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## NATIONAL UNIVERSITY OF SCIENCE & TECHNOLOGY (NUST)

### Computer Sciences Sample Admission Test 03

#### MATHEMATICS

**Directions:** For each question below you are given four choices. SELECT ANY ONE THAT IS MOST APPROPRIATE ANSWER

**ALL ANSWER MUST BE GIVEN ON THE ANSWER SHEET.**

**YOUR ANSWERS MUST BE INDICATED BY LETTERS (A, B, C, D) AND NOT BY THE WORDS THEMSELVES.**

- If  $n$  is any positive integer then  $4^n > 3^n + 1$  is true for all
 

A) $n \leq 2$	B) $n < 3$
C) $n > 2$	D) $n \geq 2$
- If  $\sin \theta$  is in
 

A) I and III quadrants	B) II and III quadrants
C) I and II quadrants	D) II and IV quadrants
- If  $\sin \theta < 0$  then  $\theta$  is in
 

A) I quadrant	B) II quadrant
C) III quadrant	D) IV quadrant
- $\sec \left( a + \frac{\pi}{2} \right) =$  \_\_\_\_\_ .
 

A) $\sec a$	B) $\operatorname{cosec} a$
C) $-\sec a$	D) $-\operatorname{cosec} a$

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- $1 - \cos 2a =$  \_\_\_\_\_.
 

A) $2 \sin^2 a$	B) $2 \cos^2$
C) $2 \sec a$	D) None of these
- Period of  $\sin \frac{x}{3}$  is \_\_\_\_\_.
 

A) $\pi$	B) $3\pi$
C) $\frac{2\pi}{3}$	D) $6\pi$
- The Period of  $3 \sin \frac{x}{3}$  is \_\_\_\_\_.
 

A) $\pi$	B) $2\pi$
----------	-----------

- C)  $3\pi$  D)  $6\pi$
8.  $\cos \frac{a}{2} = \frac{\sqrt{s(s+a)}}{bc}$
- A)  $\sqrt{\frac{s(s+a)}{bc}}$  B)  $\sqrt{\frac{(s-b)(s-c)}{bc}}$
- C)  $\sqrt{\frac{s(s-a)}{bc}}$  D)  $\sqrt{\frac{(s+b)(s+c)}{bc}}$
9. Area of  $\Delta ABC =$  \_\_\_\_\_ .
- A)  $ab \sin a$  B)  $\frac{1}{2} ab \sin a$
- C)  $\frac{1}{2} ab \sin y$  D)  $\frac{1}{2} ab \sin \beta$
10. The solution of the equation  $1 + \cos x - 0$  is -----.
- A)  $\left\{ \frac{\pi}{2} + 2n\pi \right\} \cup \left\{ \frac{3\pi}{2} + 2n\pi \right\}, n \in Z$  B)  $\{ \pi + 2n\pi \}, n \in Z$
- C)  $\left\{ \frac{\pi}{4} + 2n\pi \right\} \cup \left\{ \frac{5\pi}{4} + 2n\pi \right\}, n \in Z$  D) None of these

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11. If  $f(x) = \sec x$  then  $f\left(\frac{\pi}{3}\right)$  is
- A) 0 B) 1
- C) 2 D)  $\frac{1}{2}$
12.  $f(x) = C$  is
- A) Identity function B) Constant function
- C) Linear function D) Quadratic function
13.  $\cos h^2 x + \sin h^2 x =$  -----.
- A)  $\sin h 2x$  B)  $-\sin h 2x$
- C)  $\cos h 2x$  D)  $-\cos h 2x$
14.  $\lim_{x \rightarrow 0} \frac{e^x - 1}{x} =$  -----
- A) e B) 1
- C)  $N a^{n-1}$  D)  $\log_e a$

15.  $\lim_{x \rightarrow \theta} \frac{1 - \cos \theta}{\theta} = \text{-----}$

- A) 0  
C) 2

- B) 1  
D) Does not exist

16. If  $f(x) = \frac{1}{x^2}$  then  $f'(x) = \text{-----}$ .

- A)  $-2x^3$   
C)  $-2x^{-3}$

- B)  $2x^{-3}$   
D)  $2x^3$

17. Derivative of  $x^3$  w.r.t.  $x^3$  is

- A) 0  
C)  $3x^2$

- B) 1  
D)  $x^3$

18.  $\frac{d}{dx}(2^x) = \text{-----}$

- A)  $2^x$   
C)  $2x \ln 2$

- B)  $2^x \ln x$   
D)  $\frac{2^x}{\ln 2}$

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19. If  $f(x) = \cos x$  then  $f'(\tan x) = \text{-----}$ .

