NATIONAL UNIVERSITY OF SCIENCE & TECNOLOGY (NUST)

Computer Sciences Sample Admission Test 01

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.

1. Which of the following lists of physical quantities consists only of vectors:
   (a) Time, temperature, velocity
   (b) Force, volume, momentum
   (c) Velocity, acceleration, mass
   (d) Force, acceleration, velocity

2. If ($\vec{a} \times \vec{b}$) points along negative z-axis, then the vectors $\vec{a}$ and $\vec{b}$ must lie in
   (a) .zx-plane
   (b) .yx-plane
   (c) .xy-plane
   (d) None of the above

3. $k \times \hat{i} = $ ………
   (a) j
   (b) $-j$
   (c) k
   (d) $-k$

4. What must be changing when a body is accelerating uniformly along a straight path?
   (a) The force acting on the body
   (b) The velocity of the body
   (c) The mass of the body
   (d) The speed of the body

5. The horizontal range of a projectile is maximum when it is thrown at what angle with a certain velocity?
   (a) 30^0
   (b) 45^0
   (c) 60^0
   (d) 90^0

6. A paratrooper jumping out of an airplane is an example of
   (a) Equilibrium
   (b) Static Equilibrium
   (c) Dynamic Equilibrium
   (d) None

7. The torque on a body will be zero if the angle between $\vec{r}$ and F is zero or:
   (a) 90^0
   (b) 180^0
   (c) 270^0
   (d) None

8. If we go away from the surface of the earth, a distance equal to the one third of the radius of the earth, the value of g will be multiplied by?
   (a) 1/2
   (b) 9/16
   (c) 1/9
   (d) 16/9

9. For certain values F and d, work done is zero when the angle between the force and displacement is:
   (a) 0^0
   (b) 30^0
   (c) 90^0
   (d) 180^0

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10. The force acting on a body in the gravitational field at any point is equal to its:
    (a) Gravitational mass   (b) Weight   (c) Acceleration   (d) Inertia

11. What is kinetic energy of a body of mass 10 kg moving with velocity $1m/s^2$?
    (a) 10 Joules   (b) 20 Joules   (c) 5 Joules   (d) 2.5 Joules

12. Simple harmonic motion is mathematically represented as
    (a) $.a \, \alpha - x$ (b) $.a \, \alpha \, x$ (c) $V \, \alpha - x$ (d) $F \, \alpha - x$

13. The frequency of second pendulum is
    (a) 1 hertz   (b) 2 hertz   (c) 0.5 hertz   (d) None of the above

14. A body with frequency f would complete one vibration in
    (a) F seconds   (b) $\dfrac{1}{f}$ seconds   (c) 1 second   (d) $\dfrac{1}{T}$ seconds

15. The rate of evaporation depends upon:
    (a) Nature of liquid   (b) The temperature of liquid and air
    (c) The area of the exposed surface of the liquid   (d) All of the above

16. The saturated vapour pressure of a given liquids:
    (a) Increases with rise in temperature   (b) Decreases with rise in temperature
    (c) May increase or decrease with rise in temperature   (d) Remains unchanged with rise in temperature

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17. Suppose the co-efficient of linear expansion of copper is 0.000156 per degree C. What will be the co-efficient of volume expansion of copper sphere per degree C?
    (a) Same as that of linear expansion   (b) Two times as that of linear expansion
    (c) Three times as that of linear expansion   (d) One half as that of linear expansion

18. Length of metal rod is 100 cm and co-efficient of linear expansion of metal is $0.00002K^{-1}$ By how many centimeters will it contract when cooled through 50^0 C?
    (a) 1.001   (b) 0.150   (c) 0.001   (d) 0.01

19. The Coulomb force in a medium of relative permittivity ε_r is given by:
    (a) $F' = \dfrac{\varepsilon_r}{F}$ (b) $F' = \dfrac{F}{\varepsilon_r}$ (c) $F' = F_{\varepsilon_r}$ (d) $F' = \dfrac{F}{\varepsilon_0 \varepsilon_r}$

20. Capacity of a capacitor depends upon.
    (a) The distance between the plates   (b) The nature of the dielectric between the plates
    (c) The size of the plates   (d) All of the above

21. The magnetic force F_m acting on charge q when it moves with a velocity v through a magnetic field B is given by
    (a) $F_m = q \, v \times B$ (b) $F_m = q \, v^2 \times B$ (c) $F_m = q \, v^3 \times B$ (d) $F_m = q \, v^4 \times B$

