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P. G. Re Entrance Examination, 2026
MATHEMATICS
Subject Code : 58796

Day and Date : Wednesday, 07-Oct-2026

Total Marks : 100

Time : 01.00 pm to 03.00 pm

Instructions:

- 1) All questions are compulsory.
 - 2) Each question carries 2 marks.
 - 3) Answers should be marked in the given OMR answer sheet by darkening the appropriate option.
 - 4) Use black ball point pen only for marking the circle. Do not make any stray mark on the OMR answer sheet.
 - 5) Follow the instructions given on OMR Sheet.
 - 6) Rough work shall be done on the sheet provided at the end of question paper.
 - 7) Only non-programmable calculators are allowed.
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Choose the correct answer

- 1) What is the purpose of a literature review in the research process?
 - A) To summarize the researcher's findings
 - B) To critique other researchers' work
 - C) To provide background information on the topic
 - D) To replace the need for data collection

- 2) What does the term "peer-reviewed journal" mean?
- A) A journal edited by colleagues
 - B) A journal that only publishes positive findings
 - C) A journal with no editorial board
 - D) A journal with biased reviews
- 3) What does the term "sampling" refer to in research?
- A) Collecting data
 - B) Selecting a subset of the population
 - C) Analyzing data
 - D) Presenting findings
- 4) What is the role of a hypothesis in research?
- A) To prove the researcher's point
 - B) To provide a tentative explanation
 - C) To confuse the readers
 - D) To eliminate the need for data collection
- 5) Research is _____
- A) Searching again and again
 - B) Finding solution to any problem
 - C) Working in a scientific way to search for truth
 - D) None of the Above

- 6) What is the initial step in initiating the research process?
- A) Exploring sources of information to identify a problem.
 - B) Reviewing related literature.
 - C) Identifying the problem.
 - D) Exploring solutions to the problem.
- 7) In the series TMP, RKN, PIL, NGJ, ... the missing term is
- a. LFG
 - b. LFH
 - c. LEG
 - d. LEH
- 8) Which of the following will complete the numerical series?
- 56, 280, 1400, 7000, ..., 175000
- a. 30000
 - b. 15000
 - c. 40000
 - d. 35000
- 9) The quality of a research journal is indicated by its.....
- a. h-index
 - b. g-index
 - c. i/o-index
 - d. impact factor
- 10) According to UGC regulations 2018 on plagiarism, level 3 plagiarism refers to similarities
- a. Above 60%
 - b. Below 10%
 - c. Above 10% to 30%
 - d. Above 40% to 60%

- 11) What is the purpose of the ShodhShuddhi initiative?
 - a. Enhance student enrolment
 - b. Provide access to plagiarism detection software
 - c. Promote research funding
 - d. Increase faculty salaries
- 12) According to the UGC guidelines on plagiarism, upto what percentage of similarity of text does not invite penalty?
 - a. 10 percent
 - b. 16 percent
 - c. 25 percent
 - d. 40 percent
- 13) Which of the following is an example of professional writing?
 - a) $\sin^2\theta + \cos^2\theta = 1$
 - b) $\sin^2\theta + \cos^2\theta = 1$
 - c) $\sin^2\theta + \cos^2\theta = 1$
 - d) $\sin^2\theta + \cos^2\theta = 1$
- 14) The "em quad" is the unit to measure _____ in a formula.
 - a) height of a symbol
 - b) font size of a symbol
 - c) blank space between symbols
 - d) the size of the kernel letter
- 15) Non-English words when adopted in English must be in italics and _____ follow the abbreviations.
 - A) full stops
 - B) comma
 - C) colon
 - D) semi-colon

- 16) _____ is used to indicate the end of proof.
- a) Q. E. D.
 - b) "Hence the proof"
 - c) line of length 3 em space
 - d) Halmos box
- 17) Which of the following describes a 'frozen symbol' in mathematical writing?
- a) A symbol that has a fixed meaning in a particular context
 - b) A symbol that is used for only one theorem
 - c) A symbol that can be changed according to the author's need
 - d) A symbol used for temporary assumptions
- 18) Which of the following is an example of professional writing?
- a) Consider the direct sum $A_1 \oplus A_2 \oplus \dots \oplus A_m$
 - b) Let $a_1, a_2, \dots, a_n$ be integers.
 - c) much English mathematical writing is a result of Ramanujan.
 - d) Euler's formula is $1 + 1/2^2 + 1/3^2 + \dots$ to $\infty = \pi^2/6$.
- 19) The LaTeX command `\"o` produces
- a) ö
 - b) ø
 - c) õ
 - d) ô
- 20) The LaTeX command `\textbf{ }` produces:
- a) italic
 - b) small caps
 - c) boldface
 - d) slanted

