Examination: **M.Sc 5 Yr Integ M.Sc Prog Maths**
Computer Science Statistics

SECTION 1 - SECTION 1

Question No.1

_____ Output device is used for printing building plan, flex board, etc.

- Plotter
- Dot matrix
- Thermal printer
- inkjet printer

Question No.2

Let $x_n = \frac{n!}{n^n}$ and $y_n = n!^{1/n}$ be two sequences of real numbers. Then

- (x_n) converges and (y_n) diverges
- (x_n) diverges and (y_n) converges
- (x_n) and (y_n) both converges
- (x_n) and (y_n) both diverges

Question No.3

Which one of the following is not a cyber attack

- Ransomware
- Firmware
- Spyware
- Worms

Question No.4

If for a binomial distribution B(n,p) mean=4, variance=4/3, then P(X≥5) is:

- $\left(\frac{1}{3}\right)^6$
- $4\left(\frac{2}{3}\right)^6$
- $\left(\frac{2}{3}\right)^6$
- $\left(\frac{2}{3}\right)^5\left(\frac{1}{3}\right)$

Question No.5

Which one of the following is an Impact printer?

- Inkjet printer
- Thermal Printer
- Laser printer
- Dot matrix Printer

Question No.6

Choose the correct option.

- C is an interpreter and Python is an interpreter
- C is a compiler and Python is a compiler
- C is a compiler and Python is an interpreter
- C is an interpreter and Python is an assembler

Question No.7

Let $f : [0, 1] \to [0, 1]$ be a continuous function. Then the set $\{x \in [0, 1] | f(x) = x\}$ is

- always finite
- empty
- (0, 1)
- non empty

Question No.8

Given that P(A)=1/3, P(B)=1/4 and P(A/B)=1/6, then P(B/A) equals to

- 1/4
- 3/4
- 2/3
- 1/8

Question No.9

Probability that A speaks truth is 4/5. When a coin is tossed A reports that a head appears. The probability that actually there was head is:

- 4/5
- 1/5
- 1/2
- 2/5

Question No.10

The probability of a shooter hitting a target is 3/4. The minimum number of times must he/she fire so that the probability of hitting the target at least once is more than 0.99 is:

- 6
- 1
- 3
- 4

Question No.11

Let f be a continuous real valued function on $[0, 1]$ with $\int_0^1 f(t)dt = 0$. Then

- $|f| = 0$.
- $f = 0$.
- $\int_0^1 f(t)^2 dt = 0$
- $f = 0$ if $\forall t \in [0, 1], f(t) \leq 0$

Question No.12

Which of the following collection of $n \times n$ forms a subspace of $M_n(\mathbb{R})$?

- All matrices that satisfy $A^2 = A$
- All matrices that satisfy $AA^T = I$
- All matrices that satisfy $A = -A^T$
- All invertible matrices

Question No.13

If A is a real $n \times n$ matrix and there exists an $x \in \mathbb{R}^n$ such that $x \neq 0$ and $Ax = x$, then

- A must be invertible
- 2 is not an eigenvalue of A + I
- A - I is singular
- A - I is invertible

Question No.14

The mean of the Binomial distribution $B\left(4, \frac{1}{3}\right)$ is:

- 5/6
- 2/3
- 1
- 4/3

Question No.15

Which one of the following is not categorized into Network topologies?

- Tree topology
- Bus topology
- Power topology
- Star topology

Question No.16

The probability that a student is not a swimmer is 1/5. Then the probability thatout of five students, four are swimmers is

- $\left(\frac{4}{5}\right)^4 \left(\frac{1}{5}\right)$
- ${}^5C_4\left(\frac{4}{5}\right)^4 \left(\frac{1}{5}\right)$
- ${}^5C_3\left(\frac{4}{5}\right)^4 \left(\frac{1}{5}\right)$
- ${}^5C_2\left(\frac{4}{5}\right)^4 \left(\frac{1}{5}\right)$

Question No.17

Given three identical boxes I, II and III, each containing two coins. In box I, both coins are gold coins; in box II, both are silver coins and, in the box III, there is one gold and one silver coin. A person chooses a box at random and

takes out a coin. If the coin is of gold, the probability that the other coin in the box is also of gold is:

- 1/3
- 2/3
- 0
- 1/2

Question No.18

Let $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$ be a real matrix and $a \neq d$. If $A^2 + A + I = 0$, then

- a - d = -1
- a - d = 1
- a + d = 1
- a + d = -1

Question No.19

The Boolean laws A + A = A and A . A = A is called

- Indempotence
- Identity
- Involution
- Absorption

Question No.20

Which of the following is a subspace of all polynomials with real coeffcients?

