Roll No. ....

Question Booklet Number

O. M. R. Serial No. | | | | | | | |

M. A./M. Sc. (Fourth Semester)
(NEP) EXAMINATION, 2025-26

MATHEMATICS

(Advanced Abstract Algebra)

Paper Code							
B	0	3	1	0	0	1	T

Questions Booklet Series

A

Time : 1:30 Hours] [*Maximum Marks : 75*

Instructions to the Examinee :

1. Do not open the booklet unless you are asked to do so.
2. The booklet contains 100 questions. Examinee is required to answer 75 questions in the OMR Answer-Sheet provided and not in the question booklet. All questions carry equal marks.
3. Examine the Booklet and the OMR Answer-Sheet very carefully before you proceed. Faulty question booklet due to missing or duplicate pages/questions or having any other discrepancy should be got immediately replaced.

परीक्षार्थियों के लिए निर्देश :

1. प्रश्न-पुस्तिका को तब तक न खोलें जब तक आपसे कहा न जाए।
2. प्रश्न-पुस्तिका में 100 प्रश्न हैं। परीक्षार्थी को 75 प्रश्नों को केवल दी गई OMR आन्सर-शीट पर ही हल करना है, प्रश्न-पुस्तिका पर नहीं। सभी प्रश्नों के अंक समान हैं।
3. प्रश्नों के उत्तर अंकित करने से पूर्व प्रश्न-पुस्तिका तथा OMR आन्सर-शीट को सावधानीपूर्वक देख लें। दोषपूर्ण प्रश्न-पुस्तिका जिसमें कुछ भाग छपने से छूट गए हों या प्रश्न एक से अधिक बार छप गए हों या उसमें किसी अन्य प्रकार की कमी हो, तो उसे तुरन्त बदल लें।

(Remaining instructions on the last page)

(शेष निर्देश अन्तिम पृष्ठ पर)

(Only for Rough Work)

1. Order of the field $\frac{z[i]}{\langle 3 \rangle}$ is :

(A) 49
(B) 89
(C) 9
(D) 4

2. Number of elements in $\frac{z[i]}{\langle 1+2i \rangle}$ is :

(A) 5
(B) 25
(C) 20
(D) 21

3. $\frac{z[x]}{\langle x \rangle}$ is isomorphic to :

(A) ϕ
(B) Q
(C) Z
(D) R

4. (Z, +, ·) be the ring of integers and $\langle n \rangle$ be the ideal generated by then $\frac{z}{\langle n \rangle}$ is isomorphic to :

(A) Z_n
(B) Q
(C) R
(D) $\mathbb{C}$

5. The field $Q(\sqrt{3}, \sqrt{5})$ is equal to :

(A) Q
(B) Q(2)
(C) $Q(\sqrt{3} + \sqrt{5})$
(D) Q(15)

6. If k is an extension of a field F and $a \in k$ is algebraic over F then F(a) is :

(A) A finite extension of F
(B) An infinite extension of F
(C) F(a) is not a field
(D) None of the above

7. If Q is the field of rational numbers, then $[Q(\sqrt{2}, \sqrt{3}) : Q]$ is :

(A) 2
(B) 3
(C) 4
(D) 8

8. If Q is the field of rational numbers, then $[Q(2^{1/3}, 3^{1/4}) : Q]$ is :

(A) 12
(B) 24
(C) 36
(D) 6

9. Basis of $Q(\sqrt{3}, \sqrt{5})$ over Q is :

(A) {1, 3}
(B) $\{1, \sqrt{3}, \sqrt{5}, \sqrt{15}\}$
(C) $\{1, \sqrt{15}\}$
(D) $\{1, \sqrt{5}\}$

10. $[Q(2^{1/2}, 2^{1/4}, 2^{1/8}) : Q]$ is :

(A) 2
(B) 4
(C) 6
(D) 8

11. If L is a finite extension of k and k is a finite extension of F then :

(A) $[L : F] = [L : k]$

(B) $[L : F] = [L : k] [k : F]$

(C) $[L : F] = [L : Q]$

(D) None of the above

12. Which statement is true ?

(A) If $a_1, a_2, ..., a_n \in k$ are algebraic over F then $F(a_1, a_2, ..., a_n)$ is a finite extension of F.

