path and letting the peripheral device manage the memory buses directly. This technique is known as DMA.

Options:

1. DMA
As a part of interrupt initiated I/O, the source that interrupts supplies the branch information to the computer. This information is called the _________.

Options:

1. Priority interrupt
2. Vectored interrupt
3. Scalar interrupt
4. Nonscalar interrupt
What is the relationship among the datatypes of C language with respect to the memory requirement?

Options:

1. \( \text{char} \leq \text{int} \leq \text{float} \leq \text{double} \)

2. \( \text{char} \geq \text{int} \geq \text{float} \geq \text{double} \)

3. \( \text{int} \geq \text{char} \geq \text{float} \geq \text{double} \)

4. \( \text{int} \leq \text{char} \leq \text{float} \leq \text{double} \)

Which of the following is a ternary operator in C language?

Options:

1. ++

2. --
Which of the following operator is having Right to Left Associativity?

Options:

1. +
2. >=
3. <=
4. %
This program prints 45, what is the statement to be written at the ‘MISSINGPART’ part of the program.

```c
#include<stdio.h>
int main()
{
    int a=45,*p1,**p2,***p3,***p4;
    p1=&a;
    p2=&p1;
    p3=&p2;
    printf("%d", ***p3);
    return 0;
}
```

Options:

1. ✅ ***p3

2. ✗ **p3

3. ✗ *p3

4. ✗ p3
What is the output of the following code?
#include<stdio.h>
int main()
{
    int a=100;
    if(a>10)
        printf("Delhi ");
    if(a>20)
        printf("Mumbai ");
    else
        printf("Hyderabad ");
    return 0;
}

Options :

1. Delhi

2. Delhi Hyderabad

3. ✓ Hyderabad

4. ✗
This program prints the character ‘C’, what is the statement to be written at the ‘MISSING STATEMENT’ part of the program.

```c
#include<stdio.h>
int main()
{
    char *p1;
    //MISSING STATEMENT
    printf("%c",p1[2]);
    return 0;
}
```

Options:

1. ✓
   - `p1=a;`

2. ✗
   - `a=p1;`

3. ✗
   - `&p1=&a1;`

4. ✗
   - `*p1=*a1`

Question Number : 137 Question Id : 1592075152 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0
By using the statement:
int a[2][3];
If we assume that
(i) int occupies 2 bytes
(ii) index in the memory is made with column major form, and
(iii) Starting address of this array is 1000.
Then what is the address of a[1][1]

Options:

1. ✗ 1002

2. ✗ 1004

3. ✔ 1006

4. ✗ 1008

The member variable of a structure is accessed by using

Options:

1. ✔ dot () operator

2. ✗ arrow (→) operator
3. *

asterisk (*) operator

4. *

ampersand (&) operator

Question Number : 139 Question Id : 1592075154 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Which one of the following is not an application of a stack?

Options :

1. ** Balancing symbols

2. ** Evaluation of a postfix expression

3. * Recursion

4. ✔ Job scheduling

Question Number : 140 Question Id : 1592075155 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Time complexity of the following code segment is

```python
for (i=1; i ≤ n; i=i*2)
    print("If hard work is your weapon then success is your slave")
```

Options:

1. O(n)
2. O (log n)
3. O(1)
4. O(2n)

Which one of the following is not true?

Options:

1. A tree is a connected graph without cycles
Every binary tree with 6 nodes contains at least two leaf nodes

A tree with 200 nodes contains 199 edges

Every node in a rooted binary tree has a parent

Question: Which of the following sorting algorithm has highest Average-case time complexity?

Options:

1. Merge Sort
2. Quick Sort
3. Bubble Sort
4. Heap Sort
Which one of the following sorting algorithms efficiently sorts the array $A[1...n]$ in ascending order.

Options:

1. Insertion sort
2. Merge sort
3. Selection sort
4. Bubble sort

Which one of the following is true about the sequential search to search in an array of $n$ elements?

Options:

1. Best-case running time of sequential search is $O(1)$
2. Best-case running time of sequential search is $O(n)$
Worst-case running time of sequential search is $O(n^2)$

Worst-case running time of sequential search is $O(\log n)$

Question Number : 145  Question Id : 1592075160  Question Type : MCQ  Option Shuffling : Yes  Display Question Number : Yes  Is Question Mandatory : No  Calculator : None  Response Time : N.A  Think Time : N.A  Minimum Instruction Time : 0
Correct Marks : 1  Wrong Marks : 0

Which one of the following is a recurrence for the worst-case running time of binary search?