- All polynomials of degree ≤ 5
- $\{x^n | n \in \mathbb{N}\} \cup \mathbb{R}$
- All polynomials of degree ≥ 5
- All polynomials of degree 1

Question No.21

Which gate is called as the logical inverter

- AND
- NOT
- XNOR
- OR

Question No.22

Which one of the following is not a digital computer?

- Mainframe Computers
- Micro Computers
- Super Computers
- Analog Computers

Question No.23

Choose the correct name for the law A + B = B + A

- Commutative Law
- DeMorgan's Law
- Associative Law
- Identity law

Question No.24

Geometric mean is better than other means when,

- Both of them are zero
- One of them is negative
- Both the observations are positive
- One of the two observations is zero

Question No.25

The outcome of tossing a coin is a:

- Mutually exclusive event
- Simple event
- Complementary event
- Compound event

Question No.26

The correct relationship between A.M. (arithmetic mean), G.M. (geometric mean) and H.M. (harmonic mean) is

- $A.M.=G.M.= H.M.$
- $H.M.\geq.G.M. \geq A.M.$
- $A.M.\geq G.M. \geq H.M.$
- $G.M.\geq A.M. \geq H.M.$

Question No.27

Suppose that two cards are drawn at random from a deck of cards. Let X be the number of aces obtained. Then the value of E(X) is

- 2/13
- 37/221
- 5/13
- 1/13

Question No.28

If a fair coin is tossed 10 times, the probability ofatmost 6 heads is:

- 848/1024
- 53/62
- 34/56
- 4/7

Question No.29

It is given that it will rain today is 0:3 and it will not rain today and tomorrow is 0:8, then the probability that it rains today but not tomorrow is

- 0.2
- 0.1
- 0.7
- 0.5

Question No.30

Representation of -54 in two’s complement form (1 byte representation)

- 11001010
- 11001001

- 110111
- 110110

Question No.31

Let $f(x) = \begin{cases} \dfrac{1+x}{|1+x|} & \text{if } |x| < 1 \\ x^2 & \text{otherwise} \end{cases}$. Then

- f is discontinuous at -1
- f is not de ned at -1
- f is di erentiable every where
- f is continuous every where

Question No.32

Which one of the following is not a Server side Program?

- PHP
- ASP
- Java Script
- JSP

Question No.33

Let (x_n) be a real sequence. Consider the following statements:

(1) If $x_n \to x$ then $|x_n| \to |x|$.

(2) If $|x_n| \to |x|$ then $x_n \to x$.

(3) If $|x_n| \to 0$ then $x_n \to 0$.

- (1) and (2)
- (2) and (3)
- (1) and (3)
- Only (1)

Question No.34

Let A be a 2 X 2 real diagonal matrix with A^2 = I. The total number of such matrices are

- 8
- 1
- 4
- -1

Question No.35

HTML tags should be specified within

- <>
- ( )
- { }
- [ ]

Question No.36

Ogives for more than type and less than type of a distribution intersect at:

- mean

- median
- mode
- origin

Question No.37

The mean of the numbers obtained on throwing a die having written 1 on three faces, 2 on two faces and 5 on one face is

- 8/3
- 5
- 1
- 2

Question No.38

For any two events A and B, P(A-B) is:

- P(A)-P(B)
- P(B)-P(A)
- P(B)-P(AB)
- P(A)-P(AB)

Question No.39

Let G be a group. Which of the following statements are true?
(1)If x, y ϵ G with orders 2 and 3 respectively, then xy has order 6.
(2)If all elements of G are of nite order then G is a nite group.
(3)If G is abelian then all the subgroups are normal.
(4)If all subgroups of G are normal then G is cyclic.

