ADVITIYA ACADEMY OF LEARNING

KARNATAKA DCET 2024

Question Paper & Detailed Solutions

Complete 100 MCQs with Step-by-Step Derivations

Comprehensive solved question paper with authentic official KEA key answers, diagrams, mathematical explanations, and syllabus categorization.

Total Questions: 100 | **Sections:** 5 | **Duration:** 3 Hours

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Prepared by **Advitiya Academy Of Learning**

Validated against Official KEA Key Answers

📋 Table of Contents

Section 1: Engineering Mathematics	Q1 – Q20
Section 2: Statistics & Analytics	Q21 – Q40
Section 3: IT Skills	Q41 – Q60
Section 4: Fundamentals of Electrical & Electronics Engineering	Q61 – Q80
Section 5: Project Management Skills	Q81 – Q100

Section 1: Engineering Mathematics

Q1 – Q20

Q.1 ENGINEERING MATHEMATICS

If $A = \begin{pmatrix} 3 & -2 \\ 4 & 1 \end{pmatrix}$ and $A - B = \begin{pmatrix} 5 & -3 \\ 4 & 6 \end{pmatrix}$, then matrix B is:

(1) $\begin{pmatrix} -3 & 2 \\ -4 & -1 \end{pmatrix}$

(2) $\begin{pmatrix} -5 & 3 \\ -4 & -6 \end{pmatrix}$

(3) ✓ $\begin{pmatrix} -2 & 1 \\ 0 & -5 \end{pmatrix}$

(4) $\begin{pmatrix} 2 & -1 \\ 0 & 5 \end{pmatrix}$

✓ **Answer: Option (3)**

SOLUTION

Explanation: Solve by rearranging the matrix equation: $B = A - (A - B)$.

Step-by-step:

1. Given $A - B = D$ where $D = \begin{pmatrix} 5 & -3 \\ 4 & 6 \end{pmatrix}$.
2. Rearrange the equation to isolate B: $B = A - D$.
3. Substitute the matrices:

$$B = \begin{pmatrix} 3 & -2 \\ 4 & 1 \end{pmatrix} - \begin{pmatrix} 5 & -3 \\ 4 & 6 \end{pmatrix}$$
$$= \begin{pmatrix} 3-5 & -2-(-3) \\ 4-4 & 1-6 \end{pmatrix} = \begin{pmatrix} -2 & 1 \\ 0 & -5 \end{pmatrix}.$$

Q.2 ENGINEERING MATHEMATICS

If $\begin{pmatrix} 3 & -4 \\ 9 & 2 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 10 \\ 2 \end{pmatrix}$, then the values of x and y are:

(1) ✓ $\left(\frac{2}{3}, -2\right)$

(2) $\left(2, \frac{2}{3}\right)$

(3) $\left(-2, \frac{2}{3}\right)$

(4) $\left(-\frac{2}{3}, 2\right)$

✓ Answer: Option (1)

SOLUTION

Explanation: Convert the matrix multiplication to a system of linear equations, then solve for x and y.

Step-by-step:

1. Multiply the matrices to form equations:

$3x - 4y = 10$ --- (i)

$9x + 2y = 2$ --- (ii)

2. Multiply equation (ii) by 2:

$18x + 4y = 4$ --- (iii)

3. Add equation (i) and (iii):

$(3x - 4y) + (18x + 4y) = 10 + 4$

$21x = 14 \implies x = \frac{14}{21} = \frac{2}{3}.$

4. Substitute $x = \frac{2}{3}$ into equation (i):

$3\left(\frac{2}{3}\right) - 4y = 10 \implies 2 - 4y = 10$

$-4y = 8 \implies y = -2.$

5. The solution pair is $\left(\frac{2}{3}, -2\right).$

Q.3 ENGINEERING MATHEMATICS

If $A = \begin{pmatrix} -2 & 6 \\ -2 & 3 \end{pmatrix}$, then A^{-1} is:

(1) $\frac{1}{18}\begin{pmatrix} 3 & -6 \\ 2 & -2 \end{pmatrix}$

(2) ✓ $\frac{1}{6}\begin{pmatrix} 3 & -6 \\ 2 & -2 \end{pmatrix}$

(3) $\begin{pmatrix} 3 & -6 \\ 2 & -2 \end{pmatrix}$

(4) $\frac{1}{6}\begin{pmatrix} -2 & 6 \\ -2 & 3 \end{pmatrix}$

✓ Answer: Option (2)

SOLUTION

Explanation: Apply the 2×2 inverse matrix formula: $A^{-1} = \frac{1}{|A|}\text{adj } A$.

Step-by-step:

1. Find determinant of A:
$|A| = (-2)(3) - (6)(-2) = -6 - (-12) = -6 + 12 = 6.$
2. Find adjoint of A:
$\text{adj } A = \begin{pmatrix} 3 & -6 \\ 2 & -2 \end{pmatrix}.$
3. Calculate the inverse:
$A^{-1} = \frac{1}{|A|}\text{adj } A = \frac{1}{6}\begin{pmatrix} 3 & -6 \\ 2 & -2 \end{pmatrix}.$

Q.4 ENGINEERING MATHEMATICS

If $x + y = 3$ and $2x + 3y = 8$ are linear equations, then x and y are:

(1) $(1, -2)$

(2) ✓ $(1, 2)$

(3) $(-1, -2)$

(4) $(-1, 2)$

✓ Answer: Option (2)

📝 SOLUTION

Explanation: Solve the system of two linear equations simultaneously.

Step-by-step:

1. Equations: $x + y = 3$ --- (i), $2x + 3y = 8$ --- (ii).
2. Multiply equation (i) by 2:
$2x + 2y = 6$ --- (iii).
3. Subtract equation (iii) from (ii):
$(2x + 3y) - (2x + 2y) = 8 - 6 \implies y = 2.$
4. Substitute $y = 2$ in equation (i):
$x + 2 = 3 \implies x = 1.$
5. The values are $x = 1, y = 2.$

Q.5 ENGINEERING MATHEMATICS

If the straight line is $2y = 3x + 4$, then the y-intercept is:

(1) 4

(2) ✓ 2

(3) $\frac{-4}{3}$

(4) -2

✓ Answer: Option (2)

SOLUTION

Explanation: Convert the equation to the standard slope-intercept form $y = mx + c$.

Step-by-step:

1. Given equation: $2y = 3x + 4$.
2. Divide the entire equation by 2 to isolate y:
$y = \frac{3}{2}x + 2$.
3. Compare with $y = mx + c$. Here, $c = 2$.
4. Therefore, the y-intercept is 2.

Q.6 ENGINEERING MATHEMATICS

The acute angle of inclination made by the line $3x - 3y - 2 = 0$ with positive x-axis is:

(1) 135°

(2) 30°

(3) ✓ 45°

(4) 0°

✓ Answer: Option (3)

SOLUTION

Explanation: Find the slope m of the line, then solve for inclination θ using $m = \tan\theta$.

Step-by-step:

1. Express the equation in slope-intercept form:
$3y = 3x - 2 \implies y = 1x - \frac{2}{3}$.
2. The slope is $m = 1$.
3. Use slope definition: $m = \tan\theta = 1$.
4. The acute angle θ is $\tan^{-1}(1) = 45^\circ$.

Q.7 ENGINEERING MATHEMATICS

The slope of a straight line passing through the points $(1, 2)$ and $(5, -3)$ is:

(1) $\frac{5}{4}$

(2) $\frac{1}{6}$

(3) $\frac{-1}{4}$

(4) ✓ $\frac{-5}{4}$

✓ Answer: Option (4)

SOLUTION

Explanation: Use the slope formula: $m = \frac{y_2 - y_1}{x_2 - x_1}$.

Step-by-step:

1. Identify coordinates: $(x_1, y_1) = (1, 2)$ and $(x_2, y_2) = (5, -3)$.
2. Apply formula:

$m = \frac{-3-2}{5-1} = \frac{-5}{4}$.

Q.8 ENGINEERING MATHEMATICS

If the slope of the straight line is $-\frac{3}{2}$ and y-intercept is $\frac{5}{2}$, then the equation of the straight line is:

(1) ✓ $3x + 2y - 5 = 0$

(2) $3x - 2y - 5 = 0$

(3) $3x + 2y + 5 = 0$

(4) $3x - 2y + 5 = 0$

✓ Answer: Option (1)

SOLUTION

Explanation: Substitute the parameters into the slope-intercept form $y = mx + c$ and rearrange.

