Sr. No …….

[SET-V]
Ph.D. Programme (Odd Semester)
MATHEMATICS

Marks: 100 **Time:** 2 hours

Roll No.: _____ **Date:** _____

Time: _____ **Centre Name:** _____

INSTRUCTIONS FOR THE CANDIDATES	
1.	**Please do not open (Break the seal) of the question booklet before time**
2.	An **OMR answer sheet** is being provided separately along with this question booklet. Please fill up all relevant entries like Roll number, Centre code, Paper Number etc. in the spaces provided on the OMR answer sheet and put your signature in the box provided for this purpose.
3.	**There are 100 questions in this booklet.** Against each question four alternative choices (A), (B), (C) and (D) are given, out of which only one is correct. Indicate your choice of answer by Darkening the suitable circle with **Black/Blue Ball Pen** in the OMR answer sheet supplied to you separately.
4.	Each question carries one mark. **There will be 1/4th negative marking.**
5.	Read and follow the instructions given on the backside of the OMR answer sheet carefully.
6.	Do not write your name/Roll number or give any identification mark at any place on the OMR sheet.
7.	Keep all your belongings outside the examination hall. Do not retain any paper except the **ADMIT CARD.**
8.	Do not talk to each other. Do not borrow anything from other candidates.
9.	Use of **CALCULATOR (except programmable calculator)** is allowed.
10.	Any body found involved in malpractices, will be disqualified from appearing in the entrance test.
11.	At the start of the examination, please ensure that all pages of your booklet are properly printed; your question booklet is not damaged in any manner and contains 100 questions. In case of any discrepancy, report to the invigilator immediately. No claim in this regard will be entertained at the later stage.

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[SET-V]
MATHEMATICS

Marks: 100 **Time:** 2 hours

NOTE:

(i) Attempt all questions. Each question carries one mark. There will be **1/4th** negative marking.

(ii) **There are 100 questions in this booklet.** Against each question four alternative choices (A), (B), (C) and (D) are given, out of which only one is correct. Indicate your choice of answer by Darkening the suitable circle with **Black/Blue Ball Pen** in the OMR answer sheet supplied to you separately.

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1. The function $f(x)=\begin{cases}0 & , \ x \text{ is irrational}\\ 1 & , \ x \text{ is rational}\end{cases}$ **, is**

(A) continuous everywhere

(B) continuous at $x=0$ only

(C) continuous at $x=1$ only

(D) discontinuous everywhere

2. The function, $f(x)=\begin{cases}3x-5 & , \ x<3\\ x+1 & , \ x>3\\ K & , \ x=3\end{cases}$ **is continuous at** $x=3$ **if *K* is equal**

(A) 1

(B) 2

(C) 3

(D) 4

3. A single letter is selected at random from the word "PROBABILITY". Then the probability that it is a vowel is

(A) 3/11

(B) 4/11

(C) 7/11

(D) 8/11

4. If a matrix $A=\begin{pmatrix}1 & 0\\ 1/2 & 1\end{pmatrix}$ **, then** A^{50} **is equal to**

(A) $\begin{pmatrix}1 & 0\\ 0 & 50\end{pmatrix}$

(B) $\begin{pmatrix}1 & 0\\ 25 & 1\end{pmatrix}$

(C) $\begin{pmatrix}1 & 0\\ 50 & 1\end{pmatrix}$

(D) none of these

5. The rank of the matrix $\begin{bmatrix}1 & 3 & 4 & 2\\ 2 & 4 & 6 & 2\\ -1 & 5 & 4 & 6\end{bmatrix}$ **is**

(A) 1

(B) 2

(C) 3

(D) 4

6. The degree of nilpotence of the matrix $\begin{bmatrix}6 & 9\\ -4 & -6\end{bmatrix}$ **, is**

(A) Zero

(B) 1

(C) 2

(D) 4

7. The value of λ **, for which the system of equations** $x+y+z=5,\ x+2y+3z=9,\ x+3y+\lambda z=\mu$ **has unique solution, is**

