

NATIONAL UNIVERSITY OF MODERN LANGUAGES
Faculty of Engineering & Computer Science
Department of Mathematics



Entry Test : BS (Mathematics)

Sample Paper

INSTRUCTIONS

- The duration of the test is 60 Minutes (1 Hour).
- This test has SIX Sections “A”, “B”, “C”, “D”, “E” and “F”.
- First THREE sections “A”, “B” and “C” are compulsory for all applicants.
- Choose either Section “D” or Section “E”, or Section “F”.
- A candidate has to score minimum 50% marks in aggregate to pass the test. Furthermore, a candidate is also required to score minimum of 30% marks in each of the sections he/she has attempted.
- Fill in the appropriate circles/ovals. Multiple entries will NOT be entertained.
- After completion of the test, you have to return Question Paper & Answer Sheet both to the invigilators.
- Calculators & Mathematical tables are NOT allowed.
- Answers to all sections are to be attempted on answer sheets, which are being provided separately with the question papers. Rough work can be done on the back side of answer book, extra sheets will also be provided.
- Make sure that you do NOT write or mark anything on the question paper and/or answer sheet otherwise this will lead to cancellation of your paper.
- Keep your mobile phone turned off. Any mobile phone found Active / ON will be confiscated and candidate will be disqualified from the test.

Section: A *MATHEMATICS* (35 questions)

Q No 1. $\sqrt{2}$ is _____ number.

- (a) a rational
- (b) an irrational
- (c) a prime
- (d) None

Q No 2. π is a

- (a) Whole number
- (b) Natural number
- (c) Rational Number
- (d) Irrational number

Q No 3. $Z - \bar{Z} = \dots\dots\dots$

- (a) Real number
- (b) Complex number
- (c) 0
- (d) -1

Q No 4. A set has objects.

- (a) Identical
- (b) Not well-defined
- (c) Distinct
- (d) None

Q No 5. The set $\{1, 2, 3\}$ and $\{2, 1, 3\}$ are

- (a) Equal
- (b) Equivalent
- (c) Different
- (d) Equal and Equivalent

Q No 6. If $A = \{ \}$ then $P(A) = \dots\dots\dots$

- (a) Empty set
- (b) $\{0\}$
- (c) $\{\Phi\}$
- (d) None

Q No 7. $A \cup B$ is defined as

- (a) $\{x \mid x \in A \vee x \in B\}$
- (b) $\{x \mid x \in A \wedge x \in B\}$
- (c) $\{x \mid x \in A \wedge x \in B\}$
- (d) None

Q No 8. 13. $A \cup \Phi = \dots\dots\dots$

- (a) A
- (b) Φ
- (c) u
- (d) None

Q No 9. Which one is linear function?

- (a) $\{(x, y) \mid y = mx + c\}$
- (b) $\{(x, y) \mid y = mx^2 + c\}$
- (c) $\{(x, y) \mid y^2 = mx + c\}$
- (d) (d) None

Q No 10. Trivial solution of homogeneous linear equation is

- (a) (1, 0, 0)
- (b) (0, 1, 0)
- (c) (0, 0, 1)
- (d) (0,0,0)

Q No 11. System of linear equations is inconsistent if

- (a) System has no solution
- (b) System has many solution
- (c) System has unique solution
- (d) None

Q No 12. Minimum number of equation for any system of equations is:

- (a) 2
- (b) 3
- (c) 4
- (d) 10

Q No 13. When discriminant = 0 then the roots are.....

- (a) Real and equal
- (b) Rational
- (c) Irrational and unequal
- (d) None

Q No 14. The dividend = (divisor) (Quotient) +

- (a) Quotient
- (b) Divisor
- (c) Remainder
- (d) None

Q No 15. The rational fraction $P(x)/Q(x)$ is proper rational fraction if.....

- (a) Degree of $P(x)$ = Degree of $Q(x)$
- (b) Degree of $P(x)$ < Degree of $Q(x)$
- (c) Degree of $Q(x)$ < Degree of $P(x)$
- (d) None

Q No 16. $(x - 1)^2 = x^2 - 2x + 1$ is.....