Step-by-step:

1. Given $m = -\frac{3}{2}$ and $c = \frac{5}{2}$.
2. Substitute into formula:

$y = -\frac{3}{2}x + \frac{5}{2}$.

3. Multiply by 2 to clear fractions:

$2y = -3x + 5$.

4. Rearrange to standard form:

$3x + 2y - 5 = 0$.

Q.9 ENGINEERING MATHEMATICS

The line perpendicular to the straight line $5x - y + 1 = 0$ and passing through the point $(2, 3)$ is:

(1) $x - 5y - 17 = 0$

(2) $x + 5y - 13 = 0$

(3) ✓ $x + 5y - 17 = 0$

(4) $x + 5y + 13 = 0$

✓ Answer: Option (3)

SOLUTION

Explanation: Perpendicular lines have slopes that are negative reciprocals. Find the slope, then use the point-slope form.

Step-by-step:

1. Find slope of given line $5x - y + 1 = 0 \implies y = 5x + 1 \implies m_1 = 5.$
2. Slope of perpendicular line: $m_2 = -\frac{1}{m_1} = -\frac{1}{5}.$
3. Use point-slope form with point $(2, 3)$:

$y - 3 = -\frac{1}{5}(x - 2)$

$5(y - 3) = -(x - 2) \implies 5y - 15 = -x + 2$

$x + 5y - 17 = 0.$

Q.10 ENGINEERING MATHEMATICS

The value of $\cot 660^\circ$ is:

(1) ✓ $\frac{-1}{\sqrt{3}}$

(2) $\sqrt{3}$

(3) $\frac{1}{\sqrt{3}}$

(4) $-\sqrt{3}$

✓ Answer: Option (1)

SOLUTION

Explanation: Reduce the angle using periodicity and quadrant rules.

Step-by-step:

1. Subtract 360° (period of trigonometric functions):
$\cot 660^\circ = \cot(660^\circ - 360^\circ) = \cot 300^\circ$.
2. Express 300° using a standard boundary angle:
$\cot 300^\circ = \cot(270^\circ + 30^\circ)$.
3. Since 300° is in the fourth quadrant, cotangent is negative and changes to tangent:
$\cot(270^\circ + 30^\circ) = -\tan 30^\circ$.
4. Substitute the standard value $\tan 30^\circ = \frac{1}{\sqrt{3}}$:
$= -\frac{1}{\sqrt{3}}$.

Q.11 ENGINEERING MATHEMATICS

The value of $\cos 75^\circ$ is:

(1) $\frac{\sqrt{3}+1}{2\sqrt{2}}$

(2) $\frac{\sqrt{3}+1}{\sqrt{3}-1}$

(3) ✓ $\frac{\sqrt{3}-1}{2\sqrt{2}}$

(4) $\frac{\sqrt{3}-1}{\sqrt{3}+1}$

✓ Answer: Option (3)

SOLUTION

Explanation: Evaluate using the compound angle formula: $\cos(A+B) = \cos A \cos B - \sin A \sin B$.

Step-by-step:

1. Express 75° as a sum of standard angles: $75^\circ = 45^\circ + 30^\circ$.
2. Apply the compound angle formula:
$\cos 75^\circ = \cos(45^\circ + 30^\circ) = \cos 45^\circ \cos 30^\circ - \sin 45^\circ \sin 30^\circ$.
3. Substitute standard values:
$\cos 45^\circ = \frac{1}{\sqrt{2}}$, $\cos 30^\circ = \frac{\sqrt{3}}{2}$, $\sin 45^\circ = \frac{1}{\sqrt{2}}$, $\sin 30^\circ = \frac{1}{2}$.
4. Calculate:
$= \left(\frac{1}{\sqrt{2}}\right)\left(\frac{\sqrt{3}}{2}\right) - \left(\frac{1}{\sqrt{2}}\right)\left(\frac{1}{2}\right) = \frac{\sqrt{3}}{2\sqrt{2}} - \frac{1}{2\sqrt{2}} = \frac{\sqrt{3}-1}{2\sqrt{2}}$.

Q.12 ENGINEERING MATHEMATICS

If a ladder is inclined to the wall with base angle 30^\circ, then the angle in radians is:

(1) $\frac{\pi}{3}$

(2) $\frac{\pi}{4}$

(3) $\frac{\pi}{2}$

(4) ✓ $\frac{\pi}{6}$

✓ Answer: Option (4)

SOLUTION

Explanation: Convert degrees to radians: $\text{Angle in Radians} = \text{Angle in Degrees} \times \frac{\pi}{180}$.

Step-by-step:

1. Given angle: $\theta = 30^\circ$.
2. Apply conversion formula:
$\theta_{\text{rad}} = 30 \times \frac{\pi}{180}$.
3. Simplify the fraction:
$\theta_{\text{rad}} = \frac{\pi}{6}$.

Q.13 ENGINEERING MATHEMATICS

If $\sin A = \frac{3}{5}$ and $\cos B = \frac{12}{13}$, then $\cos(A - B)$ is:

(1) $\frac{-33}{65}$

(2) ✓ $\frac{63}{65}$

(3) $\frac{-63}{65}$

(4) $\frac{33}{65}$

✓ Answer: Option (2)

SOLUTION

Explanation: Find missing sine/cosine values, then apply the compound angle subtraction formula for cosine.

Step-by-step:

1. Find missing values for A: Given $\sin A = 3/5 \implies \cos A = \sqrt{1 - (3/5)^2} = 4/5$.
2. Find missing values for B: Given $\cos B = 12/13 \implies \sin B = \sqrt{1 - (12/13)^2} = 5/13$.
3. Apply formula: $\cos(A - B) = \cos A \cos B + \sin A \sin B$.
4. Substitute and solve:
$= \left(\frac{4}{5}\right)\left(\frac{12}{13}\right) + \left(\frac{3}{5}\right)\left(\frac{5}{13}\right) = \frac{48}{65} + \frac{15}{65} = \frac{63}{65}$.

Q.14 ENGINEERING MATHEMATICS

If $y = 2\sin x - 4\cot x + e^{-x} + 7$, then $\frac{dy}{dx}$ is:

(1) $-2\cos x - 4\csc^2 x - e^{-x} + 7x$

(2) ✓ $2\cos x + 4\csc^2 x - e^{-x}$

(3) $2\cos x + 4\csc^2 x + e^{x} + 7$

(4) $2\sin x - 4\csc^2 x + e^{x}$

✓ Answer: Option (2)

SOLUTION

Explanation: Differentiate term by term using standard formulas.

Step-by-step:

1. Differentiate the first term: $\frac{d}{dx}(2\sin x) = 2\cos x$.
2. Differentiate the second term: $\frac{d}{dx}(-4\cot x) = -4(-\csc^2 x) = 4\csc^2 x$.
3. Differentiate the third term: $\frac{d}{dx}(e^{-x}) = -e^{-x}$.
4. Differentiate the constant term: $\frac{d}{dx}(7) = 0$.
5. Combine the terms: $\frac{dy}{dx} = 2\cos x + 4\csc^2 x - e^{-x}$.

Q.15 ENGINEERING MATHEMATICS

If $y = \left(x + \frac{1}{x}\right)^2$, then $\frac{dy}{dx}$ is:

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

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

(3) ✓ $2x - \frac{2}{x^3}$

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

✓ Answer: Option (3)

SOLUTION

Explanation: Expand the squared expression first, then differentiate term by term.

Step-by-step:

1. Expand the expression:
$y = x^2 + \frac{1}{x^2} + 2(x)\left(\frac{1}{x}\right) = x^2 + x^{-2} + 2$.
2. Differentiate term by term:
$\frac{dy}{dx} = \frac{d}{dx}(x^2) + \frac{d}{dx}(x^{-2}) + \frac{d}{dx}(2)$
$= 2x + (-2)x^{-3} + 0 = 2x - \frac{2}{x^3}$.