22. A substance which behaves like a magnet in the presence of a strong magnetic field is called

(a) Magnets (b) Ferro magnets (c) Electromagnets (d) None of the above

23. In a circuit , if a resistance of the conductor is increased then current in the circuit will:

(a) Increase (b) Decrease (c) Remain the same (d) First increase and then decrease

24. The phenomenon that the resistance of a metal falls exactly to zero at a few degrees above absolute zero is called:

(a) Conductivity (b) Low conductivity (c) Super-conductivity (d) Low resistivity

25. Why should a resistance be introduced in a circuit in series deliberately?

(a) To increase current and decrease Voltage (b) To decrease current and voltage (c) To make current zero (d) To make voltage zero

26. In a house circuit, all electrical appliances are connected in parallel to each other between the line and neutral wires to get:

(a) Same current and different voltage (b) Same current and same potential difference

(c) Different current but same potential difference (d) Difference current and different potential difference

27. Power dissipated in a circuit in the form of 'V' and 'R' can be determine as:

(a) $P = \dfrac{V}{I}$ (b) $P = \dfrac{V^2}{R}$ (c) $P = \dfrac{R}{V^2}$ (d) $P = \dfrac{I}{V^2}$

28. Lyman series lies in

(a) Visible region (b) Ultra violet region (c) Infra red region (d) Far-infra red region

29. According to Bohr's theory of hydrogen atom, an electron can revolve around a proton indefinitely if its path is

(a) A spiral of increasing radius (b) A circle of constantly decreasing radius

(c) A circle of an allowed radius (d) An ellipse

30. According to Bohr's theory of hydrogen atom, the radii R_n of stationary electron is given by the equation

(a) $R_n = \dfrac{ke^2}{mv_n^3}$ (b) $R_n = \dfrac{ke^2}{mv_n^2}$ (c) $R_n = \dfrac{e^2}{mv_n^2}$ (d) $R_n = \dfrac{he^2}{mv_n^2}$

31. An interesting application of laser is the production of three dimensional images called

(a) Polygons (b) Holograms (c) Ovals (d) None of the above

32. The laser device used to fragment gallstones and kidney stones is called

(a) Laser beam (b) Laser scanner (c) Laser lithotropter (d) Ruby laser

33. Product of x-rays is a reverse phenomenon of

(a) Photoelectric Effect   (b) Compton Effect   (c) Pair Production   (d) Annihilation of matter

34. The nucleus of hydrogen with symbol $_1H^3$ is called
   (a) Proton   (b) Deuteeron   (c) Triton   (d) All of the above

35. Elements with atomic number Z > 82 are
   (a) Stable   (b) Unstable   (c) Small   (d) None of the above

36. Which of the following particles has very low penetration power?
   (a) α-particle   (b) β-particle   (c) γ-particle   (d) All of the above

37. Which of the following particles move with velocity of light?
   (a) α-particle   (b) β-particle   (c) γ-particle   (d) All of the above

38. A carbon nucleus emits a particle x and changes into nitrogen according to the equation
   $_6C^{14} + _7N^{14} \rightarrow x$ What is x?
   (a) An electron   (b) A proton   (c) An α-particle   (d) A neutron

39. During Pair-Production which particles are produced?
   (a) Proton & Electron   (b) Electron & Neutron   (c) Electron & Positron   (d) Proton & Neutron

40. The Solid-State Detector is basically
   (a) A forward biased PN-junction   (b) A reversed biased PN-junction
   (c) A forward biased transistor   (d) A Photocell

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PHYSICS:

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.**
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1. Einstein explained the photo-electric effect making the following assumption as a basis that,
   (a) The mass of the electrons increases   (b) Light consists the photons or quanta
   (c) The energy of light increases with speed   (d) The photo-electrons are identical with atomic electrons

2. An elevator initially accerlerates upward from rest and ascends with uniform speed. Time period of a simple pendulum in the elevator will,
   (a) Increase and then decrease   (b) Decrease and then increase   (c) Increase   (d) Decrease

3. A simple arrangement by means of which e.m.f,s. are compared is known
   (a) Voltmeter   (b) *Potentiometer*   (c) Ammeter   (d) None of the above

4. The physics underlying the operation of a refrigerator most closely resembles the physics underlying,

(a) The freezing of water   (b) The melting of ice   (c) The evaporation of water   (d) A heat engine

5. Let a certain body of mass 'm' placed on a horizontal surface move down the inclined plane then downward component of weight is
   (a) .mgCosθ   (b) .mgSinθ   (c) .mg Tanθ   (d) None

6. The plane faces of two identical plano convex lens, each having focal length 40 cm are pressed against each other to form a usual convex lens. The distance from this lens at which an object must be placed to obtain a real, inverted image with magnification one is.

