Seat No.	

Total No. of Pages : 16

P.G. Entrance Examination, 2024

M. Sc. MATHEMATICS

Subject Code : 58716

Day and Date : Thursday, 16-05-2024 **Total Marks : 100**
Time : 01:00 pm to 02:30 pm

Instructions :

1) All questions are compulsory.
2) Each question carries 1 mark.
3) Answers should be marked in the given OMR answer sheet by darkening the appropriate option.
4) Follow the instructions given on OMR sheet.
5) Rough work shall be done on the sheet provided at the end of question paper.

1. If f and g are bounded functions defined on [a, b] and P is any partition of [a, b], then which of the following is true?

   A) $U(f+g,\ P) \leq U(f,\ P) + U(g,\ P)$

   B) $U(f+g,\ P) \geq U(f,\ P) + U(g,\ P)$

   C) $L(f+g,\ P) = L(f,\ P) + L(g,\ P)$

   D) $L(f+g,\ P) \leq L(f,\ P) + L(g,\ P)$

2. Let $f(x) = x$ on [0, 1] and $P = \left\{0, \frac{1}{3}, \frac{2}{3}, 1\right\}$ be a partition of [0, 1], then U(*f*, P) = ______

   A) $1/3$ B) 1 C) $2/3$ D) $3/4$

3. If g is a continuous function on $[a,\ b]$ that is differentiable on $(a,\ b)$ and if g' is integrable on $[a,\ b]$ then $\int_a^b g' =$ _______.

   A) $g(x)$ B) $g'(b) - g'(a)$ C) $g(a) - g(b)$ D) $g(b) - g(a)$

4. If $f:[0,1] \to \mathbb{R}$ such that

$$f(x) = \begin{cases} 1 & \text{if } x \text{ is rational} \\ -1 & \text{if } x \text{ is irrational} \end{cases}, \text{ then } \_\_\_\_\_\_\_\_.$$

A) f and $|f|$ both integrable B) f is integrable but $|f|$ is not integrable

C) Neither f nor $|f|$ integrable D) $|f|$ is integrable but f is not integrable

5. $\lim_{x\to 0} \frac{1}{x} \int_0^x e^{t^2}\, dt =$ ________.

A) e^{x^2} B) 0 C) 1 D) $2\, e^{x^2}$

6. The improper integral $\int_a^b \frac{dx}{(x-a)^n} dx$ is converges if ________.

A) $n > 1$ B) $n = 1$ C) $n \neq 1$ D) $n < 1$

7. The Cauchy Principal Value of $\int_{-\infty}^{\infty} \sin t\, dt$ is ________.

A) 1 B) 0 C) $1/2$ D) Does not exist

8. The value of the Fourier coefficient a_0 in the Fourier series

$$f(x) = \frac{1}{2}a_0 + \sum_{n=1}^{\infty}(a_n \cos nx + b_n \sin nx) \text{ is } \_\_\_\_\_\_\_\_\_.$$

(A) $\frac{1}{\pi}\int_{-\pi}^{\pi} f(x)\, dx$ (B) $\frac{1}{\pi}\int_{-\pi}^{\pi} f(x) \cos x\, dx$

(C) $\frac{1}{\pi}\int_{-\pi}^{\pi} f(x) \sin x\, dx$ (D) $\frac{2}{\pi}\int_0^{\pi} f(x) \cos x\, dx$

9. If $f(x)$ is expanded in a series of sines of the form $f(x) = \sum_{n=1}^{\infty} b_n \sin nx$, then $b_n =$ _____.

(A) $\frac{1}{\pi}\int_{-\pi}^{\pi} f(x) \cos nx\, dx$ (B) $\frac{1}{\pi}\int_{-\pi}^{\pi} f(x) \sin nx\, dx$

(C) $\frac{2}{\pi}\int_0^{\pi} f(x) \cos nx\, dx$ (D) $\frac{2}{\pi}\int_0^{\pi} f(x) \sin nx\, dx$

10. In the Fourier series expansion of $f(x) = x \sin x$ in $[-\pi, \pi]$, the value of the Fourier coefficient b_n is ______________.

