

Ph.D. ENTRANCE EXAMINATION, August-2026

Name of Candidate Answer Sheet No.

Roll No. of the Candidate Signature of the Candidate.....

Date of Examination Signature of the Invigilator(s)

1.

2.

Time: 2 Hours**Maximum Marks: 100****IMPORTANT INSTRUCTIONS**

- i. The question paper is in the form of Test-Booklet containing **100 (Hundred)** questions. Each question may carry maximum four answer marked. (A), (B), (C) and (D) out of which only one is correct.
- ii. There are 100 multiple choice questions, each question carrying 1 mark. The test includes 50 questions of Research Methodology (Part A) and 50 questions of the subject/Domain (Part B).
- iii. On receipt of the Test-Booklet (Question Paper), the candidate should immediately check it and ensure that it contains all the pages, i.e., **100** questions (50 in Part-A+50 in Part-B). Discrepancy, if any, should be reported by the candidate to the invigilator immediately after receiving the Test-Booklet.
- iv. A separate Answer- Sheet is provided with the Test-Booklet/Question Paper. On this sheet there are 100 rows containing four circles each. One row pertains to one question.
- v. The candidate should write his/her roll number at the places provided on the cover page of the Test-Booklet/ Question Paper and on Answer Sheet and NOWHERE ELSE.
- vi. No second test -Booklet /Question Paper and Answer -Sheet will be given to a candidate. The candidates are advised to be careful in handling it and writing the answer on the Answer-Sheet.
- vii. For every correct answer of the question **One (1) mark will be awarded**. For every unattempted question/ wrong answer, zero (0) mark shall be awarded. **There is no Negative Marking**.
- viii. Marking shall be done only on the basis of answers responded on the Answer- Sheet.
- ix. To mark the answer on the Answer- Sheet, candidate should **darken** the appropriate circle in the row of each question with Blue or Black pen.
- x. For each question, only one circle should be darkened as a mark of the answer adopted by the candidate. If more than one circle for the question are found darkened or with one black circle any other circle carries any mark, the question will be treated as cancelled.
- xi. The candidates should not remove any paper from the Test- Booklet/Question Paper. Attempting to remove any paper shall be liable to be punished for use of unfair means.
- xii. Rough work may be done on the blank space provided in the Test- Booklet /Question Paper only.
- xiii. Mobile phones (even in Switch -off mode) and such other communication/ programmable devices are not allowed inside the examination hall.
- xiv. No candidate shall be permitted to leave the examination hall before the expiry of the time.

DO NOT OPEN THIS QUESTION BOOKLET UNTIL ASKED TO DO SO

(PART-A)

1. Which of the following statements is true about the collection of data?
 - a. The data that is collected from the place of origin is known as primary data
 - b. The data that is collected from the place of origin is known as secondary data
 - c. The data that is collected from the place of origin is known as tertiary data
 - d. None of the above
2. Which of the following is the main point of difference between primary data and secondary data?
 - a. The collection of secondary data is costlier and more time consuming when compared to primary data
 - b. The secondary data is always original whereas the primary data is not
 - c. The primary data is much more reliable than secondary data because it is collected directly from respondents
 - d. None of the above
3. Which of the following is an example of qualitative data?
 - a. Temperature readings in Celsius
 - b. Monthly income in dollars
 - c. Transcript of an interview
 - d. Total population count
4. How is qualitative data usually analyzed?
 - a) By using statistical formulas and graphs
 - b) By finding themes, patterns, and categories
 - c) By running computer software for percentages
 - d) By measuring numerical weight or length
5. Which graph is used to show cumulative frequency?
 - a) Bar graph
 - b) Ogive
 - c) Histogram
 - d) Pie chart
6. Which chart is most suitable to show the comparison of parts to a whole?
 - a) Line graph
 - b) Histogram
 - c) Frequency polygon
 - d) Pie chart
7. In a moderately asymmetrical (skewed) distribution, what is the empirical relationship between mean, median, and mode?
 - a. $\text{Mean} - \text{Mode} = 3(\text{Mean} - \text{Median})$
 - b. $\text{Mean} = \text{Median} + \text{Mode}$
 - c. $\text{Mode} = 3\text{Mean} - 2\text{Median}$
 - d. $\text{Median} = \text{Mean} / \text{Mode}$
8. Which measure of central tendency includes the magnitude of scores?
 - a. Mean
 - b. Mode
 - c. Median