(A) $\lambda=5,\ \mu=13$

(B) $\lambda=5,\ \mu\neq 13$

(C) $\lambda\neq 5$

(D) $\mu\neq 13$

8. Out of regression lines $3x+12y=9$, $3y+9x=46,$ **the regression line of** y **on** x **is**

(A) $3y+9x=46$

(B) $3y+9x=46$ *if* $y<x$

(C) $3x+12y=9$

(D) $3x+12y=9$ *if* $x>y$

9. Suppose a continuous random variable x has the probability density function as $f(x)=\begin{cases}1.5\left(1-x^2\right), & for\ \ 0<x<1\\ 0, & \text{otherwise}\end{cases}$, then $P\left(x>0.5\right)$ is

(A) 0.6125
(B) 0.3125
(C) 0.2625
(D) None of these

10. Let A and B be two events such that $P(A)=0.4,\ P(B)=p$ and $P\left(A\cup B\right)=0.6$. If A and B are independent, then the value of p is

(A) 1/3
(B) 1/2
(C) 1/4
(D) 2/7

11. 3 % of the electric bulbs manufactured by a company are defective. The probability that a sample of 100 bulbs has no defective bulb is given by

(A) $1+e^{-3}$
(B) $1-e^{-3}$
(C) $3e^{-3}$
(D) e^{-3}

12. If the lines of regression of Yon X and X on Y are $y=Kx+4\ and\ x=4y+5$ respectively, then

(A) $0\le K\le 4$
(B) $0\le K\le \frac{1}{4}$
(C) $K>\frac{1}{4}$
(D) None of these

13. The matrix of the relation $R=\{(a_1,b_1),(a_1,b_4),(a_2,b_2),(a_2,b_3),(a_3,b_1),(a_3,b_3)\}$ defined from the set $A=\{a_1,a_2,a_3\}$ to set $B=\{b_1,b_2,b_3,b_4\}$, is

(A) $\begin{bmatrix}1&0&0&1\\0&1&1&0\\1&0&1&0\end{bmatrix}$

(B) $\begin{bmatrix}0&1&0&0\\1&0&1&0\\1&1&0&1\end{bmatrix}$

(C) $\begin{bmatrix}1&0&1&0\\0&1&0&1\\0&1&0&1\end{bmatrix}$

(D) $\begin{bmatrix}1&2&1\\3&1&0\\1&0&2\end{bmatrix}$

14. If trace of the matrix $A=\begin{bmatrix}a&7\\2&b\end{bmatrix}$ is 8 and the product of the eigen values is 1, then the values of a and b are respectively

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

15. Let X be a set of 6 elements. How many relations on X are reflexive?

(A) 2^6
(B) 2^{36}
(C) 6^2
(D) 6

16. Let U and W be two subspaces of a vector space V. The sum U+W is a direct sum of U and W if

(A) U ∩ W = ϕ
(B) U ∩ W = {0}
(C) U ∩ W ≠ {0}
(D) (D)U ∩ W ≠ ϕ

17. Let $\wp_3(x)$ denotes set of real valued polynomials having degree atmost 3 and let $W=\{p\in\wp_3(x)\mid p(1)=0\}$, then the dimension of subspace W is

(A) 1
(B) 2
(C) 3
(D) 4

18. If T linear transformation $T:R^2\to R^2$, such that $T(1,2)=(3,1)$ and $T(1,-1)=(1,2)$, then the value of $T(4,2)$ is given by

(A) (8,6)
(B) (6,8)
(C) (8,8)
(D) None of these

19. For any positive real number x, the value of the integral $\int_0^1 \text{Arg}(-x)\,dx$ is

(A) $\pi/4$
(B) $\pi/6$
(C) $\pi/2$
(D) π

20. A feasible solution which optimizes the objective function of an LPP is called

(A) optimum solution
(B) optimal value
(C) optimal function
(D) None of these

21. Which of the following statements is correct?

(A) Every LPP admits an optimal solution.
(B) A LPP admits a unique optimal solution.
(C) If a LPP admits two optimal solutions, then it has an infinite number of optimal solutions.
(D) The set of all feasible solutions of a LPP is not a convex set

22. Which of the following sets is not convex?

(A) $\{(x, y) \mid x \geq 2,\ y \leq 3\}$
(B) $\{(x, y) \mid 3x^2 + 2y^2 \leq 6\}$
(C) $\{(x, y) \mid y^2 \leq x\}$
(D) $\{(x, y) \mid 3 \leq x^2 + y^2 \leq 5\}$