A) 2 B) 0 C) $\frac{-2\times(-1)^n}{n^2-1}$ D) $\frac{(-1)^n}{n^2-1}$

11. If $T: R^2 \to R^2$ and $S: R^2 \to R^3$ defined by $T(x,y) = (y,x)$ and $S(x,y) = (x-y, x+y, y)$ then ST $(x,y) =$
A) $(y+x, y-x, x)$ B) $(y-x, x+y, x)$ C) $(y-x, x+y, y)$ D) $(y+2x, y-x, x)$

12. If $u = (1,2,3,4)$ then norm of u with respect to Euclidean inner product in $\mathbb{R}^4$ is
A) 30 B) 26 C) $\sqrt{30}$ D) $\sqrt{26}$

13. If $\lambda = 1/5$ is an eigen value of an invertible operator T then eigen value of T^{-1} is
A) -5 B) $1/5$ C) 5 D) $-1/5$

14. A linear transformation $T: V \to W$ is non singular if
A) T is not one- one B) T is not onto
C) Ker $T = \{0\}$ D) Range $T = \{0\}$

15. The eigen values of the matrix $\begin{bmatrix} -1 & 2 & 3 \\ 0 & 1 & 2 \\ 0 & 0 & 2 \end{bmatrix}$ are
A) 1,2,3 B) $-1,1,0$ C) 3,2,1 D) $-1,2,1$

16. Let $T: \mathbb{R}^2 \to \mathbb{R}^2$ be a linear transformation and $\{e_1 = (1,0), e_2 = (0,1)\}$ be the standard basis of $\mathbb{R}^2$. If $T(e_1) = (1,2)$ and $T(e_2) = (2,3)$ then $T(x,y) =$
A) $(2x+y, 2x+3y)$ B) $(2x, 3y)$ C) $(x+2y, 2x+3y)$ D) $(x+y, x-y)$

17. If $T: \mathbb{R}^2 \to \mathbb{R}^2$ defined by $T(x,y) = (x-y, x)$ is an invertible linear transformation, then $T^{-1}(a,b) =$
A) $(a, a-b)$ B) $(b, a+b)$ C) $(b-a, -b)$ D) $(b-a, b)$

18. The characteristic polynomial of the matrix $\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ is
A) $x^2 - 5x - 2$ B) $x^2 + 5x - 10$ C) $x^2 - 3x$ D) $x^2 - 3x - 10$

19. The set $S = \{(1,2), (3,4), (5,6)\}$ of vectors in R^2 is
A) a linearly independent subset B) a basis of R^3
C) a linearly dependent subset D) an orthogonal set

20. If $u = (1,1,1)$ and $v = (1,2,0)$ then $\| u + v \| =$
A) $\sqrt{14}$ B) 14 C) $\sqrt{7}$ D) 3

21. For solving the equation $\frac{d^2y}{dx^2} + P\frac{dy}{dx} + Qy = R$ by using the method of variation of parameters, we assume the solution in the form $y = Au + Bv$, where A and B are_______.
A)constants B) functions of y C) functions of x D) functions of x and y.

22. The partial differential equation formed by eliminating the constants form $z = ax + by$ is____________.
$A) z = p + q$ B) $z = px + qy$ C) $z = py + qx$ D) $z = ap + bq$

23. P.I. of $\frac{1}{D^2+a^2} cosax$ is _________________.

A) $\frac{x}{2a} sinax$ B) $\frac{-x^2}{2!}\frac{1}{4a^2} sinax$ C) $\frac{x}{2a} cosax$ D) $\frac{-x^2}{2!}\frac{1}{4a^2} cosax$

24. The complementary function (C.F.) of the equation $x^2\frac{d^2y}{dx^2} + x\frac{dy}{dx} - 4y = x^2$ is_______.

A) $y = c_1x+c_2x^2$ B) $y = c_1x^2 + \frac{c_2}{x^2}$ C) $y = \frac{c_1}{x} + c_2x^2$ D) $y = c_1x + \frac{c_2}{x}$

25. The equation $(x^2 - ay)dx + (y^2 - ax)dy = 0$ is_________.
A) Homogeneous B) Variable separable C) Exact D) Linear

26. $\lim_{x\to 0} x^x$ is_____________.

A)∞ B)1 C)0 D)-∞

27. The value of $\left(\sin\frac{\pi}{3} + i\cos\frac{\pi}{3}\right)^6$ is________.

A)1 B) -1 C)0 D) i

28. If $u = sin^{-1}\left(\frac{x^2+y^2}{x+y}\right)$ then $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} =$_______________.