- d. Range
9. What is the mean of the following numbers: 23, 45, 87, 40, 50?
- 59
 - 49
 - 56
 - 39
10. Which of the following are methods under measures of dispersion?
- Standard deviation
 - Mean deviation
 - Range
 - All of the above
11. _____ and _____ are types of measures of dispersion.
- Nominal, Real
 - Nominal, Relative
 - Absolute, Relative
 - Real, Relative
12. The standard deviation of a set of 90 observations is 105. If the value of each observation is decreased by 9, then the new standard deviation of these observations would be _____.
- 96
 - 105
 - 100
 - None of the above
13. The average of squared deviations from the arithmetic mean is known as _____.
- Quartile deviation
 - Standard deviation
 - Variance
 - None of the above
14. If Mohan secures 97 percentiles in an examination, it means that his position is below _____ of the total candidates who had appeared in the exam.
- 97 percent
 - 3 percent
 - 90 percent
 - None of the above
15. Which of the following cannot be calculated for open-ended distributions?
- Standard deviation
 - Mean deviation
 - Range
 - None of the above
16. The interquartile range (IQR) is calculated as:
- $Q3 - Q1$
 - $Q3 + Q1$
 - $Q1 - Q3$
 - $Q1 \times Q3$
17. Which of the following statements is TRUE?

- a. Standard deviation is less reliable than range.
 - b. Mean deviation uses all scores.
 - c. Quartile deviation uses the entire dataset.
 - d. Range uses all scores.
18. If range is 20 and the smallest value is 5, the largest value is:
- a. 25
 - b. 15
 - c. 30
 - d. Cannot be determined
19. A distribution with low variability is considered:
- a. Scattered
 - b. Skewed
 - c. Consistent
 - d. Unreliable
20. Coefficient of variation is helpful in:
- a. Finding mode
 - b. Comparing variability between two datasets
 - c. Identifying mean
 - d. Finding median
21. If the variance is 16, then the standard deviation is:
- a. 8
 - b. 4
 - c. 2
 - d. 16
22. Kurtosis is a measure of:
- a. Central tendency
 - b. Dispersion
 - c. Symmetry
 - d. Skewness
23. Choose the correct option concerning the correlation analysis between 2 sets of data.
- a. Multiple correlations is a correlational analysis comparing two sets of data.
 - b. A partial correlation is a correlational analysis comparing two sets of data.
 - c. A simple correlation is a correlational analysis comparing two sets of data.
 - d. None of the preceding.
24. Which one of the below statements regarding the regression line is correct?
- a. The prediction equation is another name for a regression line.
 - b. A regression line is also referred to as the line of the average relationship.
 - c. The estimating equation is another name for a regression line.
 - d. All of the above.
25. Who introduced the term 'regression'?
- a. Karl Pearson
 - b. R.A Fischer
 - c. Croxton and Cowden
 - d. Francis Galton.