- (a) An equation
- (b) An inequality
- (c) An identity
- (d) None

Q No 17. Which term of the sequenced 3, 9, 15, ..., is 117

- (a) 19
- (b) 20
- (c) 21
- (d) 22

Q No 18. 10. The A. M. between a & b is

- (a) $(a + b) / 2$
- (b) $2ab / (a + b)$
- (c) $(a - b) / 2$
- (d) $\pm\sqrt{ab}$

Q No 19. A sequence is a function whose domain is the set of _____

- (a) Integers
- (b) Natural numbers
- (c) Rational numbers
- (d) None

Q No 20. For a positive integer n, $n! =$ _____

- (a) n^2
- (b) $n(n-1)(n-2)\dots3.2.1$
- (c) $n.n(n-1)\dots2.1$
- (d) $n.5.2.1$

Q No 21. How many words can be formed from the letters of the word 'ARTICLE' using all the letters

- (a) $7!$
- (b) 7P_6
- (c) nP_7
- (d) None

Q No 22. If a circle is divided into 360 equal parts then each part is called:

- (a) Radian
- (b) Degree
- (c) Minute
- (d) Quadrant

Q No 23. ' π ' is the ratio between ----- of the circle

- (a) Radius and angle
- (b) Diameter and arc length
- (c) Circumference & Diameter
- (d) Radius & circumference

Q No 24. Quadrant is a part of a revolution

- (a) $\frac{1}{3}$ rd
- (b) $\frac{1}{4}$ th
- (c) $\frac{1}{2}$
- (d) $\frac{1}{8}$ th

Q No 25. A function is not continuous at $x = c$ then it is called _____

- (a) Discontinuous
- (b) Stationary
- (c) Defined
- (d) None of these

Q No 26. The range of $\operatorname{cosec} x$ is

- (a) $[-1, 1]$
- (b) R
- (c) $R - \{x \mid -1 < x < 1\}$
- (d) $[0, 1]$

Q No 27. The slope of a line with inclination 180° is

- (a) 1
- (b) 0
- (c) -1
- (d) undefined

Q No 28. The distance of point (7, 3) from x-axis is:

- (a) 3
- (b) 7
- (c) -7
- (d) -3

Q No 29. Aslam bought a car valued at \$7700. One year later the car's value had decreased by $\frac{2}{7}$. What is the new value of the car?

- (a) \$2200
- (b) \$5500
- (c) \$9900
- (d) \$4400

Q No 30. Any real number $a =$

- (a) ia
- (b) $(0, a)$
- (c) $(a, 0)$
- (d) $(a, 1)$

Q No 31. The multiplicative inverse of $\frac{1}{2}$ is

- (a) 2
- (b) -2
- (c) 0
- (d) None of these

Q No 32. $2 + 2 - 2 \times 2 \div 2 = ?$

- (a) 0
- (b) 1
- (c) 2
- (d) 4

Q No 33. A rule that assigns each element $x \in X$ to unique element $y \in Y$ is called

- (a) Domain
- (b) Range
- (c) Function
- (d) Value

Q No 34. A clock strikes once at 1 o'clock, twice at 2 o'clock, thrice at 3 o'clock and so on. How many times will it strike in 24 hours?

- (a) 78
- (b) 136
- (c) 156
- (d) 196

Q No 35. 1^0 is equal to _____ .

- (a) -1
- (b) 0
- (c) 1
- (d) None of these

Section: B English (15 questions)

Q No 36. The Amazon in Brazil is ---- longest river in ---- South America.

- (a) the / -
- (b) - / the
- (c) - / -
- (d) the / the

Q No 37. ---- his friends speaks any English.

- (a) Both of
- (b) Some
- (c) All
- (d) Neither of

Q No 38. ---- drawings is different.

- (a) Each one of the
- (b) Very few
- (c) Every
- (d) All of

Q No 39. We could barely get any information at the airport. ---- people seemed to have ---- idea about the flights.

- (a) Many / any
- (b) A lot of / any
- (c) Only a few / some
- (d) Few / no

Q No 40. ---- teachers prefer a class that is fairly consistent in having pupils of the same level.

- (a) Each
- (b) Every
- (c) Neither
- (d) Most

Q No 41. I don't have _____ much time for reading _____ I would like to.

- (a) as / as
- (b) more / than
- (c) so / that
- (d) too / that

Q No 42. English is today the third _____ native language worldwide after Chinese and Hindi, with some 380 million speakers.

- (a) the most spoken
- (b) the more spoken
- (c) much spoken
- (d) most spoken

Q No 43. My students' sleepless nights became ---- as the finals approached.