A)u B)$\sin u$ C) $\tan u$ D)$\sec u$

29. If $y = \cos 3x$ then y_{10}=____________.

A) 3^{10} B) $3^{10} \cdot \cos(3x + 5\pi)$ C) $\cos 10x$ D)$3^{10} \cdot \cos 3x$

30. The solution of the equation $\tan(y - px) = p$ is__________.

A) $y = cx - tan^{-1}c$ B) $y = cx + tan^{-1}c$ C) $y = cx + \tan c$ D) $y = cx + (tan^{-1}c)^2$

31. If A is Hermitian matrix then iA is …

A) Symmetric matrix
B) Skew-Hermitian matrix
C) Hermitian matrix
D) Skew Symmetric matrix

32. Let A = {1, 2, 3 } and R ={ (1, 3), (3, 1), (2, 3)} be a relation on A, then R is...

A)Symmetric only
B) anti-symmetric only
C) symmetric as well as anti-symmetric
D) neither symmetric nor anti-symmetric

33. If $a \in G$ and $a^m = e$ for some positive integer m, then…

A) $O(a) \neq m$
B) $O(a) \leq m$
C) $O(a) \geq m$
D) $O(a) = \frac{m}{2}$

34. Let Z be the set of integers and H=5Z is the subgroup of Z then [Z : 5Z] = …

A) 10
B) 5
C) 1 5
D) 20

35. An onto homomorphism is called _______

A)isomorphism
B) monomorphism
C) endomorphism
D) epimorphism

36. The set $\mathbb{Q} \cap [0,1]$ is __________

A) countable
B) uncountable
C) finite
D) none of these

37. The least upper bound of the set $\left\{ \frac{1}{n} / n \in N \right\}$ is …

A)1
B) 0
C) -1
D) 2

38. If $\{S_n\} = \{(-1)^n\}_{n=1}^{n=\infty}$, then $\lim_{n \to \infty} Sup S_n = \cdots$

A)0
B) 1
C) -1
D) 2

39. The series $\sum_{n=1}^{\infty}(-1)^{n+1}\frac{1}{n^p}$ converges for _____

A. $P < 0$
B. $P > 0$
C. $P = 0$
D. $P = -1$

40. If $\{S_n\} = \{sin(\frac{n\pi}{3})\}^{\infty}{}_{n=1}$, then $\lim_{n\to\infty} inf\ S_n$ =________

A. $\sqrt{3}/2$
B. $\sqrt{3/2}$
C. $-\sqrt{3/2}$
D. $-\sqrt{3}/2$

41. A set of non-negative individual allocations ($x_{ij} \geq 0$) which simultaneously removes deficiencies is called ……….

A) optimal solution B) feasible solution

C) basic feasible solution D) none of the above

42. The IBFS to the following transportation problem

		Destination					
		W_1	W_2	W_3	W_4	W_5	*Supply*
	F_1	3	4	6	8	9	20
Origin	F_2	2	10	1	5	8	30
	F_3	7	11	20	40	3	15
	F_4	2	1	9	14	16	13
Demand		40	6	8	18	6	

by using North-West Corner method is …………

A)128 B)878 C)104 D)199

43. Simplex problem is considered as infeasible when ….

A) all the variables in entering column are negative B) pivotal value is negative

C) variables in the basis are negative D) artificial variable is present in basis

44. In 6 × 6, transportation problem degeneracy will not arise if the number of allocations are ….

A) 36 B) > 11 C) 11 D) < 11

45. How many occupied cells must be a transportation matrix with 8 rows and 7 columns have so that it does not degenerate ….

A) 15 B) 55 C) 56 D) 14

46. There are five jobs, each of which must go through the two machines A and B in the order AB. Processing times (hours) are given below:

Job	1	2	3	4	5
Time for A	5	1	9	3	10
Time for B	2	6	7	8	4

the total ideal time for machine A is ………

A)2 B)3 C)4 D)5

47. A maximum element among the minimum elements selected for each row is called ....

A) value of the game B) saddle point

C) maximin D) minimax

48. For the following game Player B

		B_1	B_2	B_3	B_4
Player A	A_1	8	1	9	5
	A_2	6	5	7	17
	A_3	7	2	-4	10

The value of the game is ....

A)4 B)3 C)6 D)5

49. Successful applications of the linear programming techniques may be found in ....

A) all of the preceding B) chemical and oil

C) food processing D) the iron and steel industry

50. For the following game

Player B

		B_1	B_2
Player A	A_1	8	1
	A_2	6	5

The value of game is ....