26. Company A produces 10% defective products, Company B produces 20% defective products and C produces 5% defective products. If choosing a company is an equally likely event, then find the probability that the product chosen is defective.
- 0.12
 - 0.21
 - 0.22
 - 0.11
27. A well-defined research problem helps the researcher most by:
- Determining the exact budget
 - Guiding the selection of the research design and methods
 - Eliminating the need for a literature review
 - Guaranteeing publication in a journal
28. Why is a literature review critical during problem formulation?
- It proves that your bias is correct
 - It helps reveal gaps and inconsistencies in existing knowledge
 - It provides unrelated background facts
 - It replaces the need to state research objectives
29. Which of the following statement is correct?
- Reliability ensures the validity
 - Validity ensures reliability
 - Reliability and validity are independent of each other
 - Reliability does not depend on objectivity
30. The study in which the investigators attempt to trace an effect is known as:
- Survey Research
 - Summative Research
 - Historical Research
 - 'Ex-post Facto' Research
31. Generalized conclusion on the basis of a sample is technically known as:
- Data analysis and interpretation
 - Parameter inference
 - Statistical inference
 - All of the above
32. Authenticity of a research finding is its:
- Originality
 - Validity
 - Objectivity
 - All of the above
33. Which technique is generally followed when the population is finite?
- Area Sampling Technique
 - Purposive Sampling Technique
 - Systematic Sampling Technique
 - None of the above
34. Research problem is selected from the stand point of:
- Researcher's interest
 - Social relevance

- c. Financial support
 - d. Availability of relevant literature
35. The research is always –
- a. Verifying the old knowledge
 - b. Exploring new knowledge
 - c. Filling the gap between knowledge
 - d. All of these
36. Manipulation of independent variable is always a part of
- a. Historical research
 - b. Fundamental research
 - c. Descriptive research
 - d. Experimental research
37. The Factorial Analysis is used:
- a. To know the relationship between two variables
 - b. To know the difference among the many variables
 - c. To know the difference between two variables
 - d. To test the Hypothesis
38. Which of the following is classified in the category of the developmental research?
- a. Philosophical research
 - b. Action research
 - c. Descriptive research
 - d. All the above
39. What is the name of the conceptual framework in which the research is carried out?
- a. Research hypothesis
 - b. Research design
 - c. Research paradigm
 - d. Synopsis of Research
40. Which of the following features are considered as critical in qualitative research?
- a. Collecting data with the help of standardized research tools.
 - b. Design sampling with probability sample techniques.
 - c. Collecting data with bottom-up empirical evidence.
 - d. Gathering data with top-down schematic evidence.
41. Tippit table refers to as _____
- a. Table of random digits
 - b. The table used in sampling methods
 - c. The table used in statistical investigations
 - d. All of the above
42. What are the conditions in which Type-I error occurs?
- a. The null hypotheses get accepted even if it is false
 - b. The null hypotheses get rejected even if it is true
 - c. Both the null hypotheses as well as alternative hypotheses are rejected
 - d. None of the above

43. Research and Development become the index of development of the country. Which of the following reasons are true with regards to this statement?
- R&D targets human development
 - R&D can enhance people's standard of living in the country
 - R&D reflects the actual economic and social conditions being prevailed in the country
 - All the above
44. What is the main aim of interdisciplinary research?
- To over simplify the problem of research
 - To bring out the holistic approach to research
 - To create a new trend in research methodology
 - To reduce the emphasis on a single subject in the research domain
45. A researcher is interested in studying the prospects of a particular political party in an urban area. So, what tool should he prefer for the study?
- Rating Scale
 - Interview
 - Questionnaire
 - Schedule
46. The conclusions/findings of which type of research cannot be generalized to other situations?
- Casual Comparative Research
 - Historical Research
 - Descriptive Research
 - Experimental Research
47. Which one is called non-probability sampling?
- Quota sampling
 - Cluster sampling
 - Systematic sampling
 - Stratified random sampling
48. What are the core elements of a dissertation?
- Introduction; Data Collection; Data Analysis; Conclusions and Recommendations
 - Executive Summary; Literature Review; Data Gathered; Conclusions; Bibliography
 - Research Plan; Research Data; Analysis; References
 - Introduction; Literature Review; Research Methodology; Results; Discussions and Conclusions
49. The "Sociogram" technique is used to study _____
- Vocational Interest
 - Human Relations
 - Professional Competence
 - Achievement Motivation
50. Action-research can be understood as _____
- A longitudinal research
 - An applied research
 - A kind of research being carried out to solve a specific problem
 - All of the above

(PART-B)