Q.16 ENGINEERING MATHEMATICS

If $y = e^{3x} + e^{7x}$, then $\frac{d^2y}{dx^2}$ at $x = 0$ is:

(1) 10

(2) ✓ 58

(3) 1

(4) 2

✓ Answer: Option (2)

SOLUTION

Explanation: Find the second derivative of the function and evaluate it at $x = 0$.

Step-by-step:

1. Find the first derivative $\frac{dy}{dx}$:
$\frac{dy}{dx} = 3e^{3x} + 7e^{7x}$.
2. Find the second derivative $\frac{d^2y}{dx^2}$:
$\frac{d^2y}{dx^2} = 9e^{3x} + 49e^{7x}$.
3. Evaluate at $x = 0$ (Recall $e^0 = 1$):
$\left.\frac{d^2y}{dx^2}\right|_{x=0} = 9e^0 + 49e^0 = 9(1) + 49(1) = 58$.

Q.17 ENGINEERING MATHEMATICS

If $y = \log(\sec x + \tan x)$, then $\frac{dy}{dx}$ is:

(1) $\sec x + \tan x$

(2) $\frac{1}{\sec x + \tan x}$

(3) ✓ $\sec x$

(4) $\sec^2 x$

✓ Answer: Option (3)

SOLUTION

Explanation: Use the chain rule of differentiation: $\frac{d}{dx}(\log u) = \frac{1}{u}\frac{du}{dx}$.

Step-by-step:

1. Let $u = \sec x + \tan x$. The function is $\log u$.
2. Differentiate $\log u$ with respect to x:
$\frac{dy}{dx} = \frac{1}{\sec x + \tan x} \cdot \frac{d}{dx}(\sec x + \tan x)$.
3. Evaluate the derivative of the inner term:
$\frac{d}{dx}(\sec x + \tan x) = \sec x \tan x + \sec^2 x = \sec x(\sec x + \tan x)$.
4. Substitute back and simplify:
$\frac{dy}{dx} = \frac{\sec x(\sec x + \tan x)}{\sec x + \tan x} = \sec x$.

Q.18 ENGINEERING MATHEMATICS

$\int (3x^2+2x+2)^{3/2}(3x+1)\,dx$ is:

(1) $\frac{(3x+5)}{5}+C$

(2) $\left(\frac{3x-5}{5}\right)+C$

(3) $\left(\frac{3x^2-2x-2}{5}\right)^{5/2}+C$

(4) ✓ $\frac{(3x^2+2x+2)^{5/2}}{5}+C$

✓ **Answer: Option (4)**

SOLUTION

Explanation: Solve using integration by substitution: let $u = 3x^2+2x+2$.

Step-by-step:

1. Let $u = 3x^2+2x+2$.
2. Find the differential:
$du = (6x+2)\,dx = 2(3x+1)\,dx \implies \frac{du}{2} = (3x+1)\,dx.$
3. Substitute into the integral:
$\int u^{3/2}\frac{du}{2} = \frac{1}{2}\int u^{3/2}\,du = \frac{1}{2}\cdot\frac{u^{5/2}}{5/2}+C = \frac{1}{2}\cdot\frac{2}{5}u^{5/2}+C = \frac{u^{5/2}}{5}+C.$
4. Substitute back:
$= \frac{(3x^2+2x+2)^{5/2}}{5}+C.$

Q.19 ENGINEERING MATHEMATICS

The integral of $x^3 + \frac{1}{x} + e^x$ is:

(1) $\frac{x^4}{4} + \log x - e^x + C$

(2) ✓ $\frac{x^4}{4} + \log x + e^x + C$

(3) $3x^2 - \frac{1}{x^2} + e^x + C$

(4) $3x^2 - \frac{1}{x^2} - e^x + C$

✓ Answer: Option (2)

SOLUTION

Explanation: Integrate term by term using fundamental integration rules.

Step-by-step:

1. Split the integral:
$\int x^3\,dx + \int \frac{1}{x}\,dx + \int e^x\,dx.$
2. Evaluate each part:
$\int x^3\,dx = \frac{x^4}{4}$
$\int \frac{1}{x}\,dx = \log x$
$\int e^x\,dx = e^x.$
3. Combine and add constant C:
$= \frac{x^4}{4} + \log x + e^x + C.$

Q.20 ENGINEERING MATHEMATICS

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

(1) $x \cos x - \sin x + C$

(2) ✓ $-x \cos x + \sin x + C$

(3) $x \cos x + \sin x + C$

(4) $-x \cos x - \sin x + C$

✓ Answer: Option (2)

SOLUTION

Explanation: Solve using integration by parts: $\int u \, dv = uv - \int v \, du$.

Step-by-step:

1. Let $u = x \implies du = dx$.
2. Let $dv = \sin x \, dx \implies v = -\cos x$.
3. Apply integration by parts:

$\int x \sin x \, dx = (x)(-\cos x) - \int (-\cos x) \, du$

$= -x \cos x + \int \cos x \, dx$

$= -x \cos x + \sin x + C$.

Section 2: Statistics & Analytics

Q21 – Q40

Q.21 STATISTICS & ANALYTICS

Which of the following are not obstacles in project management?

(1) Project complexities

(2) Project risks

(3) Changes in technology

(4) ✓ Early identification ofproblems

✓ Answer: Option (4)

SOLUTION

Explanation: Early identification of problems is the benefit of project management and it is not an obstacle.

> **Step-by-step:**
> Early identification of problems is the benefit of project management and it is not an obstacle.

Q.22 STATISTICS & ANALYTICS

_____ provides guidance as well as direction to the project and he/she is not a part of the project team.

(1) CEO

(2) Project Manager

(3) Team Leader

(4) ✓ Project Consultant

✓ Answer: Option (4)

SOLUTION

Explanation: A Project Consultant is hired from outside to provide expert guidance and advice, but does not form part of the internal project implementation team.

> **Step-by-step:**
> Project consultant guides the project but not a part of the project team.

Q.23 STATISTICS & ANALYTICS

Repair of dam in case of damage due to natural calamities is an example of

(1) Normal project

(2) Crash project

(3) Risky project

(4) ✓ Disaster project

✓ Answer: Option (4)

SOLUTION

Explanation: Project performed due to effect of natural calamities is known as disaster proj ect.

Step-by-step:

Project performed due to effect of natural calamities is known as disaster proj ect.

Q.24 STATISTICS & ANALYTICS

refers to a detailed description of the expected outcome of a project.

(1) Project scope

(2) Project operation

(3) ✓ Project objective

(4) Project process

✓ Answer: Option (3)

SOLUTION

Explanation: Project objective illustrate the tasks you execute to achieve the result.

Step-by-step:

Project objective illustrate the tasks you execute to achieve the result.

Q.25 STATISTICS & ANALYTICS

The process of dividing the project into number of tasks in order to carry out the effective project administration is:

(1) PPM

(2) ✓ WBS

(3) PEP

(4) Project diary

✓ Answer: Option (2)

SOLUTION

Explanation: Work Breakdown Structure (WBS) is the process ofdividing the proj ect work into number oftasks.

> **Step-by-step:**
> Work Breakdown Structure (WBS) is the process ofdividing the proj ect work into number oftasks.

Q.26 STATISTICS & ANALYTICS

The project relieves a project team from most regular work such as planning, tracking and reporting responsibility.

(1) Manager

(2) CEO

(3) ✓ Administration

(4) Leader

✓ Answer: Option (3)

SOLUTION

Explanation: Project administration relieves a project team.

> **Step-by-step:**
> Project administration relieves a project team.

Q.27 STATISTICS & ANALYTICS

The use of authority to channelize the activities of the project on desired lines is referred to as

(1) ✓ Project direction

(2) Project coordination

(3) Project communication

(4) Project execution

✓ Answer: Option (1)

SOLUTION

Explanation: Project direction channelize the activities ofthe project on desired lines.

Step-by-step:

Project direction channelize the activities ofthe project on desired lines.

Q.28 STATISTICS & ANALYTICS

illustrates total project work into divisions of major work packages.

(1) PERT

(2) CPM

(3) ✓ WBS

(4) PEP

✓ Answer: Option (3)

SOLUTION

Explanation: WBS divides the work into major packages DCET - 2024 Question Paper & Solutions

Step-by-step:

WBS divides the work into major packages

Q.29 STATISTICS & ANALYTICS

is a condition wherein a construction or manufacturing project does not complete well within its prescribed time schedule.