A)51/7 B)52/7 C)53/7 D)54/7

51. Let $G = (V, E)$ be a graph, where $V = \{u_1, u_2, u_3, u_4, u_5\}$ and $E = \{(u_1, u_1), (u_2, u_3), (u_3, u_1), (u_4, u_2), (u_5, u_2), (u_5, u_1), (u_4, u_2)\}$ then the degree of the vertex u_1 is

A) 3 B) 4 C) 5 D) 2

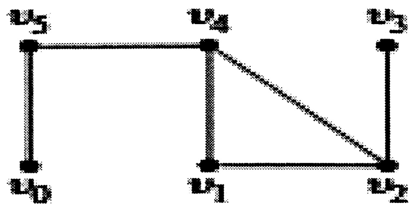
52. Let G be a simple graph. Which of the following statements is true?
P: Adjacency matrix is symmetric.
Q: Trace of adjacency matrix is 0.

A) P only B) Q only C) Both P and Q D) Neither P nor Q

53. Consider the following two statements:
I: A graph G has Euler Circuit.
II: A graph G has Hamiltonian Circuit.
Then

A) Only (I) → (II) B) Only (II) → (I)
C) (I) ↔ (II) D) Neither (I) → (II) nor (II) → (I)

54. The number of spanning trees for the following graph are



A) 3 B) 4 C) 2 D) 5

55. The minimum number of edges that must be added to an acyclic graph with k components to obtain a tree are

A) k-1 B) k+1 C) k D) k+2

56. The compound propositions p and q are called logically equivalent if ________ is a tautology.

A) ¬p ∨ ¬q B) p → q C) ¬ (p ∨ q) D) p ↔ q

57. The statement (~ p ↔ q) ∧ ~q is true if

A) p: False q: False B) p: True q: True C) p: False q: True D) p: True q: False

58. What is the decimal equivalent of the hexadecimal number BF9 ?

A) 2802 B) 3065 C) 2048 D) 1024

59. Subtraction of the binary numbers 11000 and 1011 is

A) 1101 B) 1110 C) 1100 D) 1010

60. Suppose x is a real number. Let p: $0 < x$, q: $x < 3$, and r: $x = 3$.
Then the inequality $0 < x \leq 3$ can be written symbolically as:

A) $p \Lambda (q V r)$ B) $p \Lambda r$ C) $p V q V r$ D) $p \Lambda q \Lambda r$

61. $L\{\sin 2t \cos 2t\} =$ ________.

A) $\frac{2}{s^2-16}$ B) $\frac{2}{s^2+16}$ C) $\frac{2s}{s^2+16}$ D) $\frac{2s}{s^2-16}$

62. $L\{t\cos 3t\} =$ ________.

A) $\frac{s^2-9}{(s^2+9)^2}$ B) $\frac{s}{s^2+9}$ C) $\frac{3}{s^2+9}$ D) $\frac{-6s}{(s^2+9)^2}$

63. If $F(t+2)$ is a Heaviside unit step function then $L\{F(t+2)\} =$ _______.

A) e^{-2s} B) $\frac{e^{2s}}{s}$ C) $\frac{e^{-2s}}{s}$ D) e^{2s}

64. $L^{-1}\left\{\frac{1}{4s-5}\right\} =$ _______.

A) $\frac{1}{4}e^{-\frac{5}{4}t}$ B) $\frac{1}{4}e^{\frac{5}{4}t}$ C) $\frac{1}{5}e^{-\frac{5}{4}t}$ D) $\frac{1}{5}e^{\frac{5}{4}t}$

65. If $L^{-1}\{f(s)\} = 3t^2$ then $L^{-1}\left\{\frac{f(s)}{s}\right\} =$ ____

A) t B) t^2 C) t^3 D) $\frac{t^3}{3}$

66. $L^{-1}\left\{\frac{1}{s^2-16}\right\} = F(t)$

A) $\frac{1}{4}\cosh 4t$ B) $\frac{1}{4}\cos 4t$ C) $\frac{1}{4}\sin 4t$ D) $\frac{1}{4}\sinh 4t$