(B) Any finite extension is not algebraic.

(C) If $F(a)$ is a finite extension of F then a is not algebraic over F.

(D) If $a \in k$ is algebraic over F then $F(a)$ is not a finite extension of F.

13. Which statement is true ?

(A) There exists a field of 24 elements

(B) There exists a field of 48 elements

(C) There exists a field of 92 elements

(D) There exists a field of 25 elements

14. If $p(x) \in F[x]$, then an element a lying in some extension field of F is a root of $p(x)$ if :

(A) $p(a) = 0$

(B) $p(a) = 1$

(C) $p(a) = 2$

(D) $p(a) = 4$

15. If $a \in k$ is a root of $p(x) \in F[x]$ where $F \subseteq k$ then in $k[x]$:

(A) $\dfrac{(x-a)}{p(x)}$

(B) $\dfrac{(x-a)^2}{p(x)}$

(C) $\dfrac{(x-a)^3}{p(x)}$

(D) $(x-a)$ does not divide $p(x)$

16. A polynomial of degree 5 over a field can have at most :

(A) 5 roots in any extension field

(B) 6 roots in any extension field

(C) 7 roots in any extension field

(D) No roots

17. The element $a \in k$ is a root of $p(x) \in F[x]$ where $F \subseteq k$ of multiplicity 5, if :

(A) $\dfrac{(x-a)^5}{p(x)}$ whereas $(x-a)^6 \nmid p(x)$

(B) $\dfrac{(x-a)^6}{p(x)}$ whereas $(x-a)^7 \nmid p(x)$

(C) $\dfrac{(x-a)^7}{p(x)}$ whereas $(x-a)^8 \nmid p(x)$

(D) None of the above

18. Which statement is not true ?

(A) R is a transcendental extension of Q

(B) C is an algebraic extension of R

(C) $[\mathbb{C} : R] = 2$

(D) $\{1, i\}$ does not form a basis of $\mathbb{C}$ over R

19. The monic, minimal polynomial corresponding to $\sqrt{2}$ is :

(A) $x^2 - 4$

(B) $x^2 - 2$

(C) $x^3 - 2$

(D) $x^4 - 2$

20. $[Q(2^{1/3}, 2^{1/2}) : Q(2^{1/2})]$ is :

(A) 2

(B) 3

(C) 4

(D) 5

21. Inverse of $3 - \sqrt{2} \in Q(\sqrt{2})$ is :

(A) $\frac{1}{7}(\sqrt{2} + 3)$

(B) $\sqrt{2} + 3$

(C) $\sqrt{2}$

(D) $\sqrt{3}$

22. Inverse of $1 - 2^{1/3} + 4^{1/3} \in Q(2^{1/3})$ is :

(A) $\frac{(2^{1/3} + 1)}{3}$

(B) $2^{1/3}$

(C) $\frac{2^{1/3} - 1}{2}$

(D) $\frac{2^{1/3} + 2^{1/2}}{2}$

23. Let k be an extension of a field F and let $a \in k$ be algebraic of degree 7 over F. Then F(a) will be of the form :

(A) $\{\alpha_0 + \alpha_1 a + \alpha_2 a^2 : \alpha_i \in F\}$

(B) $\{\alpha_0 + \alpha_1 a : \alpha_2 a^2 + \alpha_3 a^3 + \alpha_4 a^4 + \alpha_5 a^5 + \alpha_6 a^6 : \alpha_i \in F\}$

