GUJCET 2026 Mathematics Question Paper

Time Allowed :1 Hour	Maximum Marks :40	Total Questions :40

General Instructions

Read the following instructions carefully and follow them:

1. This question paper contains **40 questions**. All questions are compulsory.
2. All questions are **Multiple Choice Questions (MCQs)** with four options (A, B, C, D).
3. Each question carries **1 mark**.
4. There is a **negative marking of 0.25 marks** for each incorrect answer.
5. Use only **blue or black ball pen** to fill the OMR sheet.
6. Fill the bubbles completely and correctly. **Do not tick or circle** the answers.
7. Multiple responses for a single question will be treated as **incorrect**.
8. Rough work should be done only in the space provided in the question paper.
9. **No electronic devices** such as calculators, mobile phones, or smart watches are allowed.
10. Candidates must carry their **admit card and valid ID proof**.
11. Reach the examination center **at least 30 minutes before** the scheduled time.
12. Manage your time wisely. Attempt easy questions first and avoid blind guessing.
13. Recheck your answers in the last few minutes before submission.

1. $\int \sec^2 x \cdot \csc^2 x \, dx = \_\_\_\_\_ + C$

(A) $\tan x + \cot x$

(B) $\tan x \cdot \cot x$

(C) $\tan x - \cot x$

(D) $\tan x - \cot 2x$

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2. $\int \frac{dx}{\sqrt{9x-4x^2}} = \_\_\_\_\_ + C$

(A) $\frac{1}{9}\sin^{-1}\left(\frac{9x-8}{8}\right)$

(B) $\frac{1}{3}\sin^{-1}\left(\frac{9x-8}{8}\right)$

(C) $\frac{1}{2}\sin^{-1}\left(\frac{8x-9}{9}\right)$

(D) $\frac{1}{2}\sin^{-1}\left(\frac{9x-8}{9}\right)$

3. $\int_0^{\pi} \left(\sin^2 \frac{x}{2} - \cos^2 \frac{x}{2}\right) dx =$ _____
(A) 0
(B) -1
(C) 1
(D) 2

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4. $\int_{\frac{\pi}{4}}^{\frac{\pi}{2}} \frac{dx}{1+\cot x} =$ _____
(A) $\frac{\pi}{6}$
(B) 0
(C) $\frac{\pi}{12}$
(D) 1

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5. $\int e^x \left(\frac{1-x}{1+x^2}\right)^2 dx =$ _____ $+ C$
(A) $\frac{e^x}{1+x^2}$
(B) $\frac{e^x}{(1+x^2)^2}$
(C) $\frac{e^x}{1+x^2}$
(D) $\frac{e^x}{1+x}$

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6. $\int \frac{e^{2025x}+e^{-2025x}}{e^{2025x}+e^{-2025x}} dx =$ _____ $+ C$
(A) $e \log|e^x + e^{-x}|$
(B) $\frac{1}{e} \log|e^x + e^{-x}|$
(C) $\log|e^x + e^{-x}|$
(D) $-\frac{1}{e} \log|e^x + e^{-x}|$

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7. Area lying in the first quadrant and bounded by ellipse $4x^2 + 9y^2 = 144$ **is** _____
(A) 24π
(B) 8π
(C) 12π
(D) 6π

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8. The area bounded by the curve $y = x|x|$**, X-axis and the ordinates** $x = -1$ **and** $x = 1$ **is** _____
(A) 0
(B) $\frac{2}{3}$
(C) $\frac{1}{3}$
(D) $\frac{4}{3}$

9. The order and the degree of the differential equation

$$\sqrt{1+\left(\frac{d^2y}{dx^2}\right)^2}=\sqrt{x+\left(\frac{dy}{dx}\right)^6}$$

are respectively _____ and _____

(A) 2, 3
(B) 1, 6
(C) 3, 2
(D) 2, 6

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10. The number of arbitrary constants in the particular solution of a differential equation of third order are _____

(A) 3
(B) 1
(C) 2
(D) 0

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11. The general solution of the differential equation $\frac{dy}{dx}=e^{x+y}$ is _____

(A) $e^x+e^{-y}=C$
(B) $e^{-x}+e^y=C$
(C) $e^x+e^y=C$
(D) $e^{-x}+e^{-y}=C$

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12. If two vectors $\vec{a}$ and $\vec{b}$ are such that $|\vec{a}|=2, |\vec{b}|=3$ and $\vec{a}\cdot\vec{b}=4$, then $|\vec{a}-\vec{b}|=$ _____

(A) $\sqrt{5}$
(B) 13
(C) 5
(D) $\sqrt{17}$

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13. The area of the triangle with vertices $A(1,1,2), B(2,3,5)$ and $C(1,5,5)$ is _____

(A) $\sqrt{43}$
(B) $\frac{\sqrt{43}}{2}$
(C) $\sqrt{61}$
(D) $\frac{\sqrt{61}}{2}$