- (a) so frequently
- (b) more frequent
- (c) as frequent
- (d) much more frequently

Q No 44. It is often said that the hyena is an aggressive animal, but in fact it is not _____ many people believe.

- (a) more vicious
- (b) so vicious that
- (c) as viciously as
- (d) so vicious as

- Q No 45.** The cupboard was _____ big _____ fit through the door, so we had to take it apart first.
- (a) too / to
 - (b) more / than
 - (c) so / that
 - (d) enough / to
- Q No 46.** The roots of the old tree spread out ---- thirty meters in all directions and damaged nearby buildings.
- (a) too much
 - (b) as much as
 - (c) so much
 - (d) so many as
- Q No 47.** According to the recent election's results, the Democrats are ---- of the four main political parties.
- (a) the smaller
 - (b) smallest
 - (c) much smaller
 - (d) the smallest
- Q No 48.** Ever since the use of natural gas became widespread, London isn't _____ a polluted city _____ it was ten years ago.
- (a) as / as
 - (b) such / as
 - (c) so / that
 - (d) more / than
- Q No 49.** The plot of the novel was _____ it was completely incomprehensible.
- (a) more complicated
 - (b) such complicated
 - (c) so complicated that
 - (d) much more complicated than
- Q No 50.** What is synonym of word Foray?
- (a) fire
 - (b) brightness
 - (c) dump-founded
 - (d) lineage

Section: C Physics (15 questions)

- Q No 51.** The branch of physics which deals with atomic nuclei is called
(a) Acoustics
(b) Thermodynamics
(c) Magnetism
(d) Nuclear physics
- Q No 52.** Silicon is abundantly obtained from:
(a) Water
(b) Metal
(c) Sand
(d) Stones
- Q No 53.** The number of base units are:
(a) Three
(b) Five
(c) Seven
(d) Nine
- Q No 54.** Which of the following is a derived quantity:
(a) Force
(b) Mass
(c) Length
(d) Time
- Q No 55.** Which of the following is SI base unit?
(a) gram
(b) slug
(c) Newton
(d) kilogram
- Q No 56.** Which one of the following is not a unit of length:
(a) Angstrom
(b) Micron
(c) Radian
(d) Light year
- Q No 57.** An alternate unit to kgms^{-1} is
(a) Js
(b) Ns
(c) Nm
(d) N
- Q No 58.** SI unit of pressure is
a) $N m^2$
b) $N^2 m$
c) $N m^{-2}$
d) $N^{-2} m$
- Q No 59.** The unit of force is _____ and its symbol is _____ which is the correct pair?
(a) Newton, n
(b) Newton, N
(c) newton, n
(d) newton, N

Q No 60. Significant figures in 0.000846 are

- (a) Six
- (b) Four
- (c) Seven
- (d) Three

Q No 61. A light year is a unit for

- (a) Time
- (b) Distance
- (c) Velocity
- (d) Time period

Q No 62. Which one is a vector:

- (a) Length
- (b) Volume
- (c) Velocity
- (d) Work

Q No 63. If the x-component of a vector is positive and y- component is negative, then resultant vector lies in which quadrant?

- (a). 1st quadrant
- (b). 2nd quadrant
- (c). 3rd quadrant
- (d). 4th quadrant

Q No 64. What is the shape of velocity time graph for constant acceleration?

- a) Straight line
- b) Parabola
- c) Inclined curve
- d) Declined curve

Q No 65. Which law of motion is also called law of inertia?

- a) 1st law
- b) 2nd law
- c) 3rd law
- d) 4th law

Attempt Either Section “D” OR Section “E” OR Section “F”

Section: D Computer Sciences (10 questions)

Q No:66 A keyboard is this kind of device:

- (a). Input
- (b). Output
- (c). Word Processing
- (d). None of these

Q No: 67 Which of the following refers to the fastest, biggest and most expensive computers?

- (a). Personal Computers
- (b). Supercomputers
- (c). Laptops
- (d). Notebooks

Q No:68 A collection of related information sorted and dealt with as a unit is a:

- (a). disk
- (b). data
- (c). file
- (d). floppy

Q No: 69 The error detected by a compiler is

- (a). Logical error
- (b). Syntax error
- (c). Logical and syntax error
- (d). Execution error

Q No: 70 BASIC is a

- (a). High Level Language
- (b). Low Level Language
- (c). Assembly Language
- (d). Graphical Language

Q No: 71 DTP stands for

- (a). Dynamic Transaction protocol
- (b). Dynamic Transformation protocol
- (c). Data Transformation protocol
- (d). Desk Top publishing

Q No:72 HTML is used

- (a). To create a web page in the internet
- (b). To compile the program written in high level language
- (c). To send hot mail As a protocol
- (d). To transfer hypertext from one computer to another

Q No:73 ____ is the another name given to a computer programmer

- (a). System engineer
- (b). Software designer
- (c). Computer scientists
- (d). Engineers

Q No:74 Spam is also called

- (a). Junk e-mail
- (b). spoof
- (c). sniffer
- (d). script spool

Q No:75 Which one of the following is not optical disk?