(1) Time analysis

(2) Time estimate

(3) ✓ Time overrun

(4) Cost overrun

✓ Answer: Option (3)

SOLUTION

Explanation: Overrun of a time is a condition where project cannot be completed within its prescribed time schedule.

> **Step-by-step:**
> Overrun of a time is a condition where project cannot be completed within its prescribed time schedule.

Q.30 STATISTICS & ANALYTICS

A project creates damages or adverse effects to either project activities or project deliverables.

(1) Failure

(2) Undertaken

(3) ✓ Risk

(4) Analysis

✓ Answer: Option (3)

SOLUTION

Explanation: Damages or uncertainties affects the project is known as risk.

> **Step-by-step:**
> Damages or uncertainties affects the project is known as risk.

Q.31 STATISTICS & ANALYTICS

Identify the correct risk analysis which has typically one variable changed at a time

(1) ✓ Sensitivity Analysis

(2) Scenario Analysis

(3) Best and Worst Case Analysis

(4) Simulation Analysis

✓ Answer: Option (1)

SOLUTION

Explanation: Sensitivity Analysis is a type ofrisk analysis which is done by changing one variable at a time.

Step-by-step:

Sensitivity Analysis is a type ofrisk analysis which is done by changing one variable at a time.

Q.32 STATISTICS & ANALYTICS

Risk usually

(1) Increases as the project progresses

(2) ✓ Reduces

(3) Remains same

(4) Becomes negligible

✓ Answer: Option (2)

SOLUTION

Explanation: As project progress towards goal risk usually reduces.

Step-by-step:

As project progress towards goal risk usually reduces.

Q.33 STATISTICS & ANALYTICS

In 'SMART', the letter R stands for

(1) ✓ Realistic

(2) Reliable

(3) Reasonable

(4) Relation

✓ Answer: Option (1)

SOLUTION

Explanation: The full form 0fSMART. S - Specific M - Measurable A - Achievable R - Realistic T - Timely

> **Step-by-step:**
> The full form 0fSMART. S - Specific M - Measurable A - Achievable R - Realistic T - Timely

Q.34 STATISTICS & ANALYTICS

29 is a step-by-step process of collecting, recording and organising information about project results.

(1) Project planning

(2) ✓ Project evaluation

(3) Project scheduling

(4) Project monitoring

✓ Answer: Option (2)

SOLUTION

Explanation: Project evaluation is a process where information are collected recorded and organised to check about proj ect results.

> **Step-by-step:**
> Project evaluation is a process where information are collected recorded and organised to check about proj ect results.

Q.35 STATISTICS & ANALYTICS

Which one of the following is not a policy of a project?

(1) Extent of work given to outside contractors

(2) Number of contractors to be employed

(3) ✓ Monitoring the progress ofproject

(4) Terms of contract

✓ Answer: Option (3)

SOLUTION

Explanation: Monitoring the progress of project is the phase of project life cycle, not a policy,

Step-by-step:

Monitoring the progress of project is the phase of project life cycle, not a policy,

Q.36 STATISTICS & ANALYTICS

The scheduling, 'EST' stands for:

(1) Easiest Start Time

(2) ✓ Earliest Start Time

(3) Earliest Schedule Time

(4) Earliest Schedule Technique

✓ Answer: Option (2)

SOLUTION

Explanation: EST - Earliest Start Time

Step-by-step:

EST - Earliest Start Time

Q.37 STATISTICS & ANALYTICS

is an expert in measuring, confirming, investigating and reporting status ofa project.

(1) Project Guide

(2) Project Reviewer

(3) ✓ Project Auditor

(4) ProjectAdvisor

✓ Answer: Option (3)

SOLUTION

Explanation: Project Auditor is the one who reports the status ofa project.

Step-by-step:

Project Auditor is the one who reports the status ofa project.

Q.38 STATISTICS & ANALYTICS

is the time estimate if there are no hurdles in an activity.

(1) Pessimistic time

(2) ✓ Optimistic time

(3) Most likely time

(4) Expected estimated time

✓ Answer: Option (2)

SOLUTION

Explanation: Optimistic time is where project time is scheduled based on quickest completion oftime without any risk. 30

Step-by-step:

Optimistic time is where project time is scheduled based on quickest completion oftime without any risk. 30

Q.39 STATISTICS & ANALYTICS

is the last phase of the project life cycle which reports overall achievements ofa project in terms of defined performance measures.

(1) ✓ Project closure

(2) Project initiation

(3) Project execution

(4) Project planning

✓ Answer: Option (1)

SOLUTION

Explanation: Proj ect closure is the final phase ofthe project life cycle.

Step-by-step:

Proj ect closure is the final phase ofthe project life cycle.

Q.40 STATISTICS & ANALYTICS

The objective of network analysis in a project is to

(1) ✓ Minimise total project duration

(2) Minimise total project cost

(3) Minimise production delays

(4) Minimise manpower requirements

✓ Answer: Option (1)

SOLUTION

Explanation: Minimize total project duration is the objective of network analysis.

Step-by-step:

Minimize total project duration is the objective of network analysis.

Section 3: IT Skills

Q41 – Q60

Q.41 IT SKILLS

What is the output of the following? a=10 if (a > 1) then print "TWENTY" else print "TEN"

(1) 10

(2) TEN

(3) ✓ TWENTY

(4) N0 Output

✓ Answer: Option (3)

SOLUTION

Explanation: Assignment: a = 10 This line assigns the value IO to the variable a Conditional statement: if(a > I) then This line starts a conditional statement. The condition being checked is whether the value ofa is greater than 1. In this case, it is (since IO is greater than I). Print statement: print "TWENTY" Ifthe condition is true, this line would print the word "TWENTY" Else statement : else This line indicates the start ofthe else block ofthe conditional statement. Print statement : print "TEN" This line would print the word "TEN" ifthe condition in the ifstatement is not true. Since the value ofa is IO, which is greater than 1, the condition in the if statement is true.

> **Step-by-step:**
> Assignment: a = 10 This line assigns the value IO to the variable a Conditional statement: if(a > I) then This line starts a conditional statement. The condition being checked is whether the value ofa is greater than 1. In this case, it is (since IO is greater than I). Print statement: print "TWENTY" Ifthe condition is true, this line would print the word "TWENTY" Else statement : else This line indicates the start ofthe else block ofthe conditional statement. Print statement : print "TEN" This line would print the word "TEN" ifthe condition in the ifstatement is not true. Since the value ofa is IO, which is greater than 1, the condition in the if statement is true.

Q.42 IT SKILLS

The symbol used to connect two parts ofa big flowchart is

(1) Oval

(2) Rectangle

(3) Diamond

(4) ✓ Circle

✓ Answer: Option (4)

SOLUTION

Explanation: In flowcharts, circles are used as connector symbols to show the continuation of the flow across multiple pages or through a complex chaft.

> **Step-by-step:**
> In flowcharts, circles are used as connector symbols to show the continuation of the flow across multiple pages or through a complex chaft.

Q.43 IT SKILLS

Which symbol is used to represent start or stop in a flowchart?

(1) Rectangle

(2) Diamond

(3) ✓ Oval

(4) Circle

✓ Answer: Option (3)

SOLUTION

Explanation: In standard flowcharting practices, the oval symbol is used to represent the start and end points ofa process

> **Step-by-step:**
> In standard flowcharting practices, the oval symbol is used to represent the start and end points ofa process

Q.44 IT SKILLS

What does CSS stand for?

(1) Colourful Style Sheet

(2) ✓ Cascading Style Sheet

(3) Creative Style Sheet

(4) Computer Style Sheet

✓ Answer: Option (2)

SOLUTION

Explanation: The fullform ofCSS is cascading style sheet

Step-by-step:

The fullform ofCSS is cascading style sheet

Q.45 IT SKILLS

Which of the following is not a web browser?

(1) Google Chrome

(2) Netscape Navigator

(3) Safari

(4) ✓ Apache

✓ Answer: Option (4)

SOLUTION

Explanation: Apache is open-source web server software (HTTP Server), while Google Chrome, Netscape Navigator, and Safari are web browsers.