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14. The value of $\hat{i}\cdot(\hat{k}\times\hat{j})+\hat{j}\cdot(\hat{k}\times\hat{i})+\hat{k}\cdot(\hat{j}\times\hat{i})$ is _____

(A) 0

(B) 1
(C) -1
(D) 3

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15. The angle between the pair of lines given by

$$\vec{r} = 3\hat{i} + 2\hat{j} - 4\hat{k} + \lambda(\hat{i} + 2\hat{j} + 2\hat{k})$$

and

$$\vec{r} = 5\hat{i} - 2\hat{j} + \mu(3\hat{i} + 2\hat{j} + 6\hat{k})$$

is _____
(A) $\cos^{-1}\left(\frac{19}{21}\right)$
(B) $\sin^{-1}\left(\frac{19}{21}\right)$
(C) $\cos^{-1}\left(-\frac{19}{21}\right)$
(D) $\cos^{-1}\left(\frac{\sqrt{19}}{21}\right)$

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16. If the lines

$$\frac{1-x}{3} = \frac{7y-14}{2p} = \frac{3-z}{-2}$$

and

$$\frac{7-7x}{3p} = \frac{y-5}{1} = \frac{6-z}{5}$$

are perpendicular, then the value of p is _____
(A) $\frac{11}{70}$
(B) $\frac{70}{11}$
(C) $\frac{35}{11}$
(D) $-\frac{70}{11}$

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17. The vector equation of the line passing through the point $(1, 2, -4)$ and perpendicular to the two lines

$$\frac{x-8}{3} = \frac{y+19}{-16} = \frac{z-10}{7}$$

and

$$\frac{x-15}{3} = \frac{y-29}{8} = \frac{z-5}{-5}$$

is _____
(A) $\vec{r} = \hat{i} + 2\hat{j} - 4\hat{k} + \lambda(2\hat{i} - 3\hat{j} + 6\hat{k})$
(B) $\vec{r} = \hat{i} + 2\hat{j} - 4\hat{k} + \lambda(2\hat{i} + 3\hat{j} + 6\hat{k})$
(C) $\vec{r} = \hat{i} + 2\hat{j} - 4\hat{k} + \lambda(2\hat{i} + 3\hat{j} - 6\hat{k})$
(D) $\vec{r} = \hat{i} + 2\hat{j} - 4\hat{k} + \lambda(2\hat{i} - 3\hat{j} - 6\hat{k})$

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18. The coordinates of the corner points of the bounded feasible region are $(0, 10), (5, 5), (15, 15), (0, 20)$. The minimum of the objective function $z = 3x + 9y$ is _____
(A) 180
(B) 30
(C) 90
(D) 60

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19. For linear programming problem, the objective function is $z = px + qy$, $p, q > 0$. If at the corner points $(0, 10)$ and $(5, 5)$, the value of z are 90 and 60 respectively, then the relation between p and q is _____
(A) $p = 3q$
(B) $q = 2p$
(C) $q = 3p$
(D) $p = 2q$

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20. Let A and B be two events such that $P(A) = \frac{5}{11},\ P(B) = \frac{2}{11}$ and $P(A \cup B) = \frac{3}{11}$, then $P(A'|B') =$ _____
(A) $\frac{8}{9}$
(B) $\frac{3}{5}$
(C) $\frac{1}{2}$
(D) $\frac{2}{9}$

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21. If A and B are any two events such that $P(A) + P(B) - P(AandB) = P(A)$, then _____
(A) $P(B|A') = 1$
(B) $P(B|A) = 0$
(C) $P(A|B) = 1$
(D) $P(A|B) = 0$

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22. Three cards are drawn successively, without replacement from a pack of 52 well shuffled cards. The probability that first two cards are kings and the third card drawn is an ace is _____
(A) $\frac{1}{135200}$
(B) $\frac{2}{55225}$
(C) $\frac{3}{55225}$
(D) $\frac{3}{135200}$

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23. Let R be the relation in the set $\mathbb{N}$ given by $R = \{(a, b) : a = b - 2,\ b < 6\}$, then _____

(A) $(6,8) \in R$
(B) $(8,7) \in R$
(C) $(8,3) \in R$
(D) $(2,4) \in R$

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24. Let $f : \mathbb{N} \to \mathbb{N}$ be defined by

$$f(n) = \begin{cases} \frac{n+1}{2}, & \textbf{if } n \textbf{ is odd} \\ \frac{n}{2}, & \textbf{if } n \textbf{ is even} \end{cases}$$

for all $n \in \mathbb{N}$. Then f is _____
(A) One-one and onto
(B) Many-one and onto
(C) One-one but not onto
(D) Neither one-one nor onto

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25. If $\cos^{-1} x = y$, then _____
(A) $0 \leq y \leq \pi$
(B) $0 < y < \pi$
(C) $-\frac{\pi}{2} \leq y \leq \frac{\pi}{2}$
(D) $-\frac{\pi}{2} < y < \frac{\pi}{2}$