51. Let X be a connected subset of real numbers. If every element of X is irrational, then the cardinality of X is
 (a) *Infinite* (b) *Countably Infinite* (c) 2 (d) 1
52. Using Cayley Hamilton theorem find A^8 , if $A = \begin{bmatrix} 1 & 2 \\ 2 & -1 \end{bmatrix}$
 (a) $625I$ (b) $525I$ (c) $725I$ (d) $825I$
53. Let A be a closed subset of R . $A \neq \emptyset$ and $A \neq R$. Then A is
 (a) the closure of the interior of A (b) a countable set
 (c) a compact set (d) not open
54. The number of surjective maps from a set of 4 elements to a set of 3 elements is
 (a) 36 (b) 64
 (c) 69 (d) 81
55. Consider the interval $(-1, 1)$ and a sequence $\{a_n\}$ of elements in it. Then,
 (a) Every limit point of $\{a_n\}$ is in $(-1, 1)$
 (b) Every limit point of $\{a_n\}$ is in $[-1, 1]$
 (c) The limit points of $\{a_n\}$ can only be in $\{-1, 0, 1\}$
 (d) The limit points of $\{a_n\}$ cannot be in $\{-1, 0, 1\}$
56. Let $f: R \rightarrow R$ be a strictly increasing continuous function. If $\{a_n\}$ is a sequence in $[0, 1]$, then the sequence $f\{a_n\}$ is
 (a) increasing (b) bounded
 (c) convergent (d) not necessarily bounded
57. Which one of the following statements is true for the series $\sum_1^\infty (-1)^n \frac{(2n)!}{n^{2n}}$?
 (a) The series converges conditionally but not absolutely
 (b) The series converges absolutely
 (c) The sequence of partial sums of the series is bounded but not convergent
 (d) The sequence of partial sums of the series is unbounded
58. Let $p(x)$ be a polynomial in the real variable x of degree 5. Then $\lim_{n \rightarrow \infty} \frac{p(n)}{2^n}$ is
 (a) 5 (b) 1 (c) 0 (d) ∞
59. Let S be a nonempty subset of R . If S is a finite union of disjoint bounded intervals, then which one of the following is true?
 (a) If S is not compact, then $\sup S \notin S$ and $\inf S \notin S$
 (b) Even if $\sup S \in S$ and $\inf S \in S$, S need not be compact
 (c) If $\sup S \in S$ and $\inf S \in S$, then S is compact
 (d) Even if S is compact, it is not necessary that $\sup S \in S$ and $\inf S \in S$
60. Which of the following functions is uniformly continuous on the interval $(0, \infty)$?

(a) $f(x) = \frac{1}{x}$

(b) $f(x) = x^2$

(c) $f(x) = \sqrt{x}$

(d) $f(x) = \ln(x)$

61. The improper integral: $\int_1^\infty \frac{1}{x^{p+1}} dx$ where p is a real number converges for?

(a) $p > 1$

(b) $p \geq 1$

(c) $p > 0$

(d) $p \leq 1$

62. For $n \geq 1$, let $f_n(x) = xe^{-nx^2}$, $x \in R$. Then the sequence $\{f_n(x)\}$ is

(a) uniformly convergent on R (b) uniformly convergent only on compact subsets of R (c) bounded and not uniformly convergent on R

(d) a sequence of unbounded functions

63. The value of integral $\int_1^4 [\log x] dx$ where $[]$ denotes greatest integer

(a) $\log 4$

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

(c) $4 - e$

(d) $4 + e$

64. Consider the improper Riemann integral $\int_0^x \frac{1}{\sqrt{y}} dy$. This integral is:

(a) Continuous in $[0, \infty)$ (b) continuous only in $(0, \infty)$ (c) discontinuous in $(0, \infty)$ (d) discontinuous only in $(\frac{1}{2}, \infty)$

65. Let $f: [0,1] \rightarrow (0, \infty)$ be a continuous function. Suppose $f(0) = 1$ and $f(1) = 7$. Then,

(a) f is uniformly continuous and is not onto(b) f is increasing and $f([0,1]) = [1,7]$ (c) f is not uniformly continuous(d) f is not bounded