23. Which of the following relations between the operators is wrong?

(A) $\Delta = (I - \nabla)^{-1} - 1$
(B) $E = \dfrac{I}{I - \nabla}$
(C) $\delta = \dfrac{\nabla}{\sqrt{I - \nabla}}$
(D) $\Delta = \dfrac{\nabla}{I + \nabla}$

24. The Newton-Raphson method, for finding the roots of the equation $f(x) = 0$ converges, if

(A) $|f(x)f'(x)| < |f''(x)|^2$
(B) $|f(x)f''(x)| < 2|f'(x)|^2$
(C) $|f(x)f''(x)| < |f'(x)|^2$
(D) none of these

25. If $\Delta^3(1 - ax)(1 - 3x)(1 - 4x) = 72$ and unity as the interval of differencing, then a is equal to

(A) -1
(B) 1
(C) 2
(D) none of these

26. If $x = \xi$ is a double root of the equation $f(x) = 0$, then the iterative formula $x_{n+1} = x_n - \dfrac{f(x_n)}{f'(x_n)}$ converges

(A) Linearly
(B) Quadratically
(C) cubically
(D) None of these

27. For the Lagrange's interpolation formula $P_n(x) = \sum_{i=0}^{n} l_i(x)\ f_i$, an important check during the calculation is

(A) $\sum_{i=0}^{n} l_i(x) = 0$
(B) $\sum_{i=0}^{n} l_i(x) = 1$
(C) $\sum_{i=0}^{n} l_i(x) = cons\tan t$
(D) $\sum_{i=0}^{n} l_i(x) = 2$

28. Which of the following is Newton-Raphson's algorithm for finding the cube root of unity of a natural number "N"?

(A) $x_{n+1} = x_n - \dfrac{3x^2}{x_n^3 - N}$
(B) $x_{n+1} = \dfrac{1}{3}\left[2x_0 - \dfrac{N}{x_0^2}\right]$
(C) $x_{n+1} = \dfrac{1}{3}\left[2x_n + \dfrac{N}{x_n^2}\right]$
(D) None of these

29. For certain function $f(x)$, divided differences are given as $f[-1]=2,\ f[-1,1]=1,\ f[-1,1,2]=2$. Then the value of $f[2]$ is

(A) 11
(B) 12
(C) 14
(D) 13

30. The function $e^{\alpha x}\cos\beta x$ is harmonic function

(A) *for all values of* α *and* β
(B) *for* $\alpha^2+\beta^2=0$
(C) *for* $\alpha^2-\beta^2=0$
(D) None of these

31. If $f(z)=z\ \mathrm{Re}(z)$, then $f(z)$ is differentiable

(A) *for all values of* z
(B) *only for* $z=0$
(C) *only at* $z=1$
(D) None of these

32. Let $n\in I$. Then *cos* z_1 = *cos* z_2 if and only if z_1+z_2 or z_1-z_2 is

(A) an integral multiple of π
(B) an integral multiple of 2π
(C) an integral multiple of πi
(D) None of these

33. Let the two masses m_1 and m_2 are connected by an inextensible string of Length 'L'. Suppose x be the variable vertical distance from the pulley to mass m_1 and mass m_2 is at a distance of $L-x$ from the pulley, then Langrangian equation of motion is

(A) $\ddot{x}=\dfrac{m_1-m_2}{m_1+m_2}g$

(B) $\ddot{x}=\dfrac{m_1+m_2}{m_1-m_2}g$

(C) $\ddot{x}=\dfrac{m_1-m_2}{m_1+m_2}$

(D) $\ddot{x}=\dfrac{2m_1}{m_1+m_2}g$

34. Radial components of the acceleration of a particle is moving along a spiral $r=2e^{3\theta}$ with constant angular velocity ω is

(A) $6\omega^2e^{3\omega t}$
(B) $20\omega^2e^{3\omega t}$
(C) $16\omega^2e^{3\omega t}$
(D) None of these

35. Time period for a simple pendulum of length l is

(A) $\pi\sqrt{\dfrac{l}{g}}$

(B) $2\pi\sqrt{\dfrac{l}{g}}$

(C) $2\pi\sqrt{\dfrac{g}{l}}$

(D) None of these

36. Given the functional $\int_a^b \dfrac{y'^2}{x^3}dx$

(A) the extremal is $y=\dfrac{x^4}{4}+c_1$
(B) the extremal is $y=cx^2+c_1$
(C) the extremal is y = sinx
(D) the extremal is y=cosx