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26. $\sin^{-1}\left(\sin \frac{3\pi}{5}\right) =$ _____
(A) $\frac{\pi}{5}$
(B) $\frac{3\pi}{5}$
(C) $\frac{2\pi}{5}$
(D) $\frac{4\pi}{5}$

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27. $\tan^{-1}\left[2\cos\left(2\sin^{-1}\frac{1}{2}\right)\right] =$ _____
(A) $\frac{\pi}{4}$
(B) $\frac{3\pi}{4}$
(C) $-\frac{\pi}{4}$
(D) $-\frac{3\pi}{4}$

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28. If $A = \begin{bmatrix} a & b \\ c & -a \end{bmatrix}$ is such that $A^2 = I$, then _____
(A) $1 + a^2 + bc = 0$
(B) $1 - a^2 - bc = 0$
(C) $1 - a^2 + bc = 0$
(D) $1 + a^2 - bc = 0$

29. If A and B are skew-symmetric matrices of same order, then $AB - BA$ is a _____
(A) Skew symmetric matrix
(B) Zero matrix
(C) Symmetric matrix
(D) Identity matrix

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30. If $A = \begin{bmatrix} 3 & -2 \\ 4 & -2 \end{bmatrix}$, then $A^2 + I =$ _____
(A) $A - 2I$
(B) $A + I$
(C) $A - I$
(D) $I - A$

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31. If area of triangle is 35 sq. units with vertices $(2, -6), (5, 4)$ and $(k, 4)$, then k is _____
(A) 12
(B) $-12, -2$
(C) -2
(D) $12, -2$

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32. If

$$A = \begin{bmatrix} 2 & 0 & 0 \\ 0 & 3 & 0 \\ 0 & 0 & 4 \end{bmatrix} \quad \textbf{and} \quad B = \begin{bmatrix} 1 & 0 & 0 \\ 0 & -2 & 0 \\ 0 & 0 & -3 \end{bmatrix}$$

then $A^2 + B^2 =$ _____
(A) $\begin{bmatrix} 5 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & 7 \end{bmatrix}$
(B) $\begin{bmatrix} 3 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$
(C) $\begin{bmatrix} 5 & 0 & 0 \\ 0 & 13 & 0 \\ 0 & 0 & 25 \end{bmatrix}$
(D) $\begin{bmatrix} 3 & 0 & 0 \\ 0 & 5 & 0 \\ 0 & 0 & 7 \end{bmatrix}$

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33. If inverse matrix of $A = \begin{bmatrix} 2 & 3 \\ 1 & -4 \end{bmatrix}$ is $A^{-1} = \begin{bmatrix} a & \frac{3}{11} \\ \frac{1}{11} & b \end{bmatrix}$, then $a + b =$ _____

$(A) \frac{2}{11}$
(B) $\frac{6}{11}$
(C) $-\frac{2}{11}$
(D) $-\frac{6}{11}$

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34. If function f is continuous at point $x = \pi$ and

$$f(x) = \begin{cases} kx + 1, & x \leq \pi \\ \cos x, & x > \pi \end{cases}$$

then the value of k is _____
(A) $\frac{2}{\pi}$
(B) $-\frac{2}{\pi}$
(C) $\frac{1}{\pi}$
(D) 0

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35. If $x = at^2,\ y = 2at$, then $\frac{d^2y}{dx^2} =$ _____
(A) $\frac{a}{xy}$
(B) $\frac{ax}{y}$
(C) $-\frac{a}{xy}$
(D) $-\frac{ax}{y}$

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36. If $y = \log_{2026}(\log_{2025} x)$, then $\frac{dy}{dx} =$ _____
(A) $\frac{1}{x \log x \log 2025}$
(B) $\frac{1}{x \log x \log 2026}$
(C) $\frac{1}{2025x \log x}$
(D) $\frac{1}{2026x \log x}$

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37. If $e^y(x + 1) = 1$, then $\frac{d^2y}{dx^2} - \left(\frac{dy}{dx}\right)^2 =$ _____
(A) e^y
(B) $\frac{1}{x+1}$
(C) $-\frac{1}{x+1}$
(D) 0

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38. The total revenue in Rupees received from the sale of x units of a product is given by $R(x) = 3x^2 + 36x + 5$. The marginal revenue, when $x = 15$, is _____

(A) 116
(B) 90
(C) 96
(D) 126

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39. The maximum value of the function $f(x) = -|x+1| + 3,\ x \in \mathbb{R}$ is _____
(A) 2
(B) 3
(C) -2
(D) 4

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40. The interval in which $y = x^2 e^x$ is decreasing is _____
(A) $(-\infty, \infty)$
(B) $(2, \infty)$
(C) $(-2, 0)$
(D) $(0, 2)$