- A)  $-\frac{1}{1+x^2}$   
C)  $\sec^2 x$

- B)  $-\operatorname{cosec}^2 x$   
D)  $-\cos^2 x$

20. If  $f(x) = \cos x$  then  $f'(0) = \text{-----}$ .

- A) 0  
C) -1

- B) 1  
D) None of these

21.  $\int \frac{dx}{ax+b} = \text{-----}$

- A)  $\ln |ax+b| + c$   
C)  $-a \ln |ax+b| + c$

- B)  $\frac{1}{a} \ln |ax+b| + c$   
D)  $-\frac{1}{a} \ln |ax+b| + c$

22.  $\int a^{\cos x} \sin x \, dx = \text{-----}$

- A)  $a^{\cos x} + c$

- B)  $-\frac{a^{\cos x}}{\ln a} + c$







- A) Maximum  
B) Minimum  
C) Equal to horizontal component of velocity  
D) Equal to initial velocity
9. The speed of efflux is equal to the velocity gained by the fluid in falling through the distance ( $h_1 - h_2$ ) under the action of gravity. This is the statement of  
A) Bernoulli's theorem  
B) law of continuity  
C) Fluid law  
D) Torricelli's theorem
10. Angular momentum is defined as  
A) The dot product of position vector and linear momentum  
B) The cross product of position vector and linear momentum  
C) The simple product of position vector and linear momentum  
D) The product of distance and linear momentum
11. Newton's Law of Gravitation states that the force of attraction between two bodies is directly proportional to  
A) Product of mass and distance between them  
B) Square of the distance between them  
C) Product of their masses  
D) Product of square of their masses

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12. If distance between two bodies is doubled and their masses are also doubled the gravitational force will  
A) Increase four times  
B) Decrease four times  
C) Remain constant  
D) Remain constant
13. The work done by a force acting on a body is maximum when  
A) The displacement is zero  
B) The force is parallel to the displacement  
C) The force is perpendicular to the displacement  
D) The force is anti-parallel to the displacement
14. If a force  $F$  moves a body with velocity  $V$  then power is  
A)  $F \cdot V$   
B)  $F \times V$   
C)  $F + V$   
D)  $F - V$
15. When transverse waves propagate through a medium then the particles of the medium  
A) Remain at rest  
B) Vibrate along the direction of propagation of waves  
C) Vibrate perpendicular to the direction of propagation of waves  
D) Vibrate at an angle of  $180^\circ$  with the direction of propagation of waves
16. When longitudinal waves propagate through a medium, then the particles of the medium  
A) Vibrate parallel to the direction of propagation of waves  
B) Vibrate perpendicular to the direction of propagation of waves

- C) Do not move at all  
D) Vibrate at an angle of  $270^\circ$  to the direction of waves
17. If a transverse wave has a speed of 100m/sec and frequency of 100 hertz then its wavelength will be  
A) 1 m  
B) 10 m  
C) 100 m  
D) 1000 m
18. When the speed of a fluid is high, its pressure  
A) no effect on pressure  
B) is also high  
C) is low  
D) equal to atmospheric pressure
19. Which of the following properties proves that light behaves as waves  
I. Interference  
II. Diffraction  
III. Refraction  
A) I and II are correct only  
B) II and III are correct only  
C) I and II are correct only  
D) I, II and III are correct
20. At high velocity the motion of a fluid becomes  
A) Streamed line  
B) Circular  
C) Oscillatory  
D) Turbulent