   (a) 40 cm   (b) 80 cm   (c) 20 cm   (d) 60 cm

7. The law which gives definition of force is
   (a) Newton's law of gravitation   (b) Third law of motion
   (c) Second law of motion   (d) First law of motion

8. Hygrometer is an instrument used for measuring

   (a) The compression of water vapour with temperature   (b) The amount of water vapour in the atmosphere
   (c) Specific gravity of air   (d) The density of air

9. An inertial frame of reference is one whose:
   (a) Acceleration is zero   (b) Velocity is changing with time
   (c) Acceleration is uniform   (d) Inertia is not zero

10. A moving car whose engine is switched off. comes to rest after some time due to:

   (a) Inertia   (b) Its mass   (c) Friction   (d) Earth's gravitation

11.
   (a) When two bodies separate instantaneously after collision, the collision is said to be perfectly elastic.
   (b) When to bodies separate instantaneously after collision, the collision is said to be perfectly inelastic

12. According to the second law of motion, acceleration is proportional to:
   (a) Fores   (b) Time   (c) Mass   (d) Distance

14. When the object is placed at 2f of convex lens then the image formed behind the lens will be
   A) At the focus   B) At 2f   C) Beyond 2f   D) Between f and 2f

15. When the object is placed at principal focus of a convex lens then the image is formed at

   A) Same distance   B) Infinity   C) Same side of lens   D) Centre of curvature

16. Which one of the following cannot measure wavelength of X-rays in any way

   A)   Bragg's law   B)   Diffraction grating   C)   Compton effect   D)   Photo electric effect

17. Which one of the following properties is not found in both sound and light
   A)   Interference   B)   Diffraction   C)   Polarization   D)   Reflection

18.   The relation between time period T and angular velocity ω is given by
      (a) $T = 2\pi\omega$ (b) $T = \omega/2\pi$ (c) $T = 2\pi/\omega$ (d) $T = v\,\omega$

19.   When a body moves in a circle, the angle between its linear velocity v and angular velocity ω is
      (a) 0^0 (b) 45^0 (c) 90^0 (d) 180^0

20.   Π radians =
      (a) 90^0 (b) 180^0 (c) 60^0 (d) 30^0

21.   In racing car moving along a circular path the friction at the wheels and banking of roads provides the
      (a)   Centripetal Force   (b)   Centripetal Acceleration   (c)   Centre of Mass   (d)   Centrifugal Force

22.   The time period is defined as the time required to traverse ……… by a revolving body.
      (a)   One radian   (b)   180 degrees   (c)   One revolution   (d)   90 degrees

23.   Which of the following particles can induce artificial radio-activity in certain nuclei?
      (a)   α-particle   (b)   β-particle   (c)   γ-particle   (d)   All of the above

24.   Identify the alpha-particle?
      (a) $_1H^1$ (b) $_1H^2$ (c) $_1H^3$ (d) $_2He^4$

25.   Which of the following particles move with velocity of light?
      (a)   α-particle   (b)   β-particle   (c)   γ-particle   (d)   All of the above

26.   The torque on a body will be zero if the angle between $\vec{r}$ and F is zero or:
      a. 90^0 b. 180^0 c. 270^0 d.   None

27.   What is kinetic energy of a body of mass 10 kg moving with velocity $1m/s^2$?
      a.   10 Joules   b.   20 Joules   c.   5 Joules   d.   2.5 Joules

28.   Which of the following lists of physical quantities consists only of vectors:
      a.   Time, temperature, velocity   b.   Force, volume, momentum
      c.   Velocity, acceleration, mass   d.   Force, acceleration, velocity

29.   If two forces each of magnitude 5N act along the same line on a body, then the magnitude of their resultant will be
      a.   5N   b.   10N   c.   20N   d.   30N

30.   Applied force F on a body of mass m, moving with acceleration a is

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a. m/a   b. a/m   c. ma   d. m : a

COMPUTER:

Directions: *For each question below you are given four choices. SELECT ANY ONE THAT IS MOST APPROPRIATE ANSWER*
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1. A way of physically organizing data on a disk pack to minimize seek time uses
(a) sequential file
(b) removable hard
(c) the cylinder method
(d) Winchester technology