Step-by-step:

d) Apache Google Chrome: Google Chrome is a popular web browser developed by Google Netscape Navigator: Netscape Navigator was one ofthe first popular web browsers Safari: Safari is a web browser developed by Apple. Apache: Apache is a web server software, not a web browser.

Q.46 IT SKILLS

What is the correct syntax to change the background colour with CSS?

(1) background-color= "purple";

(2) ✓ **background-color : purple;**

(3) background -color = orange

(4) change-background-color : purple DCET - 2024 Question Paper & Solutions

✓ **Answer: Option (2)**

SOLUTION

Explanation: background-color is a property in CSS that specifies the background color of an element. The colon : separates the property name from the value. purple is the value assigned to the property, which in this case sets the background color to purple.

> **Step-by-step:**
> background-color is a property in CSS that specifies the background color of an element. The colon : separates the property name from the value. purple is the value assigned to the property, which in this case sets the background color to purple.

Q.47 IT SKILLS

Which HTML tag gives a scrolling effect of a given text?

(1)

(2) <scroll>

(3) ✓ **<marquee>**

(4) <effect>

✓ **Answer: Option (3)**

SOLUTION

Explanation: The <marquee> tag is an HTML tag that is used to create scrolling text

> **Step-by-step:**
> The <marquee> tag is an HTML tag that is used to create scrolling text

Q.48 IT SKILLS

ERP package will handle functionality / functionalities. business

(1) One

(2) Two

(3) Three

(4) ✓ Multiple

✓ Answer: Option (4)

SOLUTION

Explanation: ERP integrates all the functional unit.

Step-by-step:

ERP integrates all the functional unit.

Q.49 IT SKILLS

Which one is a type oforganizational structure?

(1) Responsibility structure

(2) Behavioural structure

(3) ✓ Functional structure

(4) Relational structure

✓ Answer: Option (3)

SOLUTION

Explanation: Functional structure is a type of organisational structure where it works on the basis offunctional units.

Step-by-step:

Functional structure is a type of organisational structure where it works on the basis offunctional units.

Q.50 IT SKILLS

The _____ describes how an actor uses a system to accomplish a particular goal for describing the activities.

(1) Process case

(2) Work case

(3) ✓ Use case

(4) Sub process

✓ Answer: Option (3)

SOLUTION

Explanation: A Use Case describes the interactions between an external actor and the system to accomplish a specific, meaningful goal.

Step-by-step:
Use case describes how an employee uses a system.

Q.51 IT SKILLS

Which of the following is NOT a characteristic of First-generation ERP system?

(1) They were based on mainframe computer

(2) They focused on accounting and finance

(3) They used centralized database

(4) ✓ They supported real-time data processing

✓ Answer: Option (4)

SOLUTION

Explanation: First-generation ERP systems were legacy mainframe systems focusing on standalone functions with batch processing; real-time data processing was introduced in later generations.

Step-by-step:
1. Early ERPs (1960s-1970s) were MRP and batch accounting tools run on mainframes.
2. Real-time integrated database processing emerged with 2nd and 3rd generation client-server systems (such as SAP R/3).

Q.52 IT SKILLS

Which cloud service model enables users to develop, run, manage application without worrying about underlying infrastructure?

(1) IAAS

(2) ✓ PAAS

(3) SAAS

(4) NAAS

✓ Answer: Option (2)

SOLUTION

Explanation: Platform as a Service (PaaS): PaaS provides a platform for developing, deploying, and managing applications. Users don't have to worry about managing the underlying infrastructure.

> **Step-by-step:**
> Platform as a Service (PaaS): PaaS provides a platform for developing, deploying, and managing applications. Users don't have to worry about managing the underlying infrastructure.

Q.53 IT SKILLS

Which of the following is not a Google application?

(1) Google Docs

(2) Google slides

(3) Google Sheets

(4) ✓ Google Word

✓ Answer: Option (4)

SOLUTION

Explanation: Google Word is not a Google application. The correct name for Google's word processing application is Google Docs

> **Step-by-step:**
> Google Word is not a Google application. The correct name for Google's word processing application is Google Docs

Q.54 IT SKILLS

10T is a

(1) Network of sensors

(2) Network ofobjects in a ring structure

(3) Network of virtual objects

(4) ✓ Network of physical objects embedded with sensors

✓ Answer: Option (4)

SOLUTION

Explanation: IoT refers to the network of physical objects or "things" that are embedded with sensors, software, and other technologies for the purpose of connecting and exchanging data with other devices and systems over the internet.

> **Step-by-step:**
> IoT refers to the network of physical objects or "things" that are embedded with sensors, software, and other technologies for the purpose of connecting and exchanging data with other devices and systems over the internet.

Q.55 IT SKILLS

is a file storage and synchronization service developed by Google which provides complete office tools with cloud storage.

(1) Google Colab

(2) ✓ Google Drive

(3) Google Meet

(4) AWS Cloud 32

✓ Answer: Option (2)

SOLUTION

Explanation: Google Drive is a file storage and synchronization service developed by Google that provides cloud storage, file sharing, and collaborative editing. It integrates with Google's office suite oftools, such as Google Docs, Google Sheets, and Google Slides

> **Step-by-step:**
> Google Drive is a file storage and synchronization service developed by Google that provides cloud storage, file sharing, and collaborative editing. It integrates with Google's office suite oftools, such as Google Docs, Google Sheets, and Google Slides

Q.56 IT SKILLS

Which of the following is not a security issue in a personal computer?

(1) Ransomware Attack

(2) Data Breach

(3) Code Injection

(4) ✓ IoT

✓ Answer: Option (4)

SOLUTION

Explanation: IoT (Internet of Things) refers to a category of connected smart devices, not a security vulnerability or cyber attack mechanism.

Step-by-step:
d) 10T The Internet of Things (IoT) is a network of physical objects that are embedded with sensors, software, and other technologies to connect and exchange data with other devices and systems over the internet.

Q.57 IT SKILLS

Which of the following is not a firewall?

(1) Packet filtering

(2) Stateful inspection

(3) ✓ Panda

(4) Circuit Level Gateway

✓ Answer: Option (3)

SOLUTION

Explanation: Panda Security is a commercial antivirus and endpoint security software company, whereas packet filtering, stateful inspection, and circuit-level gateways are technical classifications of network firewalls.

Step-by-step:
d) Circuit Level Gateway Panda is not a type of firewall; it is a brand name associated with cybersecurity products, including antivirus software. The other options-packet filtering, stateful inspection, and circuit-level gateway-are all types of firewalls.

Q.58 IT SKILLS

"S" in HTTPS stands for

(1) Safe

(2) ✓ Secure

(3) System

(4) Server

✓ Answer: Option (2)

SOLUTION

Explanation: In HTTPS, the "S" stands for Secure. HTTPS is a protocol for secure communication over a computer network.

> **Step-by-step:**
> In HTTPS, the "S" stands for Secure. HTTPS is a protocol for secure communication over a computer network.

Q.59 IT SKILLS

The process used to get an output 43205 from a given input "DCTE" is

(1) ✓ Hashing

(2) Compression

(3) Decompression

(4) Encryption

✓ Answer: Option (1)

SOLUTION

Explanation: Hashing is a process that converts an input ofany size into a fixed-length alphanumeric string. In this case, "DCTE" would be converted into a string of numbers and letters, potentially resulting in something like "43205"..

> **Step-by-step:**
> Hashing is a process that converts an input ofany size into a fixed-length alphanumeric string. In this case, "DCTE" would be converted into a string of numbers and letters, potentially resulting in something like "43205"..

Q.60 IT SKILLS

Given the code snippet:

```
a = 10
b = 20
a = a + b
b = a - b
a = a - b
```

The final values of a and b are:

(1) a = 30, b = 10

(2) a = 30, b = 20

(3) ✓ a = 20, b = 10

(4) a = 20, b = 30

✓ Answer: Option (3)

📝 SOLUTION

Explanation: Tracing step-by-step: 1) a = 10, b = 20. 2) a = 10 + 20 = 30. 3) b = 30 - 20 = 10. 4) a = 30 - 10 = 20. This swaps the two numbers without a temporary variable: a = 20, b = 10.