37. If X is a metric space, and E be subset of X, then

(A) $E=\bar{E}$ if and only if E is closed.
(B) $E=\mathrm{int}\,A$ if and only if E is open.
(C) both (A) and (B) are true
(D) None of these is true

38. Let $\lim_{n\to\infty} f_n(x)=f(x)$; *for all x on a set E* and if $M_n=\sup_{x\in E}|f_n(x)-f(x)|\to 0$ *as* $n\to\infty$.

Then,

(A) $f_n\to f$ uniformly on E.
(B) The series $\sum f_n$ always converges uniformly on E.
(C) both (A) and (B) hold
(D) None of these hold

39. Which of the following statement is true?

(A) Every closed subset of a compact metric Space is Compact

(B) Every compact metric space is Separable.

(C) Every compact metric space is complete and totally bounded..

(D) All of these are true

40. Which of the following is not correct?

(A) Every continuous function is R-integrable.

(B) Every bounded function is R-integrable.

(C) If is R-integrable on a [a,b], then $\left| f \right|$ is also R- integrable .

(D) None of these is correct

41. The value of $\int_0^3 [x]\,dx$ **, is**

(A) 1

(B) 2

(C) 3

(D) None of these

42. Which of the following is not Riemann integrbleon $[0,1]$**.**

(A) $f(x) = |x|$

(B) $f(x) = \begin{cases} 1 & x \in rational \\ 0 & x \in irrattional \end{cases}$

(C) $f(x) = [x]$

(D) all of above

43 The value of the line integral $\oint_C (-y^2\,dx + x\,y\,dy)$, *where* C **is the square cut off from the first quadrant by the lines** $x = 1 \; and \; y = 1$ **,is**

(A) 1

(B) 3/2

(C) 1/2

(D) 5/2

44. Which of the following statement is correct?

(A) A continuous function is always of bounded variation.

(B) A continuous function f defined on [a,b] is of bounded variation if and only if it can be expressed as sum of two monotonic decreasing functions on [a,b].

(C) A bounded monotonic function is a function of bounded variation.

(D) None of these statements are correct.

45. Which of the following statement is true?

(A) Any set with outer measure different from zero is uncountable.

(B) The set is [0,1] countable.

(C) The canter set C is uncountable with outer measure different from zero .

(D) None of these is true.

46. The set of all complex numbers $z \; such \; that \; |z| \le 1$ **is**

(A) open

(B) neither open nor closed

(C) Both closed and open

(D) closed

47 The integral $\oint_C \frac{1}{z^2}\,dz$ **, where the contour C is the ellipse** $(x-2)^2 + \frac{1}{4}(y-5)^2 = 1$ **has the value**

(A) zero

(B) (B) πi

(C) (C) 2π

(D) none of these

48. The image of the disk $|z-1| \le 1$ **under the mapping** $w = \frac{1}{z}$ **,in the w plane is**

(A) half-plane $u \ge \frac{1}{2}$

(B) half-plane $u \le \frac{1}{2}$

(C) the circle $\left| w \right| \le 1$

(D) none of these

49. The set of points $z \in C$ **for which** $|z-2| + |z+2i| = 4,$ **is the conic**

(A) hyperbola

(B) ellipse

(C) square

(D) None of these

50. The upper bound , for the absolute value of the integral $\oint_C \frac{e^z}{z+1} dz$, where C is the circle $|z|=4$, is

(A) $\frac{8}{3}\pi e^4$

(B) $\frac{1}{3}\pi e$

(C) $8\pi e^4$

(D) None of these

51. The function $w = e^z$ is

(A) periodic but not entire

(B) entire non-periodic

(C) neither entire nor periodic

(D) entire and periodic

52. The function $\cos(kz+23)$ is 1/2 periodic. Then k is equal to

(A) 1

(B) 2

(C) 4π

(D) $4\pi i$

53. Let f be Lebesgue integrable function. Then which of the following hold?

(A) $|f|$ is always Lebesgue integrable

(B) f is Riemann integrable also.