(C) $\{\alpha_0 + \alpha_1 a : \alpha_i \in F\}$

(D) $\{\alpha_0 + \alpha_1 a + \alpha_2 a^2 + \alpha_3 a^3 : \alpha_i \in F\}$

24. Consider the polynomial

$$p(x) = x^2 + x + 1$$

in $z_2[x]$. If α be a root of $p(x)$ then the extended field containing α will be :

(A) $z_2(\alpha)$

(B) z_3

(C) z_4

(D) $z_5(\alpha)$

25. Which statement is not true ?

(A) $\frac{R[x]}{\langle x^2 + 1 \rangle} \cong \mathbb{C}$

(B) There exists a field of 8 elements

(C) $[Q(2^{1/3}, 2^{1/2} : Q] = 6$

(D) R is a finite extension of Q

26. Which statement is not true ?

(A) Let F[x] be the ring of polynomials in x over the field F and let $g(x) \in F[x]$ of degree n and let $\langle g(x) \rangle$ be the ideal generated by $g(x)$, then F[x] / $\langle g(x) \rangle$ is an n-dimensional vector space over F.

(B) Let k be an extension of a field F and let $a \in k$ be algebraic over F. Then F(a) is isomorphic to F[x]/V, where V is the ideal of F[x] generated by the minimal polynomial for a over F.

(C) $\mathbb{C}$ is a finite extension of Q.

(D) Every finite extension is algebraic.

27. Basis of $Q(\sqrt{11})$ over Q will be :

(A) {1, 11}

(B) {1, 2}

(C) $\{1, \sqrt{11}\}$

(D) None of the above

28. Which statement is true ?

(A) $\sqrt{2} + \sqrt{\pi}$ is algebraic over Q(π)

(B) $\sin^{-1} 1$ is algebraic over Q

(C) $Q(\sqrt{2}, \sqrt{3}) = Q(\sqrt{5})$

(D) Basis of $Q(\sqrt{3}, \sqrt{7})$ over Q is $\{1, \sqrt{3}, \sqrt{7}\}$

29. If $p(x)$ is the minimal polynomial for a over F, then which statement is true :

(A) $[F(a) : F] > \deg p(x)$

(B) $[F(a) : F] < \deg p(x)$

(C) $[F(a) : F] = \deg p(x)$

(D) None of the above

30. It $p(x) = x^2 - 2x + 2 \in z_3[x]$ and if α be a root of $p(x)$ then the field $z_3(\alpha)$ has :

(A) 7 elements

(B) 8 elements

(C) 9 elements

(D) 10 elements

31. If $p(x)$ is a polynomial in F[x] of degree 7 and it is irreducible over F, then the extension field k of F in which $p(x)$ has a root, then which is true ?

(A) $[k : F] = 2$

(B) $[k : F] = 3$

(C) $[k : F] = 7$

(D) None of the above

32. If $f(x) \in F[x]$, then the finite extension k of F in which $f(x)$ has a root, then which is true ?

(A) $[k : F] \le \deg f(x)$

(B) $[k : F] \ge \deg f(x)$

(C) $2[k : F] = \deg f(x)$

(D) None of the above

33. Let $f(x) \in F[x]$ be a irreducible polynomial. Then the finite extension k of F in which $f(x)$ has all roots and if deg $f(x) = 5$ then $[k : F]$ will be at most :

(A) 1

(B) 2!

(C) 5!

(D) 7!