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21. Polaroid can be used  
A) To control head light glare in night driving  
B) To determine the concentration of optically active substance  
C) In curtain-less window to adjust the amount of light  
D) All of them
22. A lens which is thicker in the middle and thinner at the edge is called  
A) Concave lens  
B) Convex lens  
C) Plano-concave lens  
D) Convex-concave lens
23. A straight line passing through center of curvature of the two spherical surfaces of a lens is called  
A) Diameter of the lens  
B) Radius of the lens  
C) Principal axis  
D) Principle focus
24. A double convex lens acts as a diverging lens when the object is placed  
A) At the focus  
B) At  $2f$   
C) Between  $f$  and  $2f$   
D) Within the focal length
25. Temperature is property which determines  
A) How much total absolute energy a body has  
B) Fraction of heat removed from a body  
C) The ability of a body to transfer heat to  
D) How much heat a body contains



other bodies

26. It becomes difficult to recognize the beats, when the frequency difference of two waves is greater than
- |      |       |
|------|-------|
| A) 2 | B) 5  |
| C) 7 | D) 10 |
27. When the source of sound is moving towards the stationary listener, the frequency of the sound
- |                 |                  |
|-----------------|------------------|
| A) Remains same | B) decreases     |
| C) increases    | D) None of these |
28. Triple point of water is (in  $^{\circ}\text{C}$ )
- |        |           |
|--------|-----------|
| A) 0   | B) 273.16 |
| C) 100 | D) -273   |
29. When air at 300K and 1 atmospheric pressure is compressed to one-twentieth of its original volume and 30 atmospheric pressure, the new temperature will be
- |           |                     |
|-----------|---------------------|
| A) 9000 K | B) 100 K            |
| C) 450 K  | D) 450 $^{\circ}$ C |

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30. If a unit charge experiences a force of 10N at a point in an electric field, then the electric field intensity in N/C is
- |       |       |
|-------|-------|
| A) 8  | B) 9  |
| C) 10 | D) 11 |

## COMPUTER

**Directions:** For each question below you are given four choices. SELECT ANY ONE THAT IS MOST APPROPRIATE ANSWER

**ALL ANSWER MUST BE GIVEN ON THE ANSWER SHEET.**

**YOUR ANSWERS MUST BE INDICATED BY LETTERS (A, B, C, D) AND NOT BY THE WORDS THEMSELVES.**

- A way of physically organizing data on a disk pack to minimize seek time uses
  - sequential file
  - removable hard
  - the cylinder method
  - Winchester technology
- The speed with which a disk can find data being sought is called
  - access time
  - data transfer time
  - direct time
  - cylinder time
- The disk storage that uses both a magnet and a laser beam
  - hashing

- (b) magneto-optical
- (c) CD-ROM
- (d) WORM
- 4. Which is not a benefit of secondary storage?
  - (a) convenience
  - (b) DAT
  - (c) Economy
  - (d) Space
- 5. Before a sequential file can be updated the transactions must be first
  - (a) numbered
  - (b) labeled
  - (c) updated
  - (d) sorted
- 6. CD-ROM had the same format as
  - (a) backup tape
  - (b) DAT
  - (c) Diskette
  - (d) Audio compact disk
- 7. The ability to return a changed disk record to its original location is called
  - (a) magneto-optical
  - (b) rotational delay
  - (c) multimedia
  - (d) updating in place

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- 8. Processing transactions in groups is called
  - (a) data transfer
  - (b) head switches
  - (c) transaction processor
  - (d) batch processing
- 9. The presence of both data and its related instructions in an object is
  - (a) C+
  - (b) Encapsulation
  - (c) Orientation
  - (d) Inheritance
- 10. In preparing a program one should first
  - (a) plan the solution
  - (b) code the program
  - (c) document the program
  - (d) define the problem
- 11. During the development of a program drawing a flowchart is a means to

- (a) plan the solution
  - (b) code the program
  - (c) define the program
  - (d) analyze the problem
- 12.** An English like language that one can use as a program design tool is
- (a) BASIC
  - (b) Pseudo code
  - (c) PL/I
  - (d) Pascal
- 13.** In preparing a program desk-checking and translation are example of
- (a) coding
  - (b) planning
  - (c) testing
  - (d) documenting
- 14.** The process of detecting, locating and correcting logic errors is called
- (a) desk-checking
  - (b) translating
  - (c) debugging
  - (d) documenting
- 15.** Comments in the program itself are part of
- (a) compiling
  - (b) linking
  - (c) documenting
  - (d) translating

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## ENGLISH

*Directions:* For each question below you are givenr choices. SELECT ANY ONE THAT IS MOST APPROPRIATE ANSWER

### SENTENCE COMPLETION

**Directions for Q 1 - 3**

Each sentence below has one or two blanks, each blank indicating that something has been omitted. Beneath in sentence are five lettered words or sets of words. Choose the word or set of words that best fits the meaning of the sentence as a whole.