(C) both (A) and (B) are correct

(D) None of these hold

54. The value of the integral $\int_C z^2 dz$, where C is the line segment joining (0,0) and (1,1) is

(A) zero

(B) $(1+i)^3/3$

(C) $(1-i)/3$

(D) None of these

55. The residues at all the singular points of the function $f(z) = \frac{z^2}{z^2-2z+2}$ are given by

(A) 1,2

(B) 1 , 1

(C) 3, 2

(D) None of these

56. The bilinear transformation $w = \frac{az+b}{cz+d}$, whose fixed points are $i, -i$, is represented by

(A) $w = \frac{z-c}{z+c}$

(B) $w = \frac{az-c}{cz+a}$

(C) $w = \frac{z+c}{z-c}$

(D) None of these

57. Which of following statement (s) is correct?

(A) If function $f(z) = u + iv$ satisfies C-R equations at a point then f is differentiable at that point.

(B) The branch of $w = Log(z+4-i)$ is $x \le -4, y = 0$

(C) The function $e^{\bar{z}}$ is analytic at z = 0

(D) The function $\sin \bar{z}$ is nowhere analytic.

58. The coefficient b_n in the Fourier Series expansion of the function

$$f(x) = \begin{cases} 1+\frac{2x}{\pi}, & \text{for all} \quad -\pi \le x \le 0 \\ 1-\frac{2x}{\pi}, & \text{for all} \quad 0 \le x \le \pi \end{cases}$$ **, is**

(A) $\frac{1}{n\pi}((-1)^n - 1)$

(B) $\frac{1}{n^2\pi^2}((-1)^n - 1)$

(C) 0

(D) None of these

59. The matrix (T: B_1, B_2) associated with the linear transformation T: $R^2 \to R^2$ defined by T$(x, y) = (x, -y)$ relative to the basis B_1 = {(1,0),(0,1)} and B_2={(1,1),(1,-1)} is

(A) $\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$

(B) $\begin{pmatrix} \frac{1}{2} & 0 \\ 0 & \frac{1}{2} \end{pmatrix}$

(C) $\begin{pmatrix} \frac{1}{2} & \frac{1}{2} \\ \frac{1}{2} & -\frac{1}{2} \end{pmatrix}$

(D) $\begin{pmatrix} \frac{1}{2} & -\frac{1}{2} \\ \frac{1}{2} & \frac{1}{2} \end{pmatrix}$

60. Which of the following subsets of R^3, under the usual operations of addition and scalar multiplication, is a subspace of R^3?

(A) $U = \{(x, y, z) \mid xy = 0\}$

(B) $U = \{(x, y, z) \mid x + y + z \geq 0\}$

(C) $U = \{(x, y, z) \mid x^2 + y^2 + z^2 \leq 1\}$

(D) None of these

61. A function f defined on a measurable set E of finite measure is Lebesgue integrable if f is

(A) bounded and measurable

(B) unbounded and measurable

(C) bounded and non measurable

(D) None of these

62. The differential equation $xy' + 2y\cos y = 1$ is

(A) First order, linear and non homogeneous.

(B) First order, nonlinear and homogeneous.

(C) First order, linear and homogeneous.

(D) First order, nonlinear and non homogeneous

63. The Partial Differential Equation (PDE) $\frac{\partial^2 u}{\partial x^2} + 3\frac{\partial^2 u}{\partial x\, \partial y} + \frac{\partial^2 u}{\partial y^2} = 0$, is

(A) Hyperbolic

(B) Elliptical

(C) Parabolic

(D) (D)None of these

64. The particular integral of PDE $(4D^2 + D'^2 - 4DD')z = \sin(x + 2y)$ is

(A) $\frac{-x^2}{8}\sin(x + 2y)$

(B) $\frac{x^2}{8}\sin(x + 2y)$

(C) $\frac{x^3}{8}\sin(x + 2y)$

(D) None of these

65. If Wronskian of two solutions of equation $\frac{d^2y}{dx^2} + P(x)\frac{dy}{dx} + Q(x)\, y = 0$ is identically Zero on a [a,b], then the solutions are