34. Splitting field of $x^4 - x^2 - 2 \in Q[x]$ is :

(A) $Q(\sqrt{2})$

(B) $Q(\sqrt{2}, \sqrt{3})$

(C) $Q(\sqrt{2}, i)$

(D) $Q(i)$

35. Splitting field of $x^2 + x + 2 \in z_3[x]$ is :

(A) z_3

(B) $z_3[i]$

(C) z

(D) None of the above

36. Consider the polynomial $x^2 - 2x + 2 \in z_3[x]$ and if $z_3(\alpha)$ be its splitting field, then which is true ?

(A) $[z_3(\alpha) : z_3] = 2$

(B) $[z_3(\alpha) : z_3] = 4$

(C) $[z_3(\alpha) : z_3] = 6$

(D) None of the above

37. Consider the polynomial $x^2 + 2x + 2 \in z_3[x]$. sssssThen its splitting field will be :

(A) $z_3[x]$

(B) $\frac{z_3[x]}{\langle x^2 + x + 1 \rangle}$

(C) $\frac{z_3[x]}{\langle x^2 + 2x + 2 \rangle}$

(D) $\frac{z_3[x]}{\langle x^2 + 5x + 5 \rangle}$

38. $[Q(\sqrt{11}, i) : Q]$ is :

(A) 4

(B) 6

(C) 8

(D) 10

39. Degree of splitting field of $x^4 + 2$ over Q is :

(A) 2

(B) 4

(C) 6

(D) 8

40. Splitting field of the polynomial $x^7 - 1 \in Q[x]$ is of degree :

(A) 2

(B) 4

(C) 6

(D) 8

41. Let F be a field of characteristic 7 and let b be a root of $f(x) = x^7 - x - a \in F[x]$. Then the splitting field of $f(x)$, over F is :

(A) F

(B) F(b)

(C) F(a)

(D) None of the above

42. Let F be the splitting field of $x^7 - 2 \in Q[x]$ and $\alpha = e^{2\pi i/7}$, a primitive seventh root of unity, then :

(A) $[F : Q(\alpha)] = 9$

(B) $[F : Q(\alpha)] = 7$

(C) $[F : Q] = 4$

(D) $[F : Q] = 5$

43. The degree of splitting field for $f(x) = x^7 - 2 \in Q[x]$ is :

(A) 7

(B) 14

(C) 28

(D) 42

44. Degree of splitting field for $f(x) = x^{11} - 2$ over Q is :

(A) 11

(B) 110

(C) 120

(D) 140

45. Basis of $Q(\sqrt{7}, \sqrt{11})$ over Q is :

(A) $\{1, \sqrt{7}\}$

(B) $\{1, \sqrt{11}\}$

(C) $\{1, \sqrt{77}\}$

(D) $\{1, \sqrt{7}, \sqrt{11}, \sqrt{7}\ \sqrt{11}\}$

46. Splitting field of $x^{13} - 1 \in Q[x]$ will be of degree :

(A) 12

(B) 13

(C) 14

(D) 15

47. Degree of splitting field of $f(x) = x^4 - 2 \in Q[x]$ will be :

(A) 2

(B) 4

(C) 6

(D) 8

48. Degree of extension of the splitting field of $x^n - 1 \in Q[x]$ will be :

(A) n

(B) $n - 1$

(C) $\phi(n)$ (Euler's function)

(D) n^2

49. Splitting field of $x^5 - 2 \in Q[x]$ will be :

(A) $Q(2^{1/2})$

(B) $Q(2^{1/3})$

(C) $Q(2^{1/5})$

(D) $Q(2^{1/7})$

50. Degree of splitting field of $x^3 - 7 \in Q[x]$ will be :

(A) 2

(B) 4

(C) 6

(D) 8

51. Degree of splitting field of $x^4 + 1 \in Q[x]$ will be :

(A) 2

(B) 4

(C) 6

(D) 8

52. Let $f(x) \in F[x]$ be an irreducible polynomial and if E_1 and E_2 are its two splitting fields, then :

(A) E_1 is isomorphic to E_2

(B) $E_1 > E_2$

(C) $E_1 < E_2$

(D) E_1 and E_2 are not related

53. If $p(x) \in F[x]$ is irreducible and if a, b are two roots of $p(x)$, then which statement is not true ?

(A) F(a) is isomorphic to F(b)