66. Which of the following statements is true?

(a) There are at most countably many continuous maps from $R^2 \rightarrow R$ (b) There are at most finitely many continuous surjective maps from $R^2 \rightarrow R$ (c) There are infinitely many continuous injective maps from $R^2 \rightarrow R$ (d) There are no continuous bijective maps from $R^2 \rightarrow R$

67. Let X be a metric space and $A \subseteq X$ be a connected set with at least two distinct points. Then the number of distinct points in A is

(a) 2

(b) more than 2 but finite

(c) countably infinite

(d) uncountable

68. Which of the following statements is true regarding the eigenvalues of a square matrix A ?

- (a) The eigenvalues of A are the solutions to the equation $\det(A - xI) = 0$.
- (b) The eigenvalues of A are the solutions to the equation $\det(A) = xI$.
- (c) The eigenvalues of A are the solutions to the equation $\text{tr}(A - xI) = 0$.
- (d) The eigenvalues of A are the solutions to the equation $\text{adj}(A - xI) = 0$.
69. Let M be a real 6×6 matrix. Let 2 and -1 be two eigenvalues of M . If $M^5 = aI + bM$, where $a, b \in \mathbb{R}$, then
- (a) $a = 10, b = 11$ (b) $a = -11, b = 10$
- (c) $a = -10, b = 11$ (d) $a = 10, b = -11$
70. Which of the following statements is true about the rank and nullity of a matrix A of size $m \times n$?
- (a) The rank of A plus the nullity of A equals m .
- (b) The rank of A plus the nullity of A equals n .
- (c) The rank of A is always less than or equal to the nullity of A .
- (d) The nullity of A is always greater than or equal to m .
71. The vectors $u = [3 + \sqrt{2}, 1 + \sqrt{2}]^T$ and $v = [7, 1 + 2\sqrt{2}]^T$ in $\mathbb{R}^2$ are
- (a) L.I. over $\mathbb{R}$ (b) L.I. over $\mathbb{C}$
- (c) L.I. over $\mathbb{Q}$ (d) All of these
72. Let $S = \{(1, 2, 3), (1, 0, -1)\}$. The value of k for which the vector $(2, 1, k)$ belongs to the linear span of S is
- (a) 1 (b) -1 (c) 2 (d) 0
73. Which of the following mapping $\mathbb{R}^2 \rightarrow \mathbb{R}^2$ is not a linear mapping?
- (a) $(x, y) \rightarrow (y, x)$ (b) $(x, y) \rightarrow (x + y, y)$
- (c) $(x, y) \rightarrow (x + 1, y)$ (d) $(x, y) \rightarrow (0, 0)$
74. Let A be a 5×4 matrix with real entries such that $Ax = 0$ if and only if $x = 0$ where x is a 4×1 vector and 0 is null vector. Then, the rank of A is
- (a) 4 (b) 5 (c) 2 (d) 1
75. Let $n > 1$ be a fixed natural number. Which of the following is an inner product on the vector space $n \times n$ real symmetric matrices?
- (a) $\langle A, B \rangle = (\text{trace}(A))(\text{trace}(B))$ (b) $\langle A, B \rangle = \text{trace}(AB)$
- (c) $\langle A, B \rangle = \text{determinant}(AB)$ (d) $\langle A, B \rangle = \text{trace}(A) + \text{trace}(B)$
76. The matrix $\begin{bmatrix} 3 & -1 & 0 \\ -1 & 2 & -1 \\ 0 & -1 & 3 \end{bmatrix}$ is
- (a) positive definite (b) non-negative definite but not positive definite
- (c) negative definite (d) neither negative definite nor positive definite
77. Which of the following is an incorrect statement?