> **Step-by-step:**
> 1. a = IO: This assigns the value IO to variable a. b 20: This assigns the value 20 to variable b. 2. a a + b: This adds the current value of b (which 3. is 20) to the current value ofa (which is 10) and stores the result back into a. So now, a becomes 30 (10+20). b a - b: This subtracts the current value of b 4. (which is still 20) from the current value ofa (which is now 30) and stores the result back into b. So now, b becomes IO (30 - 20). a a - b: This subtracts the current value of b 5. (which is IO) from the current value ofa (which is still 30) and stores the result back into a. So now, a becomes 20 (30 - 10). Therefore, after all the calculations, a will be 20 and b will be 10.

Section 4: Fundamentals of Electrical & Electronics Engineering

Q61 – Q80

Q.61 FEEE

Which one of the following is not essential for good questionnaires?

(1) Logically arranged

(2) Avoiding personal questions

(3) Limiting number ofquestions

(4) ✓ Unlimited number ofquestions

✓ Answer: Option (4)

SOLUTION

Explanation: Unlimited number ofquestions is not essential for good questionair.

Step-by-step:

Unlimited number ofquestions is not essential for good questionair.

Q.62 FEEE

Both categorical and numerical data variables can be used for

(1) Continuous variable

(2) Class intervals

(3) Distribution offrequency

(4) ✓ Frequency distribution table DCET - 2024 Question Paper & Solutions

✓ Answer: Option (4)

SOLUTION

Explanation: It is used for both categorical and numerical data variable.

Step-by-step:

It is used for both categorical and numerical data variable.

Q.63 FEEE

Match the following Excel functions with their statistical terms:
List - I: (a) Mean, (b) Absolute value, (c) Interquartile range (IQR)
List - II: (i) =Q3 - Q1, (ii) =AVERAGE(array), (iii) =ABS(cell)
Codes:

(1) a - i, b - ii, c - iii

(2) ✓ a - ii, b - iii, c - i

(3) a - iii, b - i, c - ii

(4) a - i, b - iii, c - ii

✓ Answer: Option (2)

SOLUTION

Explanation: In Excel, Mean is computed using =AVERAGE(array), Absolute value uses =ABS(cell), and IQR is the difference between quartiles =Q3 - Q1.

Step-by-step:
1. Mean formula in Excel: =AVERAGE(array) → (ii)
2. Absolute value formula in Excel: =ABS(cell) → (iii)
3. IQR formula: =Q3 - Q1 → (i)
4. Matching sequence: a-ii, b-iii, c-i.

Q.64 FEEE

type of chart is used to show the relationship between numerical and categorical va riable

(1) Plot

(2) Pie

(3) ✓ Bar

(4) Line

✓ Answer: Option (3)

SOLUTION

Explanation: Bar chart is used to show the relationship between numerical and categorical variable.

Step-by-step:
Bar chart is used to show the relationship between numerical and categorical variable.

Q.65 FEEE

Who developed Python language?

(1) Zim Den

(2) ✓ Guido van Rossum

(3) Niene Stom

(4) Wick van Rossum

✓ Answer: Option (2)

SOLUTION

Explanation: Python was conceived and created by Dutch programmer Guido van Rossum and first released in 1991.

> **Step-by-step:**
> Rossum

Q.66 FEEE

Which one of the following is not the benefit of data cleaning?

(1) Removal oferrors when multiple sources ofdata are at play

(2) Boosts results and revenue

(3) Helps with faster decision-making and more efficient business practices

(4) ✓ Consumes more time

✓ Answer: Option (4)

SOLUTION

Explanation: Consuming more time is not the benefit of data cleaning. 33

> **Step-by-step:**
> Consuming more time is not the benefit of data cleaning. 33

Q.67 FEEE

Is Python code complied or interpreted?

(1) ✓ Python code is both complied and interpreted

(2) Python code is neither complied nor interpreted

(3) Python code is only complied

(4) Python code is only interpreted

✓ Answer: Option (1)

SOLUTION

Explanation: Python code is first compiled into bytecode, which is an intermediate form that is not human-readable. This bytecode is then interpreted by the Python virtual machine (PVM) to execute the program.

> **Step-by-step:**
> Python code is first compiled into bytecode, which is an intermediate form that is not human-readable. This bytecode is then interpreted by the Python virtual machine (PVM) to execute the program.

Q.68 FEEE

Which one of the following is not a type of interview?

(1) Unstructured

(2) Semi-structured

(3) ✓ Audio recorder

(4) Structured

✓ Answer: Option (3)

SOLUTION

Explanation: Audio recorder is not a type of interview.

> **Step-by-step:**
> Audio recorder is not a type of interview.

Q.69 FEEE

The time, in seconds, taken by 180 athletes to run a 110 m hurdle race are tabulated below: Class 13.8 to 14 14 to 14.2 14.2 14.4 14.4 to 14.6 to 14.8 14.8 to 15 Frequency 2 4 15 74 36 49 The number of athletes who completed the race in less than 14.6 seconds is:

(1) 19

(2) ✓ 95

(3) 131

(4) 180

✓ Answer: Option (2)

SOLUTION

Explanation: The number of athletes who completed the race in less than 14.6 seconds is 2+4+ 15 + 74 95

Step-by-step:

The number of athletes who completed the race in less than 14.6 seconds is 2+4+ 15 + 74 95

Q.70 FEEE

The higher value of the range represents

(1) ✓ greater spread of the Data

(2) lesser spread of the Data

(3) equal to range ofthe Data

(4) average ofthe Data

✓ Answer: Option (1)

SOLUTION

Explanation: If range ofthe data is more then spread of data is also more. 34

Step-by-step:

If range ofthe data is more then spread of data is also more. 34

Q.71 FEEE

The middle number in a given data set is called:

(1) Mean

(2) Mode

(3) Frequency

(4) ✓ Median

✓ Answer: Option (4)

SOLUTION

Explanation: Median is the middle most value in arrange data.

Step-by-step:

Median is the middle most value in arrange data.

Q.72 FEEE

_____ is the example of qualitative Data.

(1) Temperature

(2) ✓ Ability of students

(3) Prices

(4) Area

✓ Answer: Option (2)

SOLUTION

Explanation: Qualitative data is descriptive and non-numerical. 'Ability of students' is subjective and qualitative, whereas temperature, prices, and area are quantitative.

Step-by-step:

It is a qualitative data

Q.73 FEEE

Direct personal observation is a method of collection of:

(1) Secondary Data

(2) ✓ Primary Data

(3) Mixed Data

(4) Unpublished Data

✓ Answer: Option (2)

SOLUTION

Explanation: Direct personal observation is one type or method of collection of primary data.

Step-by-step:

Direct personal observation is one type or method of collection of primary data.

Q.74 FEEE

The in-built function to find the mean of a given data in Excel is:

(1) ✓ =AVERAGE()

(2) =MEAN()

(3) =MEDIAN()

(4) =MODE()

✓ Answer: Option (1)

SOLUTION

Explanation: In Microsoft Excel, the arithmetic mean is calculated using the formula =AVERAGE(range).

Step-by-step:

Excel formula for mean is Average()

Q.75 FEEE

The formula for Relative Frequency is:

(1) Frequency x No. ofobservations No. of observations

(2) Frequency Frequency

(3) ✓ No. of observations

(4) No. ofobservations + Frequency

✓ Answer: Option (3)

SOLUTION

Explanation: Relative frequency formula is R.f= f/n

Step-by-step:

Relative frequency formula is R.f= f/n

Q.76 FEEE

In Python, "str" is a:

(1) Numeric type

(2) Binary type

(3) ✓ Text type

(4) Sequence type

✓ Answer: Option (3)

SOLUTION

Explanation: • Numeric type refers to data that represents numbers, such as integers or floating-point numbers. • Binary type stores data in binary format (0s and Is). • Text type (or string type) is used for textual data, like words or sentences. • Sequence type refers to an ordered collection of items, such as lists or tuples.

Step-by-step:

• Numeric type refers to data that represents numbers, such as integers or floating-point numbers. • Binary type stores data in binary format (0s and Is). • Text type (or string type) is used for textual data, like words or sentences. • Sequence type refers to an ordered collection of items, such as lists or tuples.