(B) F(a) is a simple extension of F

(C) F(b) is a simple extension of F

(D) F(a) is a subfield of F

54. Let $f(x) \in F[x]$ where F is a field of characteristic zero and if $f'(x) = 0$, then which is true ?

(A) $f(x) = 0$

(B) $f(x)$ is a constant polynomial

(C) $\deg f(x) < \deg f'(x)$

(D) $\deg f(x) = 0$

55. Let F be a field and let $f(x) \in F[x]$ such that $f'(x) = 0$ and characteristic of F is p, then which is true ?

(A) $f(x) = 0$

(B) $f'(x) = 0$

(C) $f(x) = g(x^p)$ where $g(x)$ is a polynomial in F[x]

(D) None of the above

56. Let $f(x) = g(x)(x - a)^{10}$, where $g(x)$ is a polynomial in F[x] and $a \in F$, where F is a field, then :

(A) $f(x) = 0$

(B) $g(x) = 0$

(C) $f(x)$ has multiple roots

(D) None of the above

57. Which statement is true ?

(A) $Q(2^{1/2})$ is a simple extension of Q

(B) $\sin^{-1} 1$ is algebraic over Q

(C) $Q(\sqrt{2} + \sqrt{3}) = Q(\sqrt{5})$

(D) $[Q(\sqrt{2}) : Q] = 5$

58. Let F be a field of characteristic 7. Then the polynomial $x^{49} - x \in F[x]$ has :

(A) No roots

(B) No multiple roots

(C) All roots are zero

(D) None of the above

59. Let F be a field of characteristics 11. Then the polynomial $x^{121} - x \in F[x]$ has :

(A) All zero roots

(B) All distinct roots

(C) No root

(D) None of the above

60. Which statement is true ?

(A) $Q(\sqrt{2}, \sqrt{3}) = Q(\sqrt{2} + \sqrt{3})$

(B) $Q(\sqrt{2}, \sqrt{3}) = Q(\sqrt{5})$

(C) $Q(\sqrt{2}, \sqrt{3}) = Q(\sqrt{2})$

(D) $Q(\sqrt{2}) = Q(\sqrt{3})$

61. Primitive element for $Q(i, 2^{1/2})$ over Q is :

(A) $\sqrt{2}$

(B) $\sqrt{2} + i$

(C) i

(D) 2

62. Which statement is not true ?

(A) Any finite extension of a field of characteristic zero is a simple extension

(B) $[Q(\sqrt{3}, \sqrt{5}) : Q] = 4$

(C) $[Q(\sqrt{3}, \sqrt{5}) : Q] = 8$

(D) $Q(\sqrt{3}, \sqrt{5}) = Q(\sqrt{3} + \sqrt{5})$

63. Let F be a field of characteristic p and k be its extension and a be an algebraic element of k over F. Then a will be separable over F if :

(A) $F(a) = F$

(B) $F(a^p) = F(a)$

(C) $F(a^p) = F$

(D) None of the above

64. Let F be a field of characteristic 7. Then any algebraic extension of F will be separable, if :

(A) $F = F^7$

(B) $F = F^5$

(C) $F = F^{49}$

(D) $F = F^2$

65. If m is an integer which is not a perfect square and if $\alpha + \beta\sqrt{m}$ (α, β are rationals) is the root of a polynomial $p(x)$ having rational coefficients, then other root will be :