(A) Linearly dependent

(B) Linearly independent

(C) Linearly dependent if one or both solutions are zero

(D) Can't say

66. Any differential equation $\frac{dy}{dx} = f(x, y)$ represents a

(A) A curve such that tangent to the curve at any point is having slope equal to value of f at that point

(B) A family of curve such that tangent to the curve at any point is having slope equal to value of f at that point

(C) A family of curve such that through every point of *xy*-plane, there passes more than one curve of the family

(D) A family of surfaces

67. If $\frac{1}{x}$ is a one of the solution of the differential equation $x^2y'' + 4xy' + 2y = 0$, then the second linearly independent solution is

(A) $-1/x$

(B) $-1/x^3$

(C) $-1/x^2$

(D) None of these

68. The singular integral of PDE $z = px + qy + \log pq$ is

(A) $z = 1 - \log xy$

(B) $z = 1 + \log xy$

(C) $z = -2 - \log xy$

(D) None of these

69. The general solution of PDE $p\sqrt{x}+q\sqrt{y}=\sqrt{z}$ is

(A) $x-y=f(z-x)$

(B) $\sqrt{x}-\sqrt{y}=f(\sqrt{x}-\sqrt{z})$

(C) $\sqrt{x}+\sqrt{y}=f(\sqrt{x}+\sqrt{z})$

(D) None of these

70. The complete integral of PDE $x+y=p^2+q^2$ is

(A) $z=(x+a)^{1/3}+(y-a)^{1/3}+C$

(B) $z=\frac{2}{3}(x+a)^{1/3}+\frac{2}{3}(y-a)^{1/3}+C$

(C) $z=\frac{2}{3}(x+a)^{3/2}+\frac{2}{3}(y-a)^{3/2}+C$

(D) None of these

71. The values of a, b, c for which is the motion defined by the vector field $\vec{V}=(x+y+az)i+(bx+2y-z)j+(x+cy+2z)k$, is irrotational ?

(A) 1, 1 , -1

(B) -1 , 1 , -1

(C) 1, -1 , -1

(D) None of these

72. Consider IVP $dy/dx=f(x,y), y(x_0)=y_0$ on rectangle $R:|x-x_0|\le a, |y-y_0|\le b$ where $a,b>0$. If $f(x,y)$ is not continuous in R and does not satisfy the Lipschitz condition $\forall(x,y)$ in R then

(A) Solution can exist and it can be unique

(B) Solution will always exist and will be unique

(C) Solution will always exist but it will not be unique

(D) Solution can exist but it will not be unique.

73. The orthogonal trajectory of the family of the curves $xy=C$ is

(A) $x^2+y^2=$ constant

(B) $x^2-y^2=xy$

(C) $x^2-y^2=$ constant

(D) $x^2+y^2=xy$

74. A cyclic group with only one generator can have

(A) at most 2 elements

(B) (B)a finite number of elements

(C) a prime number of elements

(D) None of these

75. Which of the following statements is correct?

(A) All finite groups are cyclic

(B) All infinite groups are not cyclic

(C) An infinite cyclic group has only two generators

(D) None of these

76. The order of cyclic subgroup generated by 25 in the cyclic group Z_{30} is

(A) 2

(B) 6

(C) 4

(D) None of these

77. A group of order 45 has a normal subgroup of order

(A) 3

(B) 9

(C) 5

(D) None of these

78. If "R" is a commutative ring with unit element , then

(A) every maximal ideal is prime ideal

(B) every prime ideal is maximal ideal

(C) every ideal is prime ideal

(D) None of these

79. Which of the following statement(s) is incorrect?

(A) every field is a ring

(B) every ring is a group

(C) every integral domain is a field

(D) every field is an integral domain

80. If every element of a group G is its own inverse, then the group G is

(A) finite

(B) abelian

(C) cyclic

(D) None of these

81. There are 10 lamps in a hall. Each one of them can be switched on independently. The number of ways in which hall can be illuminated is

(A) 10^2
(B) 1023
(C) 2^{10}
(D) 10!

82. What is (?) in the following table?

8	**54**	**27**
9	**71**	**?**
10	**90**	**45**

(A) 39
(B) 37
(C) 35.5
(D) 34.5

83. If 'THIS MAN IS GOOD' is coded as 153. What will be the code for 'THAT MAN IS NOT GOOD'?

(A) 200
(B) 195
(C) 190
(D) 180

84. A earned Rs 84000. One third of it went to taxes. The rest was invested and appreciated by one half. Two third of that went into business. Additional tax was paid equal to 2/3 of the remaining amount. How much money was left with A?