67. $L^{-1}\left\{\frac{1}{s^{\frac{1}{2}}}\right\} =$ ________

A) $\frac{1}{\sqrt{t}}$ B) $\frac{1}{\sqrt{\pi t}}$ C) $\frac{\pi}{\sqrt{t}}$ D) $\sqrt{\frac{\pi}{t}}$

68. If $f(s)$ is Fourier transform of $F(X)$ then Fourier transform of $F'(X)$ is _______

where $F\{F(x)\} = \frac{1}{\sqrt{2\pi}}\int_{-\infty}^{\infty} F(x)e^{isx}\,dx$

A) $is\,f(s)$ B) $-s\,f(s)$ C) $-is\,f(s)$ D) $s\,f(s)$

69. The inversion formula for the infinite Fourier transform is ________

A) $F(x) = \frac{2}{\pi}\int_0^{\infty} F(s)\sin sx\,ds$ B) $F(x) = \frac{1}{\pi}\int_0^{\infty} F(s)\sin x\,ds$

C) $F(x) = \frac{1}{\pi}\int_0^{\infty} F(s)\sin sx\,ds$ D) $F(x) = \frac{2}{\pi}\int_0^{\infty} F(s)\sin x\,ds$

70. If $F(x)$ is continuous and $F'(x)$ is piecewise continuous, then $F_s\{F'(x)\} =$ _______

A) $F_c\{F(x)\}$ B) $-F_c\{F(x)\}$ C) $-s^2F_c\{F(x)\}$ D) $-s\,F_c\{F(x)\}$

71. The value of the integral $\int_C \frac{dz}{z^2(z+3)}$ taken counterclockwise around the circle $|z| = 2$ is …..

A) $\frac{2\pi i}{9}$ B) $2\pi i$ C) $-\frac{2\pi i}{9}$ D) $\frac{2\pi i}{3}$

72. The residue of $z^2e^{1/z}$ at z = 0 is …..

A) 1/12 B) 1/6 C)6 D)12

73. If $f(z) = u + iv$ then Cauchy Riemann equations are ……….

A) $u_x = v_x, u_y = v_y$ B) $u_x = v_y, u_y = v_x$

C) $u_x = v_y, u_y = -v_x$ D) $u_x = -v_y, u_y = v_x$

74. If $f(z) = u + iv$ is analytic function in finite region and $u = x^3 - 3xy^2$ then $v =$ …….

A) $3x^2y + y^3 + c$ B) $3x^2y - y^3 + C$ C) $3x^2y - y^2 + c$ D) $3xy + y + c$

75. The analytic function whose real part is e^x (xcosy – ysiny) is……..

A) $ze^{x^2} + iy$ B) z^2e^z C) $ze^z + ci$ D) None of these

76. A curve without multiple points is called …….

A) Jordan curve B) arc C) regular curve D) None of these

77. If $f(z) = u(x,y) + iv(x,y)$ is such that both $u(x,y)$ and $v(x,y)$ satisfies Cauchy Riemann equations and if $u_x(x,y) = x$ and $u_y(x,y) = -y$ then for any $z = (x,y)$, the value of $f'(z) = \cdots$

A) z B) $-z$ C) 0 D) $\bar{z}$

78. . If $f(z)=|z|^2$ then f is

A) differentiable B) nowhere differentiable
C) differentiable only at $z=0$ D) analytic at $z=0$

79. If $f(z)=\sqrt{|xy|}$ then

A) f is differentiable at $z=0$ B) C-R equations are not satisfied at 0.
C) f is not differentiable at $z=0$ D) f is nowhere continuous

80. If $u(x, y) = x^2 - y^2$ then corresponding analytic function $f(z) =$ ________________

A) $z^2 + c$ B) $z^3 + c$ C) $z + c$ D) $z^3 + ic$

81. Every Cauchy sequence in discrete metric space is ---------------.

A) divergent B) convergent C) oscillatory D) none of these

82. Which of the following is an open subset of an absolute metric space R?

A) {a} B) (a, ∞) C) (a, b] D) none of these

83. In any metric space arbitrary union of open sets ---------------.

A) need not be open set B) is closed set

C) is open set D) neither open set nor closed set

84. If M is the closed interval $[0, 1]$ with absolute value metric, then B $\left[\frac{1}{4}; \frac{1}{2}\right]$ is ---------------.