1. There was a hint of carelessness about her appearance, as though the cut of her blouse or the fit of her slacks was a matter of \_\_\_\_\_ to her.
 

A. satisfaction	B. Aesthetics
C. indifference	D. Significance
E. Controversy	
2. Many educators argue that a \_\_\_\_\_ grouping of students would improve instruction because it would limit the range of student abilities in the classroom.
 

A. heterogeneous	B. Systematic
C. homogeneous	D. Sporadic

- E. Fragmentary
3. As news of his indictment spread through the town, the citizens began to \_\_\_\_ him and to avoid meeting him.
- A. ostracize  
B. Congratulate  
C. desecrate  
D. Minimize  
E. Harass

## ANALOGY

**Direction:** Each question below consists of a related pairs of words or phrases, followed by five lettered pairs of words or phrases, Select the lettered pair that best expresses a relationship similar to that expressed in the original pair.

4. ASYLUM : SHELTER ::  
 (a) harbor : concealment  
 (b) palisade : display  
 (c) stronghold : defense  
 (d) hospice : exile
5. SCISSORS : SEVER ::  
 (a) scales : average  
 (b) barrel : roll  
 (c) eraser : smudge  
 (d) millstone : grind  
 (e) match : strike

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6. HONE : SHARP ::  
 (a) polish : shiny  
 (b) whet : blunt  
 (c) memorize : minor  
 (d) erode : moist  
 (e) varnish : sticky

## ANTONYM

**Direction:** In each of the following antonym questions, a word printed in capital letters precedes five lettered words or phrases. From these five lettered words or phrases, pick the one most nearly opposite in meaning to the capitalized word.

7. OWN:  
 (A) Outlay (B) Disclaim (C) Deny (D) Disobey
8. PENCHANT:  
 (A) Dislike (B) Attitude (C) Imminence (D) Distance
9. PROGRESS:  
 (A) Standard (B) Serious (C) Momentary (D) Interpretive
10. PROGRESS::  
 (A) Recede (B) Retrogress (C) Prosperity (D) Shrike

**READING COMPREHENSION**

**Direction:** Please read the passage below and answer the questions on the basis of what is stated or implied.

**Passage:**

It is difficult to reconcile the ideas of different schools of thought on the question of education. Some people maintain that pupils at school should concentrate on a narrow range of subjects which will benefit them directly in their subsequent careers. Others contend that they should study a wide range of subjects so that they have not only the specialized knowledge necessary for their chosen careers but also sound general knowledge about the world they will have to work and live in. Supporters of the first theory state that the greatest contributions to civilization are made by those who are most expert in their trade or profession. Those on the other side say that, unless they have a broad general education, the experts will be too narrow in their outlook to have sympathy with their fellows or a proper sense of responsibility towards humanity as a whole.

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**QUESTIONS**

- 11 Broad general knowledge is necessary because
- |                                      |  |
|--------------------------------------|--|
| A) It broadens one's outlook         | B) It teaches us about different things    |
| C) Without it no one would get a job | D) Specialization is incomplete without it |
- 12 Supporters of the first theory say that
- |  |   |
|--|---|
| A) Experts have contributed most to progress in the modern world | B) Experts have done nothing to help mankind                      |
| C) People with general knowledge are more useful than experts    | D) People with general knowledge have contributed to civilization |
- 13 Schools of thought can be explained as
- |   |   |
|---|---|
| A) Groups of people who are schooled to think | B) Groups of people whose job is to think                         |
| C) Groups of people having the same           | D) Groups of people who study in a particular school thoughtfully |
- 14 The idea of the first school of thought in the passage is that
- |   |   |
|---|---|
| A) Students should study a few subjects that will help them in their profession | B) Students should not undertake any specialized work |
| C) Students should not undertake any specialized work                           | D) Students should concentrate on studies             |
- 15 According to the second school of thought education will not be very effective if pupils
- |   |  |
|---|--|
| A) Have nothing but general knowledge   | B) Ignore the study of fine arts               |
| C) Do not have a wide general education | D) Have inadequate knowledge of their own work |

**END OF TEST**

**For Answer Key:** [www.entrytest.com/testprep/answers.aspx](http://www.entrytest.com/testprep/answers.aspx)