Options :

1. $T(n)=T(n-1)+1$ ✗

2. $T(n)=T(\log n)+c$ ✗

3. $T(n)=T(n/2)+c$ ✓

4. $T(n)=T(n/4)+c$ ✗

Question Number : 146  Question Id : 1592075161  Question Type : MCQ  Option Shuffling : Yes  Display Question Number : Yes  Is Question Mandatory : No  Calculator : None  Response Time : N.A  Think Time : N.A  Minimum Instruction Time : 0
The protocol data unit (PDU) for the application layer in the Internet stack is

Options:

1. Segment
2. Datagram
3. Message
4. Frame

Which of the following transport layer protocols is used to support electronic mail?

Options:

1. SMTP
2. IP
3. TCP
4. None

Correct Marks: 1 Wrong Marks: 0
UDP

Question Number : 148 Question Id : 1592075163 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0

How many bits are allocated for network id (NID) and host id (HID) in the IP address 25.193.155.233?

Options :

1. ✗ 24 bit for NID, 8 bits for HID
2. ✔ 8 bit for NID, 24 bits for HID
3. ✗ 16 bit for NID, 16 bits for HID
4. ✗ 2 bit for NID, 8 bits for HID

Question Number : 149 Question Id : 1592075164 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0

___________ is a connection-less and unreliable transport protocol.

Options :

1.
MAC address is a _______ bit number

Options:

1. 24
2. 36
3. 48
4. 42

TCP

IP

UDP

HTTP
The address resolution protocol (ARP) is used for:

Options:

1. Finding the IP address from the DNS

2. Finding the IP address of the default gateway

3. Finding the IP address that corresponds to a MAC address

4. Finding the MAC address that corresponds to an IP address

Packets of the same session may be routed through different paths in:

Options:

1. TCP, but not UDP

2. TCP and UDP
3. ⬤ UDP, but not TCP

Neither TCP nor UDP

4. ⬤

The topology that uses a single cable to connect the network nodes is

Options:

1. Bus
2. Ring
3. Star
4. Mesh
The unix command that prints newline, word count and byte counts of each file is

Options :

1. *

2. *

3. *

4. ✓

The unix command that prints lines matching a pattern is

Options :

1. ✓

2. *

3. *

4.
Question Number : 156 Question Id : 1592075171 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Which of the following types of operating system service keeps track of which users use how much and what kinds of computer resources?

Options :

1. User Interface

2. Program Execution

3. Resource Allocation

4. Accounting

Question Number : 157 Question Id : 1592075172 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

_________ provide an interface to the services made available by an operating system.

Options :

1.
Protection and Security

System Calls

Communications

I/O Operations

Question Number : 158 Question Id : 1592075173 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

The processes that are residing in main memory and are ready and waiting to execute are kept on a list called the ________.

Options:

1. Job Queue
2. Device Queue
3. Ready Queue
4. Pool Queue
Consider the table given below and find the average waiting time result for Non-preemptive SJF scheduling algorithm.

<table>
<thead>
<tr>
<th>Process</th>
<th>Arrival Time</th>
<th>Burst Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>P2</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>P3</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>P4</td>
<td>3</td>
<td>5</td>
</tr>
</tbody>
</table>

Options:

1. 7.75 ms  ✓
2. 6.5 ms  ✗
3. 6.26 ms  ✗
4. 7.38 ms  ✗
When only a single resource of each type is available, the deadlock can be detected by using variation of resource allocation graph. This variation can be constructed by eliminating the resources and collapsing the associated edges. This new variation of resource allocation graph is known as

Options:

1. Planar graph
2. Bounded graph
3. Resource allocation graph
Wait-for-graph

4.  

Question Number : 162 Question Id : 1592075177 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

To get rid of external fragmentation problem, it is desirable to relocate (or shuffle) some or all portions of the memory in order to place all the free holes together at one end of memory to make one large hole. This technique of reforming the storage is termed as________.

Options :

1.  starvation

2.  aging

3.  compaction

4.  swapping

Question Number : 163 Question Id : 1592075178 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0
To determine how demand paging significantly affects the performance of a computer system, we compute the effective access time (EAT) for a demand-paged memory. The effective memory access time can be computed as follows:

[Where \( t_{pfm} \) means page fault handling time, \( ma \) means memory access time and \( p \) means page fault]

Options :

\[
EAT = (1+p) \times ma + p - t_{pfm}
\]

1. ✗

\[
EAT = (1+p) \times ma - p \times t_{pfm}
\]

2. ✗

\[
EAT = (1-p) \times ma + p \times t_{pfm}
\]

3. ✓

\[
EAT = (1.5-p) + ma + p \times t_{pfm}
\]

4. ✗

Question Number : 164 Question Id : 1592075179 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Consider the following page reference string: 1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6 and frame size is three.