Q.77 FEEE

The results of Python program get displayed in

(1) IDLE3.1.9Window

(2) IELDshe113.9.1 Window

(3) ✓ IDLEshe113.9.1 Window

(4) ILDEshe113.1.9Window

✓ Answer: Option (3)

SOLUTION

Explanation: IDLE (Integrated Development and Learning Environment) is an integrated development environment for Python.

> **Step-by-step:**
> IDLE (Integrated Development and Learning Environment) is an integrated development environment for Python.

Q.78 FEEE

The process of Data cleaning is

(1) Removing virus

(2) ✓ Deduplication

(3) Survey

(4) Google form

✓ Answer: Option (2)

SOLUTION

Explanation: Data cleaning involves identifying and eliminating duplicate records, inaccurate entries, and inconsistencies—commonly termed deduplication.

> **Step-by-step:**
> d) Google form The process ofdata cleaning is removing duplicate data. :. Itis called deduplication.

Q.79 FEEE

Data collected for the first time is called:

(1) Published Data

(2) Mixed Data

(3) ✓ Primary Data

(4) Secondary Data

✓ Answer: Option (3)

SOLUTION

Explanation: The data collected for the first time directly from field by investigator is called primary data.

Step-by-step:

The data collected for the first time directly from field by investigator is called primary data.

Q.80 FEEE

The Excel formula for standard deviation of a sample is:

(1) STDEV.P

(2) SDTEV.S

(3) ✓ STDEV.S

(4) SDTEV.P

✓ Answer: Option (3)

SOLUTION

Explanation: In Excel, STDEV.S calculates sample standard deviation (dividing by n-1), whereas STDEV.P calculates population standard deviation (dividing by N).

Step-by-step:

Excel formula for calculating standard deviation 0fa sample = STDEV.S

Section 5: Project Management Skills

Q81 – Q100

Q.81 PROJECT MANAGEMENT SKILLS

CPR stands for

(1) Cardio Permanent Respiration

(2) Cardio Pulmonary Respiration

(3) ✓ Cardio Pulmonary Resuscitation

(4) Cardio Pulmonary Retrieval

✓ Answer: Option (3)

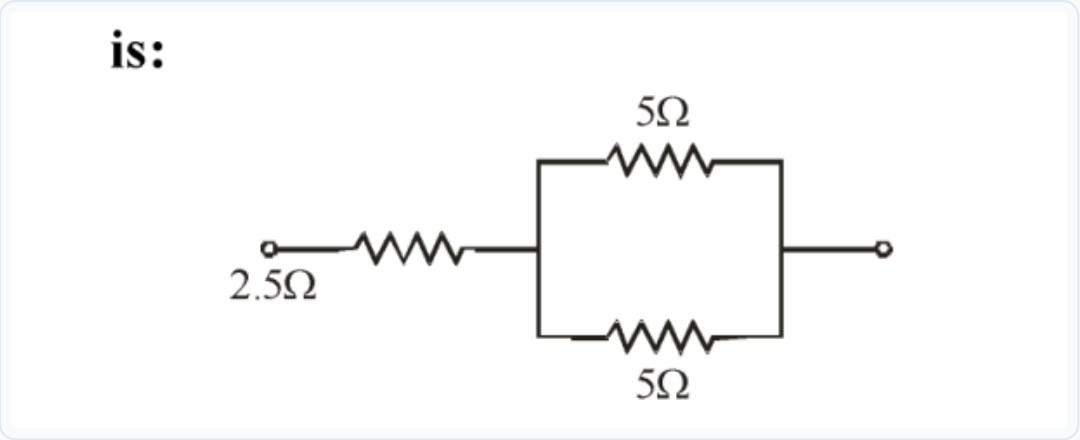
📝 SOLUTION

Explanation: Explanation : CPR stands for Cardio Pulmonary Resuscitation.

> **Step-by-step:**
> Explanation : CPR stands for Cardio Pulmonary Resuscitation.

Q.82 PROJECT MANAGEMENT SKILLS

The effective resistance of the circuit below is:



(1) 0.50 Ω

(2) ✓ 5.0 Ω

(3) 2.50 Ω

(4) 7.50 Ω

✓ Answer: Option (2)

📝 SOLUTION

Explanation: From the circuit diagram, two 5 Ω resistors are connected in parallel, which are in series with a 2.5 Ω resistor. $R_{parallel} = \frac{5\times5}{5+5} = 2.5\,\Omega$. Total resistance $R_T = 2.5 + 2.5 = 5.0\,\Omega$.

Step-by-step:

1. Calculate parallel combination: $R_p = \frac{5\times5}{5+5} = \frac{25}{10} = 2.5\,\Omega$.
2. Add the series resistor: $R_{total} = R_s + R_p = 2.5 + 2.5 = 5.0\,\Omega$.

Q.83 PROJECT MANAGEMENT SKILLS

The relationship between Voltage (V), Current (I) and Resistance (R) is:

(1) I = VR

(2) R = VI

(3) ✓ V = IR

(4) V = I^2R

✓ Answer: Option (3)

SOLUTION

Explanation: According to Ohm's Law, the potential difference across a conductor is proportional to current: V = I × R.

> **Step-by-step:**
> b) R=VI d) V=FR Explanation : According to ohm's law statement, V=I.R The ohm's law V = IR describes, the relation between voltages (VO, Current (I) and Resistance (R). 35

Q.84 PROJECT MANAGEMENT SKILLS

ELCB stands for:

(1) Earth Line Circuit Breaker

(2) Electric Load Circuit Breaker

(3) ✓ Earth Leakage Circuit Breaker

(4) Electric Line Circuit Breaker

✓ Answer: Option (3)

SOLUTION

Explanation: Explanation : ELCB stands for Earth leakage circuit breaker.

> **Step-by-step:**
> Explanation : ELCB stands for Earth leakage circuit breaker.

Q.85 PROJECT MANAGEMENT SKILLS

Good fuse wire must have:

(1) ✓ Low melting point

(2) High melting point

(3) High resistivity

(4) High melting point and high resistivity

✓ Answer: Option (1)

SOLUTION

Explanation: Explanation : A good fuse wire must have low melting point.

Step-by-step:

Explanation : A good fuse wire must have low melting point.

Q.86 PROJECT MANAGEMENT SKILLS

A 10 HP submersible pump set is used in a borewell for irrigation purpose. It normally uses type of motor.

(1) Single-phase induction motor

(2) ✓ Three-phase induction motor

(3) DC motor

(4) FHP motor

✓ Answer: Option (2)

SOLUTION

Explanation: Explanation : A Three phase Induction motor is used in a borewell for irrigation purpose with a 10 HP submerise pump set.

Step-by-step:

Explanation : A Three phase Induction motor is used in a borewell for irrigation purpose with a 10 HP submerise pump set.

Q.87 PROJECT MANAGEMENT SKILLS

SMF in batteries stands for:

(1) Sealed Moulded - Free

(2) Semiconductor Maintenance -Free

(3) ✓ Sealed Maintenance - Free

(4) Solar Maintenance - Free

✓ Answer: Option (3)

SOLUTION

Explanation: Explanation : SMF batteries stands for Sealed Maintenance Free batteries.

Step-by-step:

Explanation : SMF batteries stands for Sealed Maintenance Free batteries.

Q.88 PROJECT MANAGEMENT SKILLS

The typical use of LVDT is to sense

(1) Light intensity

(2) Humidity

(3) ✓ Pressure

(4) Temperature 36

✓ Answer: Option (3)

SOLUTION

Explanation: Explanation : LVDT sensor is used to sense Displacement, Force and Pressure.

Step-by-step:

Explanation : LVDT sensor is used to sense Displacement, Force and Pressure.

Q.89 PROJECT MANAGEMENT SKILLS

A p-n junction diode is a

(1) Bidirectional switch

(2) ✓ Unidirectional switch

(3) Bidirectional Controlled Switch

(4) Unidirectional Controlled Switch

✓ Answer: Option (2)

SOLUTION

Explanation: Explanation : A P-N junction diode is a unidirectional switch. It allows the flow of current in only one direction i.e., From Anode to Cathode terminal.

Step-by-step:
Explanation : A P-N junction diode is a unidirectional switch. It allows the flow of current in only one direction i.e., From Anode to Cathode terminal.