- Only (2)
- Only (4)
- Only (3)
- Only (1)

Question No.40

Find the value of the expression 7+3*6/2-4

- -30
- 26
- 12
- 9

Question No.41

In a 250GB (Gigabytes) storage device (hard disk), find the total number of bytes can be stored in storage device.

- 250000000 bytes
- 268435456000 bytes
- 21,47,483,648 bytes
- 250000 bytes

Question No.42

Which one of the following is not in the category of communication channels?

- light band
- narrow band
- voice band
- broad band

Question No.43

Which one is the fastest memory

- main memory
- Register
- Hard Disk
- cache

Question No.44

Which of the following method is accepted for assignment?

- 5 = a = b = c = d;
- a = b = c = = d 5;
- a = b = c = d = 5;
- a = b = 5 = c = d;

Question No.45

Which of the following groups consist of only output devices?

- Plotter, Printer, Monitor
- Mouse, Printer, Monitor
- Keyboard, Printer, Monitor
- Scanner, Printer, Monitor

Question No.46

A grouped frequency distribution with uncertain first or last classes is known as:

- Discrete frequency distribution
- Inclusive class distribution
- Exclusive class distribution
- Open end distribution

Question No.47

If in an LPP, the solution of a variable can be made infinity large without violating the constraints, the solution is

- Unbounded
- Alternative
- Infeasible
- Optimal

Question No.48

In mathematics and computer programming, which is the correct order of mathematical operators ?

- Division, Multiplication, Addition, Subtraction
- Multiplication, Addition, Division, Subtraction
- Addition, Division, Modulus, Subtraction
- Addition, Subtraction, Multiplication, Division

Question No.49

Let y_1 and y_2 be two solutions of the equation $y'' + a(x)y' + b(x)y = 0$ where a and b are defined on the interval I. If the Wronskian $W(y_1, y_2)$ vanish at a point $x_0 \in I$, then

- Wronskian is identically zero on I
- $y_1 = y_2$
- y_1 and y_2 are linearly independent
- $y_1(x_0) = y_2(x_0)$

Question No.50

Let $f : \mathbb{R} \to \mathbb{R}$ be defined as $f(x) := |\sin x|$. Then

- f is not continuous on a countable subset of $\mathbb{R}$.
- f is differentiable on $\mathbb{R}$.
- f is continuous on $\mathbb{R}$ but differentiable on $\mathbb{R} \setminus \{0\}$
- f is not differentiable on a countable subset of $\mathbb{R}$

Question No.51

Choose the correct number system for the value 1E.8C

- Octal
- Decimal
- Binary
- Hexadecimal

Question No.52

Which one of the following is the volatile memory

- ROM
- PROM
- EPROM
- RAM

Question No.53

An infinite group in which all the elements are of finite order is

- $(Z, +)$
- $(\{z \in \mathbb{C} | z^n = 1 \text{ for some } n \in \mathbb{N}\}, \cdot)$
- $(GL_2(\mathbb{R}), \cdot)$
- $(\mathbb{R} \setminus 0, \cdot)$

Question No.54

The $\lim_{n\to\infty} \frac{n}{e^n}$ is

- ∞
- 1/e
- 0
- 1

Question No.55

If A and B are two matrices of same order, then AB=BA when A and B are

- Diagonal matrices
- Skew-symmetric matrices
- Square matrices
- Symmetric matrices

Question No.56

Two events are said to be independent if:

- both the events have only one common point
- each outcome has equal chance of occurrence
- one does not affect the occurrence of other
- there is no common point between them

Question No.57

Three coins are tossed simultaneously. Consider the event E ‘three heads or three tails’, F ‘at least two heads’ and G ‘at most two heads’, then the independent pairs of events are:

- (E, F)
- (E, G) and (F, G)
- (E,G)
- (F, G)

Question No.58

Let G be an abelian group of order 24. G has two distinct elements x and y of orders 6 and 8 respectively. Then order of xy is

- 12
- 8
- 6
- 24

Question No.59

If the equation $x^2 + px + \frac{p^2}{4} = 0$ has equal roots, then the value of p is

- 0, ± 4
- 0 only
- 0 and -4 only
- 0 and 4 only

Question No.60

Frequency of a variable is always:

- a real number
- an integer
- in fraction
- in percentage

Question No.61

Expand POST

- Power on Software Test
- Post on self Test
- Power on Self Text
- Power on Self Test

Question No.62

Let f(x) = cos(sin(x)) and g(x) = sin(cos(x)) then,

- both f and g are odd functions
- f is an even function and g is an odd function
- both f and g are even functions
- g is an even function and f is an odd function

Question No.63

Which of the following OS is a commercially licensed Operating system?