How many page faults would occur for the LRU replacement algorithm?

Options :

1. ✓
Question Number : 165 Question Id : 1592075180 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0

Suppose that a disk drive has 5000 cylinders, numbered 0 to 4999. The drive is currently serving a request at cylinder 143, and the previous request was at cylinder 125. The queue of pending requests is: 86, 1470, 913, 1774, 948, 1509, 1022, 1750, 130. Compute the total distance moved in serving all the pending requests as per SCAN disk scheduling algorithm is:

Options :

1. 2419 cylinders

2. 3319 cylinders

3. 9985 cylinders

4. 9769 cylinders
The highest level of data abstraction that describes only a part of entire database is

Options:

1. Physical Level

2. Logical Level

3. View Level

4. Abstract Level

The constraint that specifies the number of entities to which another entity can be associated via a relationship set in E-R model is referred as

Options:

1. Mapping cardinality
An attribute “Address” is divided into Street, City, state, Zip and Country. The attribute “Address” is referred as

Options:

1. Single valued attribute
2. Multivalued attribute
3. Composite attribute
4. Derived attribute
Question Number : 169 Question Id : 1592075184 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0

The relationship associating the weak entity set with the identifying set is called

Options :

1. **Partial entity set**

2. **Identifying relationship**

3. **Aggregation**

4. **IS-A relationship**

---

Question Number : 170 Question Id : 1592075185 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0

The generalization constraint that states that the same entity may belong to more than one lower level entity sets within single generalization is known as

Options :

1. **Overlapping**

2. ****
Disjoint

3. ✗ User-defined

4. ✗ Condition-defined

Question Number: 171 Question Id: 1592075186 Question Type: MCQ Option Shuffling: Yes Display Question Number: Yes Is Question Mandatory: No Calculator: None Response Time: N.A Think Time: N.A Minimum Instruction Time: 0 Correct Marks: 1 Wrong Marks: 0

One of the following operators in SQL is used for pattern matching

Options:

1. ✗ Between

2. ✗ Exists

3. ✔ Like

4. ✗ Average

Question Number: 172 Question Id: 1592075187 Question Type: MCQ Option Shuffling: Yes Display Question Number: Yes Is Question Mandatory: No Calculator: None Response Time: N.A Think Time: N.A Minimum Instruction Time: 0
The set of possible values for a given attribute is said to be its

Options:

1. **Degree**

Cardinality

2. **Cardinality**

Tuple

3. **Tuple**

Domain

4. ✔

The integrity constraints that ensure that a value that appears in one relation for a given set of attributes also appears for a certain attributes of another relation is referred as

Options:

1. **Domain integrity**

Entity integrity

2. **Entity integrity**

3. ✔
Referential integrity

4. ✗

Question Number : 174 Question Id : 1592075189 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

The set of statements that are executed automatically as a side effect of a modification to the database is a

Options :

1. ✗ Function

2. ✗ Procedure

3. ✗ Package

4. ✓ Trigger

Question Number : 175 Question Id : 1592075190 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0
A relation which is in 2nd Normal form and does not contain transitive dependency is in which normal form?

Options:

1. 2NF

2. 3NF

3. 4NF

4. BCNF

How classes and structures in C++ differ

Options:

1. In Structures, members are private by default whereas, in Classes, they are public by default

2. In Structures, members are public by default whereas, in Classes, they are private by default
3. **

Structures by default hide every member whereas classes do not

4. **

Classes cannot have private members whereas Structures can have

**Question Number : 177 Question Id : 1592075192 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Correct Marks : 1 Wrong Marks : 0

Which of the following explains Polymorphism?

Options :

1. **

```c
int abc(int, int); float abc1(float, float);
```

2. **

```c
int abc(int); int abc(int);
```

3. **

```c
int abc(); int new abc();
```

4. ☑

```c
int abc(float); float abc(int, int, char);
```

**Question Number : 178 Question Id : 1592075193 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Correct Marks : 1 Wrong Marks : 0
How do access specifiers in Class help in Abstraction?

Options:

1. They help in keeping things together

2. They do not help in any way

3. Abstraction is used to hide certain functionality

4. Abstraction concept is not used in classes

Which of the following class allows one to declare only one object of it

Options:

1. Abstract class

2. Virtual class

3. Singleton class
4. **Friend class**

Question Number : 180 Question Id : 1592075195 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Which of the following is correct?