(A) $\alpha - \beta$

(B) $\alpha - \beta\sqrt{m}$

(C) α

(D) β

66. Let k be a field. Then σ will be an automorphism of k if : where $a, b \in k$.

(A) $\sigma(a+b) = \sigma(a) + \sigma(b)$

(B) $\sigma(ab) = \sigma(a)\,\sigma(b)$

(C) $\sigma(a+b) = \sigma(a) + \sigma(b)$,
$\sigma(ab) = \sigma(a)\sigma(b)$

(D) None of the above

67. Let A(k) denotes the set of all automorphism of k, then A(k) will form a group with respect to :

(A) Addition

(B) Multiplication

(C) Composition of mapping

(D) None of the above

68. Let G be a subset of A(k), where A(k) denotes the set of all automorphism of k, then fixed field of G will be :

(A) k

(B) G

(C) Subfield of k

(D) None of the above

69. The Galois group of the equation $x^3 - 2 = 0$ over Q has :

(A) 1 element

(B) 2 elements

(C) 4 elements

(D) 6 elements

70. A finite extension k of a field F is said to be a normal extension of F if the fixed field of G(k, F) is :

(A) F

(B) Q

(C) k

(D) None of the above

71. Which statement is not true ?

(A) A field is called perfect if all finite extensions of F are separable

(B) Every field of characteristic zero is perfect

(C) Every finite field is perfect

(D) Every field with a non-zero characteristic is perfect

72. Which statement is not true ?

(A) If L is a normal extension of F and K is an intermediate field then L is also normal extension over K.

(B) If L is a normal extension of F and K is an intermediate field then K is a normal extension of F.

(C) K is a normal extension of field F of characteristic zero if and only if K is the splitting field of some polynomial over F.

(D) Every field of characteristic zero is perfect.

73. Which statement is not true ?

(A) Let α, β be separable over field F. Then F(α, β) is a simple extension of F.

(B) Galois group of a polynomial is a group of permutations of its roots.

(C) Every field with a non-zero characteristic is perfect.

(D) Every finite field is perfect.

74. O(G(C, R)) is, where C denotes the field of complex numbers and R the field of real numbers :

(A) 2

(B) 4

(C) 6

(D) 8

75. **C** is normal extension of (**C** denotes the field of complex numbers) :

(A) Q

(B) R

(C) N

(D) Z

76. O(G(K, Q)) where $k = \frac{Q[x]}{\langle x^2 - 2 \rangle}$ is :

(A) 2

(B) 4

(C) 6

(D) 8

77. Let $k = Q(2^{1/3})$. Then O(G(K, Q)) is :

(A) 1

(B) 2

(C) 3

(D) 4

78. If K is a finite extension of F, then :

(A) o(G(K, F)) ≥ [K : F]

(B) o(G(K, F)) = 0

(C) o(G(K, F)) ≤ [K : F]

(D) None of the above

79. $x^m - 1$ divides $x^n - 1$ over a field F if :

(A) $m > n$

(B) $m = 8$

(C) $m \mid n$

(D) $m = 2n$

80. The set of rational numbers form :

(A) Not a field

(B) Prime field

(C) Not a group with respect to addition

(D) None of the above

81. If characteristic $f = p$ and $a, b \in F$, then :

(A) $(a + b)^{p^2} = a + b$

(B) $(a + b)^{p^2} = a^{p^2} + b^{p^2}$

(C) $(a + b)^{p^2} = a^{p^2}$

(D) $(a + b)^{p^2} = a$

82. Which statement is not true ?

(A) $Q(2^{1/3}, 3^{1/2})$ is a radical extension of Q.

(B) Angle θ is constructible if sin θ is constructible.

(C) Regular pentagon is constructible.

(D) We can trisect an angle by rular and compass only.

83. If F is a finite field of characteristic p, then F can have :

(A) p^n elements

(B) 2 elements

(C) 4 elements

(D) 8 elements

84. If F is a finite field of characteristic 7, then F can have :

(A) 8 elements

(B) 49 elements

(C) 9 elements

(D) 2 elements

85. If a finite field F has 27 elements, then $a \in F$ satisfies the relation :

(A) $a^{27} = a^4$

(B) $a^{27} = a^3$

(C) $a^{27} = a^2$

(D) $a^{27} = a$

86. The submodule A + B is generated by :

(A) $A \cup B$

(B) $A \cap B$

(C) $A^C \cap B$

(D) $A \cup B^C$

87. A module is generalization of :

(A) Group

(B) Ring

(C) Field

(D) Vector space

88. Let N be an R-module. Then Hom_R (N, N) is :

(A) A subring of Hom (N, N)