- 21) Which command is used to write an inline equation in LaTeX?
- (a) \$... \$
 - (b) \[... \]
 - (c) \begin{equation} ... \end{equation}
 - (d) \$\$... \$\$
- 22) Which LaTeX command produces a $\lim_{x \rightarrow 0} f(x)$?
- (a) $\{x \rightarrow 0\} \lim f(x)$
 - (b) $\lim_{\{x \rightarrow 0\}} f(x)$
 - (c) $\lim_{\{x \rightarrow 0\}} f(x)$
 - (d) $f(x)_{\{x \rightarrow 0\}}$
- 23) Which of the following is primarily used to define a function in Scilab?
- a) def
 - b) function
 - c) define
 - d) func
- 24) What command in Scilab generates a 5×5 identity matrix?
- a) identity (5,5)
 - b) eye (5,5)
 - c) ones (5,5)
 - d) unit (5,5)
- 25) In Scilab, what symbol is used for matrix multiplication?
- a) *
 - b) $\times$
 - c) . $\times$
 - d) **

26) Consider the function $f: \mathbb{C} \rightarrow \mathbb{C}$ defined by $f(z) = z^n$ with $n \in \mathbb{Z}$, $n \geq 0$. Then f is:

a) Analytic only on $\mathbb{C} \setminus [0, \infty)$

b) Analytic only on $\mathbb{C} \setminus (-\infty, 0]$

c) Analytic $\mathbb{C}$

d) Nowhere analytic

27) The harmonic conjugate of $u(x, y) = \sin x \cosh y$, $x, y \in \mathbb{R}$ is $u(x, y) = \dots\dots\dots$

a) $\cos x \sinh y$

b) $\cosh x \sin y$

c) $\cosh x \sinh y$

d) $\cos x \sin y$

28) Consider the following two statements:

(I) Let C is the collection of all circular regions (interior of circles) in the plane $\mathbb{R}^2$.

(II) Let B is the collection of all rectangular regions (interior of rectangles) in the plane $\mathbb{R}^2$

Which of the following is true?

a) Only (I) forms a basis for the standard topology on $\mathbb{R}^2$

b) Only (II) forms a basis for the standard topology on $\mathbb{R}^2$

c) Both (I) and (II) form bases for the standard topology on $\mathbb{R}^2$

d) Neither (I) nor (II) form bases for the standard topology on $\mathbb{R}^2$

29) Let X and Y be topological spaces. If each of X and Y is connected and compact, then the product space $X \times Y$ is:

a) Compact but not connected b) Connected but not compact

c) Both connected and compact d) Neither connected nor compact

- 30) If V is of dimension m over F , then $\text{Hom}(V, F)$ is of dimension over F .
- (A) 1 (B) $|F|$
 (C) $|V|$ (D) m
- 31) Let W_1, W_2 be subspaces of V , a finite dimensional vector space over F .
 $A(W_1 + W_2) = \dots\dots\dots$
- (A) $A(W_1 \cup W_2)$ (B) $A(W_1 \cap W_2)$
 (C) $A(W_1) \cap (W_2)$ (D) $A(W_1) \cup (W_2)$
- 32) A vertex of G which is not end of any edge is called vertex:
- (A) isolated (B) zero
 (C) null (D) adjacent
- 33) For any $a, b \in B$ a Boolean algebra, if $a = b$ then we have $(ab' + a'b) = \dots\dots\dots$
- (A) b (B) 1
 (C) a (D) 0
- 34) Let $p_1, p_2, \dots, p_k$ be k distinct primes. Then $\left[Q(\sqrt{p_1}, \sqrt{p_2}, \dots, \sqrt{p_k}) : Q\right] = \dots\dots\dots$
- (A) 2 (B) 2^k
 (C) k (D) infinite
- 35) Let $G = G\left(\frac{C}{R}\right)$ Then $|G| =$
- (A) 2 (B) 1
 (C) infinite (D) prime

36) If $P_2(x) = l_0(x) f(x_0) + l_1(x) f(x_1) + l_2(x) f(x_2)$ is the Lagrange quadratic interpolating polynomial for the function $f(x)$ then..... $= \frac{(x-x_0)(x-x_2)}{(x_1-x_0)(x_1-x_2)}$

(A) $f(x_1)$

(B) $l_3(x)$

(C) $l_1(x)$

(D) $l_2(x)$

37) If $x^{(k+1)} = Hx^{(k)} + c$, $k = 0, 1, 2, \dots$ is the Gauss-Seidal iteration method used to solve the system of n linear algebraic equations $Ax = b$ then $c =$ _____

A) $(L + D)^{-1} b$

B) $D^{-1} b$

C) $-D^{-1} (L + U)$

D) $-(D + L)^{-1} U$

38) Which of the following is the n -th Legendre polynomial?