Options :

1. Derived class pointer object cannot point to a base class object

2. Base class pointer object cannot point to a derived class object

3. A derived class cannot have pointer objects

4. A base class cannot have pointer objects

Question Number : 181 Question Id : 1592075196 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Out of the following, which is NOT a member of the class

Options :

1. Virtual function
Friend function

Constant function

Static function

Why references are different from pointers

Options:
1. A reference cannot be made null
2. No extra operator is needed for dereferencing of a reference
3. A reference cannot be changed once initialized
4. Pointer is static while reference is dynamic
Which of the following approach is used by C++

Options:

1. ✔ Bottom-up
2. ✗ Top-down
3. ✗ Left-right
4. ✗ Right-left

Which concept is used to implement late binding?

Options:

1. ✔ Virtual functions
2. ✗ Operator functions
3. ✗ Constant functions
Static functions

4. ✗

Question Number : 185 Question Id : 1592075200 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Which one of the following is NOT a possible state for a pointer?

Options :

1. ✗ Holding the address of the specified object

2. ✗ Dangling

3. ✗ Zero

4. ✓ Point to a type

Question Number : 186 Question Id : 1592075201 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0
What is the output of the following code?

```java
int a=23;
char b='y';
system.out.print("b");
system.out.print(a);
```

Options:

1. ×

2. ×

3. ×

4. ✓

Question Number : 187 Question Id : 1592075202 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Find the output of the following code:
```java
public class Solution {
    public static void main(String[] args){
        byte x = 127;
        x++;
        x++;
        x++;
        System.out.print(x);
    }
}
```

Options:
When an array is passed to a method, what does the method receive?

Options:

1. A copy of the array

2. Length of the array

3. A reference of the array

4. Null value
Which is the keyword that makes a variable belong to a class, rather than being defined for each instance of the class.

Options:

1. Static

2. Final

3. Abstract

4. Try

What is the return type of constructor of a class?

Options:

1. int
void

string

No return type

A `throw` statement _________ invokes an exception

Options:

1. Explicitly

2. Implicitly

3. Never

4. Randomly
class Parent {
    final public void display() {
        System.out.println("Parent class display() called");
    }
}

class Child extends Parent {
    public void display() {
        System.out.println("Child class display() called");
    }
}

class Main {
    public static void main(String[] args) {
        Child c = new Child();
        c.display();
    }
}

Options:

1. ** Runtime error
2. ✔ Compiler error
3. ✗ Parent class display() called
4. ✗ Child class display() called

Correct Marks : 1 Wrong Marks : 0
Which of the following is true about interfaces in Java?

Options:

1. An interface can contain following type of members: public, static, final fields (i.e., constants), default and static methods with bodies. ✔

2. An instance of interface can be created. ✗

3. A class can implement multiple interfaces. ✗

4. Many classes can implement the same interface. ✗

Question Number: 194  Question Id: 1592075209  Question Type: MCQ  Option Shuffling: Yes
Display Question Number: Yes  Is Question Mandatory: No  Calculator: None  Response Time: N.A  Think Time: N.A  Minimum Instruction Time: 0
Correct Marks: 1  Wrong Marks: 0

Predict the output of following Java program.

class FORLOOP {
    public static void main(String[] args) {
        for(int i = 0; i < 10; i++)
        {
            System.out.println("Hello");
            break;
        }
    }
}

Options:

1. Hello ✗
Question Number : 195 Question Id : 1592075210 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

The concept of ‘threads’ in Java is used for enabling the entire environment to be ____________

Options :

1. Symmetric

2. Asymmetric

3. Asynchronous

4. Synchronous
In HTML, ______ allows to present document in multiple views.

Options:

1. ✗ Tfoot

2. ✓ Frames

3. ✗ Table

4. ✗ Head

<li> and </li> tags in HTML displays

Options:

1. ✓ Bulleted text on separate line

2. ✗ Circular bullets

3. ✗ Solid round bullets
Squared bullets.

4. ✗

**Question Number : 198** Question Id : 1592075213 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

One of the constants starts with double under score (___) in PHP

Options :

1. ✗

   Default constants

2. ✗

   User defined constants

3. ✗

   Inbuilt constants

4. ✓

   Magic constants

**Question Number : 199** Question Id : 1592075214 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

One of the following is not a feature of JavaScript

Options :

1.
2.

JavaScript is lightweight and cross-platform

2.

JavaScript can handle date and time manipulation

3.

JavaScript can perform form validation

4.✓

Compiler is needed in JavaScript

What will be the output of the following code snippet?

```
<script type="text/javascript" language="javascript">

var a = "Engineering";
var result = a.substring(3, 6);
document.write(result);

</script>
```

Options:

1. ×

   gine

2. ✓

   gin
3. ✗

ine

4. ✔