- (a). CD-ROM
- (b). WORM-CD
- (c). Hard Disk
- (d). OM-CD

Section: E Statistics (10 questions)

Q No: 66 If a dice is thrown then the probability of getting an odd number is ____

- (a) $1/6$
- (b) $1/2$
- (c) $2/6$
- (d) $5/6$

Q No:67 If A & B are mutually disjoint events then $P(A \cup B) =$ _____

- (a) $P(A) + P(B) - P(P \cap B)$
- (b) $P(A) - P(B)$
- (c) $P(A) + P(B)$
- (d) None

Q No:68 Accepting a false null hypothesis is an example of what?

- (a) Significance testing
- (b) Type 1 error
- (c) Experimenter bias
- (d) Type II error

Q No:69 If the standard deviation of a population is 9, the population variance is

- (a) 9
- (b) 3
- (c) 21
- (d) 81

Q No:70 The number of accidents in a city during 2010 is a

- (a) Discrete Variable
- (b) Continuous Variable
- (c) Qualitative Variable
- (d) None of these

Q No:71 In a five number summary, which of the following is not used for data summarization?

- (a) The smallest value
- (b) The largest value
- (c) The 25th percentile
- (d) The median

Q No:72 The sum of the percent frequencies for all classes will always equal

- (a) One
- (b) The number of classes
- (c) The number of items in the study
- (d) 100

Q No:73 In statistics out of 100, marks of 21 students in final exams are as 90, 95, 95, 94, 90, 85, 84, 83, 85, 81, 92, 93, 82, 78, 79, 81, 80, 82, 85, 76, 85 then mode of data is

- (a) 85
- (b) 95
- (c) 90
- (d) 81

Q No:74 Which of the following terms means the spread or dispersion of data (the positive square root of the variance)?

- (a) standard deviation (SD)
- (b) standard error (SE)
- (c) standard error of the estimate
- (d) standard error of the mean (SEM)

Q No:75 Which of the following terms means the ratio of the standard deviation to the mean?

- (a) coefficient of determination
- (b) coefficient of variation
- (c) correlation coefficient
- (d) criterion standard

Section: F Chemistry (10 questions)

Q No: 66 Covalent solids are composed of

- (a) ions
- (b) different molecules
- (c) neutral atoms
- (d) any of the above

Q No: 67 Carbon atoms of diamond are

- (a) sp hybridized
- (b) sp² hybridized
- (c) sp³ hybridized
- (d) unhybridized

Q No: 68 Quantum number value for 2p orbitals are

- (a) $n = 2, l = 1$
- (b) $n = 1, l = 2$
- (c) $n = 1, l = 0$
- (d) $n = 2, l = 0$

Q No: 69 In the ground state of an atom, the electron is present

- (a) in the nucleus
- (b) in the second shell
- (c) nearest to the nucleus
- (d) farthest from the nucleus

Q No: 70 A molecule having two atoms is called

- (a) monoatomic molecules
- (b) diatomic molecules
- (c) Polyatomic molecules
- (d) homoatomic molecule

Q No:71 Nickel has isotopes

- (a) 1
- (b) 3
- (c) 5
- (d) 7

Q No:72 Smallest particle of an element which may or may not have independent existence

- (a) a molecule
- (b) an atom
- (c) an ion
- (d) an electron

Q No:73 Science of the chemical characterization is under the heading of

- (a) industrial chemistry
- (b) experimental chemistry
- (c) analytical chemistry
- (d) physical chemistry

Q No:74 Several types of filter media are used for filtration depending on

- (a) nature of reaction
- (b) nature of reactants
- (c) nature of precipitate
- (d) nature of filter paper

Q No:75 Filtration by a glass funnel and filter paper is very

- (a) time consuming
- (b) difficult
- (c) fast
- (d) accurate