(A) $P_n(x) = \frac{1}{2^n n!} \frac{d^n}{dx^n} (x^2 - 1)^n$

(B) $P_n(x) = \frac{1}{2^n n!} \frac{d}{dx} (x^2 - 1)^n$

(C) $P_n(x) = \frac{1}{2^n n!} \frac{d^n}{dx^n} (x^2 - 1)^n$

(D) $P_n(x) = \frac{1}{2^n n!} \frac{d^n}{dx^n} (x^2 - 1)$

39) Which of the following is the solution of the initial value problem:
 $y'' - 2y' - 3y = 0$ $y(0) = 0$, $y'(0) = 1$?

(A) $\phi(x) = \frac{1}{4}(e^{-x} - e^{3x})$

(B) $\phi(x) = \frac{1}{4}(e^{-3x} - e^{-x})$

(C) $\phi(x) = \frac{1}{4}(e^{3x} - e^{-x})$

(D) $\phi(x) = \frac{1}{4}(e^{-x} - e^{3x})$

- 40) The integral equation $f(s) = \int_0^1 (s^2 + t^2) f(t) dt$ classified as:
- a) Volterra integral equation of the first kind
 - b) Fredholm integral equation of the first kind
 - c) Fredholm integral equation of the second kind
 - d) Volterra integral equation of the second kind
- 41) If the kernel is given by $k(s, t) = st$ then the kernel is:
- a) Symmetric and separable
 - b) Symmetric only
 - c) Separable only
 - d) Neither symmetric nor separable
- 42) If X is a normed linear space and X^* its dual, then the dual of ℓ_1 is isometrically isomorphic to
- a) ℓ_∞
 - b) ℓ_1
 - c) c_0
 - d) ℓ_2
- 43) The Hahn-Banach Theorem ensures that
- a) Every linear functional can be extended to the whole space without increasing its norm
 - b) Every bounded operator is compact
 - c) Every Banach space is reflexive
 - d) Every Hilbert space is separable

- 44) A function $f: \mathbb{R} \rightarrow \mathbb{R}$ is said to be Lebesgue measurable if
- a) $f^{-1}(a, \infty)$ is measurable for every $a \in \mathbb{R}$
 - b) f is continuous
 - c) f is bounded
 - d) f is differentiable
- 45) constraints are independent of time.
- a) Holonomic
 - b) Non-holonomic
 - c) Scleronomic
 - d) Rheonomic
- 46) Hamiltonian of the system H can be given by $H = \dots\dots\dots$
- a) $\sum_i p_i q_i + L$
 - b) $\sum_i p_i \dot{q}_i - L$
 - c) $\sum_i p_i \dot{q}_i + L$
 - d) $\sum_i p_i q_i - L$
- 47) Let $f_n(x) = \cos^n x$, if $0 \leq x \leq \pi$ then
- a) $\lim_{n \rightarrow \infty} f_n = 0$ on $[0, \pi]$ but that $\{f_n(\pi)\}$ then
 - b) $\lim_{n \rightarrow \infty} f_n = 1$ on $[0, \pi]$
 - c) $\lim_{n \rightarrow \infty} f_n = 0$ on $[0, \pi]$ and $\{f_n(\pi)\}$ converges
 - d) $\lim_{n \rightarrow \infty} f_n \neq 0$

48) The radius of convergence of sum $\sum_{n=1}^{\infty} \frac{Z^n}{n^2}$ is

a) $\frac{1}{n^2}$

b) ∞

c) 1

d) $\frac{1}{2}$

49) The order of the element 11 in the group $U(15)$ is

A) 1

B) 2

C) 4

D) 8

50) If G is a simple group of order 168, then the number of subgroups of G of order 7 is

A) 1

B) 7

C) 8

D) 28

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:: ROUTH WORK ::