- REDHAT
- UBUNTU
- Windows
- FEDORA

Question No.64

Let $T : \mathbb{R}^3 \to \mathbb{R}^3$ be defined as $T((x_1, x_2, x_3)) = (x_2, x_3, x_1)$, then

- $T^2 = T$
- 0 is an eigenvalue of T
- 1 is not an eigen value of T
- T is invertible

Question No.65

Let $T : \mathbb{R}^3 \to \mathbb{R}^2$ be defined as $T((x_1, x_2, x_3)) = c(x_1 - x_2, x_2 - x_3)$, then which of the following is not true?

- $\dim Ker(T) = 1$ if $c \neq 0$
- $rank(T) = \dim Ker(T)$ if $c \neq 0$
- $\dim Ker(T) = 3$ if $c = 0$
- $rank(T) = 2$ if $c = 0$

Question No.66

For the binary value $(1101)^2$, what is the Hexadecimal equivalent?

- B
- C
- D
- A

Question No.67

Let $f : [0, 2\pi) \to \mathbb{R}$ is defined as $f(x) := \sin(x) + \cos(x)$. Then f is

- decreasing in $[0, \pi/4]$
- increasing in $[0, \pi]$
- decreasing in $[0, \pi]$
- increasing in $[0, \pi/4]$

Question No.68

Ten cards numbered 1 to 10 are placed in a box, mixed up thoroughly and then one card is drawn randomly. If it is known that the number on the drawn card is more than 3, the probability that it is an even number is:

- 5/7
- 2/5
- 3/5
- 4/7

Question No.69

The probability of all possible outcomes of a random experiment is always equal to:

- 1
- 0
- infinity
- -1

Question No.70

The maximum of sin(-2x) in [0; 2□] is

- 2
- 1
- -1
- 1/2

Question No.71

The dimension of the subspace of $M_n(\mathbb{R})$ that contains all $n \times n$ real matrices whose trace is 0 is

- n^2
- $n^2 - 1$
- n - 1
- $n^2 - n$

Question No.72

Sum of absolute deviations about median is:

- zero
- one
- maximum
- minimum

Question No.73

In a discrete series having 2K+1 observations, median is

- K^{th} observation
- $(K + 1)^{th}$ observation
- $(2K + 1)/2^{th}$ observation
- $(K + 2)/2^{th}$ observation

Question No.74

Let $\{u, v\}$ be a basis for $\mathbb{R}^2$. Then $\{au + bv, cu + dv\}$ is not a basis if

- the matrix $\begin{pmatrix} a & b \\ c & d \end{pmatrix}$ is singular.
- $\{(a, b), (c, d)\}$ is a bais of $\mathbb{R}^2$
- the matrix $\begin{pmatrix} a & b \\ c & d \end{pmatrix}$ is invertible
- (a, b) is orthogonal to (c, d)

Question No.75

Which of the following are true?
(1) Every group of order 4 is abelian.
(2) Every group of order 4 is cyclic.
(3) There are only two groups of order 4 upto isomorphism.

- (1) and (3)
- (2) and (3)
- Only (1)
- (1) and (2)

Question No.76

Which amongst this is not an octal number?

- 123
- 645
- 234
- 876

Question No.77

Three cards are drawn successively, without replacement from a pack of 52 well shuffled cards, the probability that first two cards are kings and the third card drawn is an ace is:

- 3/5425
- 3/5525
- 1/5425
- 2/5525

Question No.78

Which one of the following is not a microprocessor?