Q.90 PROJECT MANAGEMENT SKILLS

The purpose of C Filter in a power supply is to

(1) Degrade regulation

(2) ✓ Reduce ripple

(3) Reduce gain

(4) Reduce the change ofan electric shock

✓ Answer: Option (2)

SOLUTION

Explanation: Explanation : The purpose ofC Filter in a power supply is used to decrease unwanted ripple voltage. In a rectifier the C filter is connected in parallel with the load.

Step-by-step:
Explanation : The purpose ofC Filter in a power supply is used to decrease unwanted ripple voltage. In a rectifier the C filter is connected in parallel with the load.

Q.91 PROJECT MANAGEMENT SKILLS

Lead acid cell is an example of

(1) ✓ Secondary cell

(2) Solar cell

(3) Primary cell

(4) Fuel cell

✓ Answer: Option (1)

SOLUTION

Explanation: A secondary cell is an electrochemical cell that can be electrically recharged by passing current in the reverse direction. Lead-acid is a classic secondary cell.

> **Step-by-step:**
> Explanation : A secondary cell is a cell that is designed to be recharged with electricity and reused many times. Ex : Lead-Acid, Nickel Cadmium, Lithium ion.

Q.92 PROJECT MANAGEMENT SKILLS

Time taken by the alternating quantity to complete one cycle is called

(1) Frequency

(2) ✓ Time period

(3) Amplitude

(4) Wavelength

✓ Answer: Option (2)

SOLUTION

Explanation: Explanation : The time taken by an alternating quantity to complete one cycle is called Time period. Voltage (v) Time (s) Time period

> **Step-by-step:**
> Explanation : The time taken by an alternating quantity to complete one cycle is called Time period. Voltage (v) Time (s) Time period

Q.93 PROJECT MANAGEMENT SKILLS

What does "PLC" stand for in the context of Industrial Automation?

(1) Programmable Logic Circuit

(2) Process Logic Controller

(3) ✓ Programmable Logic Controller

(4) Processor Logic Controller

✓ Answer: Option (3)

SOLUTION

Explanation: Explanation : PLC stands for Programmable Logic Controller which is used for Industrial Automation.

Step-by-step:

Explanation : PLC stands for Programmable Logic Controller which is used for Industrial Automation.

Q.94 PROJECT MANAGEMENT SKILLS

Maximum value attained by the alternating quantity either in positive half-cycle or negative half-cycle is called

(1) Frequency

(2) Altitude

(3) ✓ Amplitude

(4) Wavelength

✓ Answer: Option (3)

SOLUTION

Explanation: Amplitude (peak value, Vm or Im) is the maximum instantaneous displacement of an alternating quantity from its zero reference axis.

Step-by-step:

Explanation : Amplitude is the maximum value attained by the Alternating quantity either in positive (or) Negative Half cycle of the waveform Amplitude x

Q.95 PROJECT MANAGEMENT SKILLS

Which of the following statement is correct?

(1) In series circuitthe currentthrough each resistor is different

(2) ✓ In parallel circuit the voltage across each resistor is same

(3) In parallel circuitthe equivalent resistance is sum ofindividual residences

(4) In series circuit the reciprocal of equivalent resistance is sum of reciprocal of individual resistances

✓ Answer: Option (2)

SOLUTION

Explanation: Explanation : The voltage value should be same (or) equal (or) remains constant in the parallel circuit.

Step-by-step:
Explanation : The voltage value should be same (or) equal (or) remains constant in the parallel circuit.

Q.96 PROJECT MANAGEMENT SKILLS

The cell which cannot be recharged and reused is

(1) Secondary cell

(2) Battery

(3) ✓ Primary cell

(4) Simple cell

✓ Answer: Option (3)

SOLUTION

Explanation: A primary cell produces current through an irreversible chemical reaction and therefore cannot be recharged once exhausted.

Step-by-step:
A primary cell is a cell that is designed to be used once and discarded and not recharged with electricity and can not reused like a secondary cell.

Q.97 PROJECT MANAGEMENT SKILLS

Specific gravity of a fully charged lead acid battery will be in the range of

(1) 1000 to 1210

(2) 1100 to 1310

(3) 1150 to 1310

(4) ✓ 1230 to 1300

✓ Answer: Option (4)

SOLUTION

Explanation: A fully charged lead-acid battery typically has an electrolyte specific gravity between 1.230 and 1.280 (1230 to 1280, within the 1230 to 1300 range).

Step-by-step:

Explanation : Specific gravity ofa fully charged lead acid battery will be in the range of 1230 to 1280.

Q.98 PROJECT MANAGEMENT SKILLS

The best sensor for sensing vibration is

(1) Themistor

(2) Thermocouple

(3) ✓ Piezoelectric crystal

(4) Hygrometer 37

✓ Answer: Option (3)

SOLUTION

Explanation: The piezo electric crystal sensor is used for sensing vibration of an object.

Step-by-step:

The piezo electric crystal sensor is used for sensing vibration of an object.

Q.99 PROJECT MANAGEMENT SKILLS

During charging of batteries

(1) Chemical energy is converted to Mechanical energy

(2) Mechanical energy is converted to Chemical energy

(3) ✓ Electrical energy is converted to Chemical energy

(4) Chemical energy is converted to Electrical energy

✓ Answer: Option (3)

SOLUTION

Explanation: Explanation : During charging of a batteries, Electrical energy is converted to chemical energy.

Step-by-step:
Explanation : During charging of a batteries, Electrical energy is converted to chemical energy.

Q.100 PROJECT MANAGEMENT SKILLS

When an electric stove is connected across 230 volts, 50 Hz AC supply for the duration of one hour and takes a current of 10 amperes, the energy consumed is:

(1) 230 units

(2) ✓ 2.3 units

(3) 23 units

(4) 0.23 units

✓ Answer: Option (2)

SOLUTION

Explanation: Given: Current $I = 10\ \text{A}$, Voltage $V = 230\ \text{V}$, Time $t = 1\ \text{hour}$. Power $P = V \times I = 230 \times 10 = 2300\ \text{W} = 2.3\ \text{kW}$. Energy consumed in 1 hour = $2.3\ \text{kW} \times 1\ \text{h} = 2.3\ \text{kWh} = 2.3\ \text{units}$.

Step-by-step:
1. Electrical Power: $P = V \times I = 230\ \text{V} \times 10\ \text{A} = 2300\ \text{W}$.
2. Power in kilowatts: $P = \frac{2300}{1000} = 2.3\ \text{kW}$.
3. Energy Consumed in 1 hr: $E = P \times t = 2.3\ \text{kW} \times 1\ \text{h} = 2.3\ \text{kWh}$ (units).
Therefore, Energy consumed = 2.3 units.

Answer Key

Quick Reference – All 100 Questions

Q.No	Ans	Q.No	Ans	Q.No	Ans	Q.No	Ans	Q.No	Ans
1	(3)	21	(4)	41	(3)	61	(4)	81	(3)
2	(1)	22	(4)	42	(4)	62	(4)	82	(2)
3	(2)	23	(4)	43	(3)	63	(2)	83	(3)
4	(2)	24	(3)	44	(2)	64	(3)	84	(3)
5	(2)	25	(2)	45	(4)	65	(2)	85	(1)
6	(3)	26	(3)	46	(2)	66	(4)	86	(2)
7	(4)	27	(1)	47	(3)	67	(1)	87	(3)
8	(1)	28	(3)	48	(4)	68	(3)	88	(3)
9	(3)	29	(3)	49	(3)	69	(2)	89	(2)
10	(1)	30	(3)	50	(3)	70	(1)	90	(2)
11	(3)	31	(1)	51	(4)	71	(4)	91	(1)
12	(4)	32	(2)	52	(2)	72	(2)	92	(2)
13	(2)	33	(1)	53	(4)	73	(2)	93	(3)
14	(2)	34	(2)	54	(4)	74	(1)	94	(3)
15	(3)	35	(3)	55	(2)	75	(3)	95	(2)
16	(2)	36	(2)	56	(4)	76	(3)	96	(3)
17	(3)	37	(3)	57	(3)	77	(3)	97	(4)
18	(4)	38	(2)	58	(2)	78	(2)	98	(3)
19	(2)	39	(1)	59	(1)	79	(3)	99	(3)
20	(2)	40	(1)	60	(3)	80	(3)	100	(2)

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