(B) A subfield of Hom (N, N)

(C) A vector space of Hom (N, N)

(D) None of the above

89. If A and B are submodules of M, then which is true ?

(A) $\frac{A + B}{B} \cong A$

(B) $\frac{A + B}{B} \cong \frac{A}{A \cap B}$

(C) $\frac{A + B}{B} \cong A \cap B$

(D) $\frac{A + B}{B} \cong B$

90. Suppose R is a ring with unity and M is a module over R and is not unital. Then there exists $m \in M$ such that :

(A) $r_m = 0, \forall\, r \in R$

(B) $r_m = 1, \forall\, r \in R$

(C) $r_m = 2, \forall\, r \in R$

(D) $r_m = 4, \forall\, r \in R$

91. If T is a homomorphism of an R-module M into an R-module N, then which is not true ?

(A) T(o) = 0

(B) $T(-m) = -T(m), m \in M$

(C) $T(m_1 - m_2) = T(m_1) - T(m_2), m_1, m_2 \in M$

(D) T(o) = 4

92. Let T be a module homomorphism. Then T is an isomorphism if :

(A) kernel T = {1}

(B) kernel T = {0}

(C) kernel T = {0, 1}

(D) kernel T = {0, 1, 2}

93. A module M is direct sum of its two submodules M_1 and M_2 if :

(A) $M = M_1 + M_2, M_1 \cap M_2 = \{1\}$

(B) $M = M_1 + M_2, M_1 \cap M_2 = \{0\}$

(C) $M = M_1 + M_2, M_1 \cap M_2 = \{0, 1\}$

(D) None of the above

94. Let M be a free R-module with basis $\{e_1, e_2, ... e_n\}$. Then :

(A) $M \cong R$

(B) $M \cong R^{n-1}$

(C) $M \cong R^n$

(D) $M = R^{n+1}$

95. Let M be a R-module and N a submodule such that M/N is free. Then M is isomorphic to :

(A) $N \oplus \frac{M}{N}$

(B) $N \oplus M$

(C) $M \cap N$

(D) $M \cup N$

96. An R-module M is completely reducible if :

(A) $M = \prod_{\alpha \in \wedge} M_\alpha$, where M_α are simple R-submodules

(B) $M = M_1 \times M_2$, M_1 and M_2 are simple R-submodules

(C) $M = \sum_{\alpha \in \wedge} M_\alpha$, M_α are simple R-submodules

(D) None of the above

97. Let M and N be simple R-modules. Then a non-zero homomorphism from M to N is an isomorphism is known as :

(A) Schur's Lemma

(B) Wedderburn-Artin Theorem

(C) Hilbert Basis Theorem

(D) None of the above

98. Let M be a Noetherian module. Then any non-zero submodule contains a :

(A) Uniform module

(B) Vector space

(C) Field

(D) None of the above

99. Let R be a commutative ring with identity. Then the polynomial ring $R[x]$ is Noetherian if and only if R is Noetherian. This is known as :

(A) Hilbert Basis Theorem

(B) Noether-Laskar Theorem

(C) Schur's Lemma

(D) Wedderburn-Artin Theorem

100. An unital R-module M is said to be free module over R if :

(A) It admits a basis

(B) $M = R$

(C) $M = R \times R$

(D) None of the above

(Only for Rough Work)

4. Four alternative answers are mentioned for each question as—A, B, C & D in the booklet. The candidate has to choose the correct answer and mark the same in the OMR Answer-Sheet as per the direction :

Example :

Question :

Q. 1 (A) ● (C) (D)
Q. 2 (A) (B) ● (D)
Q. 3 (A) ● (C) (D)

Illegible answers with cutting and over-writing or half filled circle will be cancelled.