- (a) If $f(z)$ is entire and bounded in a complex plane, then $f(z)$ is constant.
- (b) If $f(z)$ is analytic at z_0 , then $f'(z)$ is also analytic at z_0 .
- (c) Entire function is analytic.
- (d) Analytic function is entire.
78. The fixed points of $f(z) = \frac{2iz+5}{z-2i}$ is
(a) $1 \pm i$ (b) $1 \pm 2i$ (c) $2i \pm 1$ (d) $i \pm 1$
79. The complement of the unit circle $|z| = 1$ is
(a) $|z| > 1$ (b) $|z| < 1$ (c) $|z| = 1$ (d) None of these
80. The value of m so that $2x - x^2 + my^2$ may be harmonic is
(a) 0 (b) 1 (c) 2 (d) 3
81. The radius of convergence of the power series $\sum 5^n z^{3n}$ is
(a) 1 (b) 5 (c) $5^{\frac{1}{3}}$ (d) $5^{-\frac{1}{3}}$
82. A bounded entire function is constant. This statement is
(a) Cauchy's theorem (b) Liouville's theorem
(c) Morera theorem (d) Schwarz lemma
83. Polynomial $f(z)$ of degree n has a pole of order n at
(a) Zero (b) infinity (c) $|z| = 1$ (d) nowhere
84. Which of the following integers is a solution to the congruence $5x \equiv 3 \pmod{7}$?
(a) $x \equiv 1 \pmod{7}$ (b) $x \equiv 2 \pmod{7}$
(c) $x \equiv 3 \pmod{7}$ (d) $x \equiv 4 \pmod{7}$
85. Which one of the following is TRUE?
(a) $\mathbb{Z}_n$ is cyclic if and only if n is prime
(b) Every proper subgroup of $\mathbb{Z}_n$ is cyclic
(c) Every proper subgroup of S_4 is cyclic
(d) If every proper subgroup of a group is cyclic, then the group is cyclic
86. Which of the following sets with the given operations is a ring?
(a) The set of all integers under addition and multiplication
(b) The set of all natural numbers under addition and multiplication
(c) The set of all real numbers under addition and division
(d) The set of all even integers under addition and multiplication
87. Which of the following is a subgroup of the group of integers under addition $(\mathbb{Z}, +)$?
(a) The set of all even integers

- (b) The set of all prime numbers
- (c) The set of all odd integers
- (d) The set of all negative integers
88. The initial value problem $xy'' + y' + xy = 0$; $y(0) = 1, y'(0) = 0$ has
- (a) A unique solution (b) no solution
- (c) infinitely many solutions (d) two L.I. Solutions
89. The singular solution of $y = px - 2p^2$ is
- (a) $x^2 - 8y = 0$ (b) $x^2 + 8y = 0$
- (c) $y^2 - 8x = 0$ (d) $y^2 - 8x = 0$
90. Solution of the differential equation is $y'' + y = \sec(x)$
- (a) $\cos x + b \sin x + x \sin x + \cos \log \cos x$
- (b) $\cos x - b \sin x + x \sin x + \cos \log \cos x$
- (c) $\cos x + b \sin x + x \sin x + \cos \log \sin x$
- (d) $\cos x + b \sin x + x \sin x - \cos \log \cos x$
91. The complete integral of the differential equation $q = (z + px)^2$ is
- (a) $z = ax + \sqrt{ay} + k$ (b) $yz = ax + \sqrt{ay} + k$
- (c) $yz = x + \sqrt{ay} + k$ (d) $yz = ax + \sqrt{y} + k$
92. The solution of the differential equation $(D^2 - DD' - 2D)z = e^{2x+y}$ is
- (a) $z = f_1(y) + e^{2x} f_2(y - x) - \frac{1}{2} e^{2x+y}$
- (b) $z = f_1(y) + e^{2x} f_2(y + x) - \frac{1}{2} e^{2x+y}$
- (c) $z = f_1(y) + e^{2x} f_2(y - x) - \frac{1}{2} e^{2x-y}$
- (d) $z = f_1(x) + e^{2x} f_2(y - x) - \frac{1}{2} e^{2x+y}$
93. Consider the function $f(x) = e^{-x}$ and its Taylor approximation $g(x)$ of degree 3. For $x = \frac{1}{3}$, $g(x)$ is
- (a) Positive and less than 1
- (b) Negative and less than -2
- (c) Positive and greater than 1
- (d) Less than 1 but greater than 0.75
94. Let $f(x) = ax + b$ for $a, b \in R$. Then the iteration $x_{n+1} = f(x_n)$ starting from any given x_0 for any $n \geq 0$ converges
- (a) For all $a \in R$
- (b) For no $a \in R$
- (c) For $a \in [0, 1)$
- (d) Only for $a = 0$
95. Using Simpson's $\frac{1}{3}$ rule with $h = \frac{1}{4}$, the value of the integral $\int_0^{\frac{1}{2}} \frac{x}{\sin x} dx$ is