- 16-bit microprocessor
- 32-bit microprocessor
- 96- bit microprocessor
- 64-bit microprocessor

Question No.79

Local Area Network is

- A network which spans a physical area in the range of 5 and 50 km diameter that is larger than WAN.
- A network in which the devices are connected over a relatively short distance
- A computer network organized around an individual person
- A network which spans a large geographical area, often a country or a continent

Question No.80

A Microprocessor's performance is not depends on the _____ characteristic

- Clock speed
- Disk speed
- Instruction set
- Word size

Question No.81

If α, β and γ are the roots of the polynomial equation $x^3 + ax^2 + bx + c = 0$ then $\alpha^2 + \beta^2 + \gamma^2$ is

- $a^2 + b^2 + c^2$
- $a^2 - 2b$
- $a + b + c$
- $a^2 - 2b + a$

Question No.82

Let G be an abelian group and fix $1 < n \in \mathbb{N}$. Then which of the following is not a subgroup?

- $\{g \in G | o(g) = n\}$
- $\{g \in G | g^n = g\}$
- $\{g^n | g \in G\}$
- $\{g \in G | g^n = e\}$

Question No.83

If f and g are two polynomials. Then the set $\{x \in \mathbb{R} | f(x) = g(x)\}$ is

- finite
- finite only when $\deg f = \deg g$.
- infinite if $\deg f \neq \deg g$
- infinite

Question No.84

There is 80 percent chance that a problem will be solved by statistics student and 60 percent chance that the same problem will be solved by a mathematics student. The probability that atleast the problem will be

- 0.92
- 0.10
- 0.48
- 0.75

Question No.85

Let (x_n) and (y_n) be two convergent real sequences. Then $z_n := \exp(x_n + y_n)$ is a

- converges only when $x_n + y_n \to 0$
- converges only when $x_n \to 0$ and $y_n \to 0$
- convergent sequence
- divergent sequence

Question No.86

What is the approximate bandwidth of a typical voice signal?

- 3MHz
- 2MHz
- 3KHz
- 2KHz

Question No.87

If $f(x) = \begin{cases} 3x & \text{if } x \text{ is rational} \\ x-2 & \text{otherwise} \end{cases}$, be a function from $\mathbb{R}$ to $\mathbb{R}$. Then f is continuous at

- 0
- -1
- 2
- 3

Question No.88

Which type of booting is used, when a system restarts?

- Touch boot
- Real boot
- Warm booting
- Cold booting

Question No.89

Which one of the following is not a part of Central Processing Unit

- Hard disk
- Registers (internal memory)
- Arithmetic and Logic Unit
- Control Unit

Question No.90

Which of the following does not have a convergent subsequence.

- $\cos(2^n)$
- $(n\sin(n\pi))^n$
- $\cos(n)$
- $\sin(n^n)$

Question No.91

Find the decimal equivalent of the fractional binary sequence $(0.1011)_2$

- $(0.5055)_{10}$
- $(0.5825)_{10}$
- $(0.6875)_{10}$
- $(0.6825)_{10}$

Question No.92

The arithmetic mean of two numbers is 6.5 and their geometric mean is 6. The two numbers are:

- 9,6
- 9,4
- 7,6
- 9,5

Question No.93

Which of the following is not a valid variable name declaration?

- int _a3;
- int _3a
- int 3_a;
- int a_3;

Question No.94

If an integer needs 2 bytes of storage, then maximum values of an unsigned integer is

- 2^{15}
- 2^{15}-1
- 2^{16}
- 2^{16}-1

Question No.95

Suppose that two cards are drawn at random from a deck of cards. Let X be the number of aces obtained. Then the value of E(X) is:

- 1/13
- 5/13
- 2/13
- 37/221

Question No.96

Which of the following is a measure of central value?

- Range
- Mean deviation
- Median
- Standard deviation

Question No.97

Expand HTML

- Hyper Thread Markup Language
- Hyper Text Markup Language
- Hyper Text Meta Language
- Hyper Transfer Mackup Language

Question No.98

The glb and lub of $A = \{x \in \mathbb{R} | x^2 - 5x + 4 < 0\}$ are, respectively,

- -5 and 4
- -∞ and 0
- 2.5 and ∞
- 1 and 4

Question No.99

A distribution consists of three groups having 40,50 and 60 items with means 20,26 and 15 respectively. The mean of the distribution is:

- 20
- 22
- 25
- 18

Question No.100

The individual probabilities of occurrence of two events A and B are known, the probability of occurrence of both the events together will be:

- one
- increased
- zero
- decreased