5. Each question carries equal marks. Marks will be awarded according to the number of correct answers you have.
6. All answers are to be given on OMR Answer Sheet only. Answers given anywhere other than the place specified in the answer sheet will not be considered valid.
7. Before writing anything on the OMR Answer Sheet, all the instructions given in it should be read carefully.
8. After the completion of the examination candidates should leave the examination hall only after providing their OMR Answer Sheet to the invigilator. Candidate can carry their Question Booklet.
9. There will be no negative marking.
10. Rough work, if any, should be done on the blank pages provided for the purpose in the booklet.
11. To bring and use of log-book, calculator, pager and cellular phone in examination hall is prohibited.
12. In case of any difference found in English and Hindi version of the question, the English version of the question will be held authentic.

Impt. : On opening the question booklet, first check that all the pages of the question booklet are printed properly. If there is any discrepancy in the question Booklet, then after showing it to the invigilator, get another question Booklet of the same series.

4. प्रश्न-पुस्तिका में प्रत्येक प्रश्न के चार सम्भावित उत्तर—A, B, C एवं D हैं। परीक्षार्थी को उन चारों विकल्पों में से सही उत्तर छाँटना है। उत्तर को OMR आन्सर-शीट में सम्बन्धित प्रश्न संख्या में निम्न प्रकार भरना है :

उदाहरण :

प्रश्न :

प्रश्न 1 (A) ● (C) (D)
प्रश्न 2 (A) (B) ● (D)
प्रश्न 3 (A) ● (C) (D)

अपठनीय उत्तर या ऐसे उत्तर जिन्हें काटा या बदला गया है, या गोले में आधा भरकर दिया गया, उन्हें निरस्त कर दिया जाएगा।

5. प्रत्येक प्रश्न के अंक समान हैं। आपके जितने उत्तर सही होंगे, उन्हीं के अनुसार अंक प्रदान किये जायेंगे।
6. सभी उत्तर केवल ओ. एम. आर. उत्तर-पत्रक (OMR Answer Sheet) पर ही दिये जाने हैं। उत्तर-पत्रक में निर्धारित स्थान के अलावा अन्यत्र कहीं पर दिया गया उत्तर मान्य नहीं होगा।
7. ओ. एम. आर. उत्तर-पत्रक (OMR Answer Sheet) पर कुछ भी लिखने से पूर्व उसमें दिये गये सभी अनुदेशों को सावधानीपूर्वक पढ़ लिया जाये।
8. परीक्षा समाप्ति के उपरान्त परीक्षार्थी कक्ष निरीक्षक को अपनी OMR Answer Sheet उपलब्ध कराने के बाद ही परीक्षा कक्ष से प्रस्थान करें। परीक्षार्थी अपने साथ प्रश्न-पुस्तिका ले जा सकते हैं।
9. निगेटिव मार्किंग नहीं है।
10. कोई भी रफ कार्य, प्रश्न-पुस्तिका के अन्त में, रफ-कार्य के लिए दिए खाली पेज पर ही किया जाना चाहिए।
11. परीक्षा-कक्ष में लॉग-बुक, कैलकुलेटर, पेजर तथा सेल्युलर फोन ले जाना तथा उसका उपयोग करना वर्जित है।
12. प्रश्न के हिन्दी एवं अंग्रेजी रूपान्तरण में भिन्नता होने की दशा में प्रश्न का अंग्रेजी रूपान्तरण ही मान्य होगा।

महत्वपूर्ण : प्रश्नपुस्तिका खोलने पर प्रथमतः जाँच कर देख लें कि प्रश्न-पुस्तिका के सभी पृष्ठ भलीभाँति छपे हुए हैं। यदि प्रश्नपुस्तिका में कोई कमी हो, तो कक्षनिरीक्षक को दिखाकर उसी सिरीज की दूसरी प्रश्न-पुस्तिका प्राप्त कर लें।