- (a) 0.51 (b) 1.51 (c) 2.51 (d) 3.51

96. The variational problem of extremizing the functional has

$$I(y(x)) = \int_0^{2\pi} [(y')^2 - y^2] dx; y(0) = 1, y(2\pi) = 1$$

- (a) A unique solution
(b) Exactly two solutions
(c) An infinite number of solutions
(d) No solution

97. Which of the following functions is solution of the Fredholm integral equation,

$$\varphi(x) + \int_0^1 x(e^{xt} - 1)\varphi(t)dt = e^x - x$$

- (a) x (b) $1 + x$ (c) 1 (d) -1

98. Which of the following functions is solution of the Volterra integral equation $\int_0^x e^{x-t}u(t)dt = x$?

- (a) $1 + x$ (b) $1 - x$ (c) $x - 1$ (d) 1

99. The total number of vibrational degrees of freedom of a molecule containing n collinear atoms is

- (a) $3n - 6$ (b) $3n - 5$ (c) $3n - 2$ (d) $3n$

100. A force $5\hat{i} - 2\hat{j} + 3\hat{k}$ acts on a particle with position vector $2\hat{i} + \hat{j} - 2\hat{k}$. The torque of the force about the origin is

- (a) $\hat{i} + 16\hat{j} + 9\hat{k}$
(b) $-\hat{i} - 16\hat{j} - 9\hat{k}$
(c) $\hat{i} + 16\hat{j} - 9\hat{k}$
(d) $\hat{i} - 16\hat{j} + 9\hat{k}$

=== END OF PAPER ===

Answer Key of Research Methodology

- 1. a**
- 2. c**
- 3. c**
- 4. b**
- 5. b**
- 6. d**
- 7. a**
- 8. a**
- 9. b**
- 10. d**
- 11. c**
- 12. b**
- 13. c**
- 14. b**
- 15. b**
- 16. a**
- 17. b**
- 18. a**
- 19. c**
- 20. b**
- 21. b**
- 22. d**
- 23. c**
- 24. d**
- 25. d**

- 26. a**
- 27. b**
- 28. b**
- 29. c**
- 30. d**
- 31. a**
- 32. c**
- 33. c**
- 34. b**
- 35. d**
- 36. d**
- 37. b**
- 38. d**
- 39. b**
- 40. c**
- 41. d**
- 42. b**
- 43. d**
- 44. b**
- 45. c**
- 46. b**
- 47. a**
- 48. d**
- 49. b**
- 50. c**

Shri Vishwakarma Skill University
Ph.D. Entrance Exam (Mathematics)
Ans Key

Q.No	Ans	Q.No.	Ans
51	D	76	A
52	A	77	D
53	D	78	C
54	A	79	D
55	B	80	B
56	B	81	C
57	B	82	B
58	C	83	B
59	A	84	B
60	C	85	A
61	C	86	A
62	A	87	A
63	C	88	B
64	A	89	A
65	A	90	A
66	D	91	B
67	D	92	B
68	A	93	A
69	A	94	C
70	B	95	A
71	C	96	B
72	D	97	C
73	C	98	B
74	A	99	B
75	B	100	B