A) $\left[0, \frac{3}{4}\right]$ B) $\left(0, \frac{3}{4}\right)$ C) $\left(\frac{1}{4}, \frac{3}{4}\right)$ D) $\left[0, \frac{3}{4}\right)$

85. Let E be a subset of the metric space M. Then a point $x \in M$ is called Limit point of E if ---------------.

A) there exists a sequence $\{x_n\}_{n=1}^{\infty}$ of points of M which diverges to x

B) there exists a sequence $\{x_n\}_{n=1}^{\infty}$ of points of E which converges to x

C) there exists a sequence $\{x_n\}_{n=1}^{\infty}$ of points of E which diverges to x

D) there exists a sequence $\{x_n\}_{n=1}^{\infty}$ of points of M which converges to x

86. Let f be a function from a set A into a metric space M. Then the function f is bounded if

A) f(A) is bounded subset of M B) A is bounded subset of M

C) f(A) is closed subset of M B) A is closed subset of M

87. If A is not bounded subset of a metric space M then diam (A) is ---------------.

A) less than zero B) 0 C) 1 D) infinity

88. The metric space [a, b] with absolute value metric is --------------.

A) complete and not totally bounded

B) totally bounded and not complete

C) both complete and totally bounded

D) neither complete nor totally bounded

89. If M is connected metric space then--------------.

A) M has a proper subset which is both open and closed

B) M has a no proper subset which is both open and closed

C) M is not open

D) M is not closed

90. A subset C = {0, 1, 2, . . . , 100} in discrete metric space is--------------.

A) connected B) open C) need not be open D) compact

91. Consider the following statements:

I) Set of integers forms an abelian group w.r.t. the usual addition.

II) Set of integers forms a group w.r.t. the usual multiplication.

Then

A) Only I) is true

B) Only II) is true

C) Both I) and II) are true

D) Both I) and II) are false

92. $o(S_3) =$ ______.

A) 1

B) 3

C) 0

D) 6

93. Let G be a group and let $a \in G$. Consider the following statements:

I) $cl(a) = \{a\}$.

II) $a \in Z(G)$.

Then

A) Only I) $\Longrightarrow$ II)

B) Only II) $\Longrightarrow$ I)

C) Neither I) $\Longrightarrow$ II) nor II) $\Longrightarrow$ I)

D) I) $\Longleftrightarrow$ II)

94. Consider the following statements:

I) R is an integral domain.

II) R is a field.

Then

A) Only I) $\Longrightarrow$ II)

B) Only II) $\Longrightarrow$ I)

C) Neither I) $\Longrightarrow$ II) nor II) $\Longrightarrow$ I)

D) I) $\Longleftrightarrow$ II)

95. Characteristic of a ring of integers is _____ .

A)1 B)2 C) 0 D)a prime number.

96. Which of the following statement is **not** correct for the ring $Z_4 = \{0, 1, 2, 3\}$ under addition and multiplication modulo 4?

A) 0 is idempotent B) 1 is idempotent C) 2 is idempotent D) 2 is nilpotent

97. An ideal $M \neq R$ of a ring R is said to be maximal ideal of R if whenever N is an ideal of R such that _____ then either $N = M$ or $N = R$.

A) $M \subseteq R \subseteq N$ B) $N \subseteq R \subseteq M$ C) $N \subseteq M \subseteq R$ D) $M \subseteq N \subseteq R$

98. Which of the following is alternating group A_3?

A) $\{(1\ 3), (1\ 2), (1\ 3\ 2)\}$ B) $\{(1), (1\ 2\ 3), (1\ 3\ 2)\}$

C) $\{(2), (1\ 2\ 3), (1\ 3)\}$ D) $\{(1\ 2), (1\ 3), (2\ 3)\}$

99. Let G be a group and S be a subgroup of G. Let R be a ring and I be an ideal of R. Consider the following statements:

I) Quotient group $\frac{G}{S}$ can be defined.

II) Quotient ring $\frac{R}{I}$ can be defined. Then

A) Both I) and II) are true.

B) Only I) is true.

C) Both I) and II) are false.

D) Only II) is true.

100. Consider the field $Z_3 = \{0,1,2\}$ modulo 3.

If $f(x) = 1 + x^2 + x^3,\ g(x) = 2 + 2x^3 \in Z_3[x]$ over Z_3,

then $f(x) + g(x) =$____.

A) x^2 B) $1 + x^2 + x^3$ C) $1 + x^3$ D) $1 + x^2$

◆◆◆

ROUGH WORK

ROUGH WORK