(A) 8790
(B) 8777
(C) 9000
(D) 9333

85. If Aneesh is paternal first cousin of Rahul, how is their father's mother is related to them?

(A) Mother
(B) Grandmother
(C) Paternal aunt
(D) Maternal aunt

86. I got my first job on May 22, 1983. Which day of the week it was?

(A) Monday
(B) Tuesday
(C) Friday
(D) Sunday

87. A petrol dealer adds 20% kerosene oil to petrol. If purchase price of petrol is Rs. 60 per litre and that of kerosene is Rs. 20 per litre, and sale price of the petrol is Rs. 61 per litre, what is his percentage profit?

(A) 14.25
(B) 14.37
(C) 14.50
(D) 14.70

88. Anant parked his motorcycle at 9^{th} place from the left and 28^{th} from the right. How many motorcycles are parked in the row?

(A) 37
(B) 36
(C) 35
(D) 34

89. In an imaginary language digits 0, 1, 2, 3, 4, 5, 6, 7 ,8 and 9 are substituted by t, d, j, o, r, m, u, x, b and z. 10 is written as dt and so on. Use the above information and find the value of expression given below:

{(or – dj) x u} ÷ dj

(A) 9
(B) 10
(C) 11
(D) 12

90. Seven friends meet at their college reunion, shake hand with each other once. How many hand shake will be there altogether?

(A) 21
(B) 42
(C) 27
(D) 49

91 Ms Anandita starts at left and moves 8 Kms. She then turns right and moves 4 Kms. Then she turns right again for 8 Kms. How far is she from the initial position?

(A) 20 Kms
(B) 10 Kms
(C) 08 Kms
(D) 04 Kms

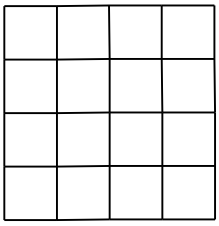
92. Lunch-dinner pattern of a person for 'm' days is given below. He has a choice of VEG or NON-VEG meal for his lunch/dinner.

(i) If he takes a NON-VEG lunch, he will have only VEG dinner
(ii) He takes NON-VEG dinner for 9 days
(iii) He takes VEG lunch for 11 days
(iv) He takes a total of 14 NON-VEG meals

What is 'm'?
(A) 18
(B) 20
(C) 24
(D) 38

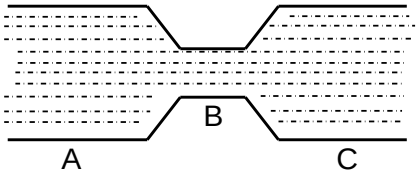
93. 20% students of a particular course get jobs within one year of passing. 20% of the remaining students get jobs by end of the second year of passing. If 16 students are still jobless, how many students had passed the course?
(A) 25
(B) 50
(C) 62
(D) 84

94. How many rectangles (which are not squares) in the following figure?:



(A) 56
(B) 70
(C) 80
(D) 96

95. Water is flowing through a tube as shown below:



The cross-sectional area of A and C are equal and greater than the cross-sectional area of B. If the flow of water is steady, than the pressure on the walls at B is
(A) less than that at A and that at C
(B) more than that at A and that at C
(C) same as that at A and that at C
(D) more than that at A but less than that at C

96 Processor IC chip was developed by?
(A) AMD
(B) Intel
(C) DIX
(D) Both (A) and (B)

97 If 5472 = 9, 6342 = 6, 7584 = 6. What is 9236?
(A) 2
(B) 3
(C) 4
(D) 5

98 Chipko movement was started by?
(A) Arundhati Roy
(B) Medha Patkar
(C) Ila Bhatt
(D) Sunder lal Bahuguna

99 What is the following is not a natural hazard?
(A) Earthquake
(B) Tsunami
(C) Flash floods
(D) Nuclear accident

100 Which of the following team won the 9th IPL cricket T-20 tournament?
(A) Kolkata Knight Riders
(B) Sun Risers Hyderabad
(C) Mumbai Indians
(D) Royal Challengers Bangalore