2. The speed with which a disk can find data being sought is called
(a) access time
(b) data transfer time
(c) direct time
(d) cylinder time

3. The disk storage that uses both a magnet and a laser beam
(a) hashing
(b) magneto-optical
(c) CD-ROM
(d) WORM

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Which is not a benefit of secondary storage?
(a) convenience
(b) DAT
(c) Economy
(d) Space

4. Before a sequential file can be updated the transactions must be first
(a) numbered
(b) labeled
(c) updated
(d) sorted

5. Time sharing of recourses by users is usually
(a) based on time slices
(b) based on input
(c) event-driven
(d) operated by spooling

6. Management of an operating system is handled by

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(a) by interpreter

(b) the supervisor program

(c) utility program

(d) the CPU

7. The process of allocating main memory to programs and keeping the programs in memory for execution as needed is called

(a) memory allocation

(b) memory management

(c) virtual storage

(d) real storage

8. The type of modulation that changes the height of the signal is called

(a) frequency

(b) phase

(c) amplitude

(d) prophase

9. The signals produced by a computer pr terminal to be sent over phone lines must be converted to

(a) Modems

(b) Analog signals

(c) Digital signals

(d) Microwaves

10. Each computer in a LAN is called

(a) bus

(b) node

(c) host

(d) server

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11. A display lighter and slimmer than a CRT is

(a) COM

(b) Flat panel

(c) Graphics card

(d) Terminal

12. Computer animation is a form of

(a) LCD

(b) Video graphics

(c) CAD/CAM

(d) Color printer output

13. A color screen with the best resolution has the most

(a) CRT

(b) VGA

(c) COM

(d) Pixel

14. The name for the screen's clarity :

(a) resolution

(b) pixel

(c) discrete

(d) LCD

ENGLISH:

Directions: *For each question below you are given 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. Miss Watson termed Hock's behavior _____ because in her opinion noting could excuse his deliberate disregard of her commands.
    - A. devious
    - B. intolerant
    - C. Irrevocable
    - D. indefensible
    - E. Boisterous

2. Either the surfing at Maui is_____, or I went there on an off day.
    - A. Consistent
    - B. Thrilling
    - C. Invigorating
    - D. Overrated
    - E. Scenic

3. Your _____ remarks spoil the effect of your speech; try not to stray from your subject.
    - A. innocuous
    - B. Digressive
    - C. Derogatory
    - D. Persistent
    - E. Enigmatic

ANALOGIES
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. TELLER : BANK ::
    - (a) Artist : museum
    - (b) Cashier : check
    - (c) Waiter : restaurant
    - (d) Borrower : loan
    - (e) Mourner : funeral

5. INNING : BASEBALL ::
    - (a) round : boxing
    - (b) puck : hockey
    - (c) touchdown : football
    - (d) serve : tennis
    - (e) outing : hiking

6. DEGREE : TEMPERATURE ::
    - (a) ounce : weight

(b) fathom : volume

(c) mass : energy

(d) time : length

(e) light : heat

(a) peg : ukelele

(b) string : banjo

(c) pipe : organ

(d) bow : violin

(e) head : tambourine

7. PICK : GUITAR ::

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 <u>opposite</u> in meaning to the capitalized word.

8. NERVOUS:

(A) Courageous (B) Puzzle (C) Bold (D) Trainee

9. NOTORIOUS:

(A) Renowned (B) Invincible (C) Inactive (D) Fashionable

10. NOCTURNAL:

(A) Patrolling (B) Daily (C) Harsh (D) Marauding

11. OBDURATE:

(A) Fleeting (B) Finite (C) Yielding (D) Permanent

READING COMPREHENSION

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

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Passage:

To be happy and really safe, one ought to have at least two or three hobbies and they must all be real. It is no use starting late in life to say "I will take an interest in this or that". A man may acquire great knowledge of topics unconnected with his daily work and yet hardly get any benefit or relief.

QUESTIONS

12. The writer argues that for real happiness

A) More than one hobbies are preferable

B) Two or three hobbies are essential

C) Hobbies are quite important

D) Hobbies should be interesting

13. The phrase 'ought to' in the first sentence suggests

A) Liking

B) Likelihood

C) Compulsion

D) Preference

14. The words 'this or that' in the second sentence refer to

A) Hobbies

B) Topics

C) Daily work

D) None of the above

15. Select the choice closest in meaning to the word 'hardly' in the last sentence

A) Rarely

B) Never

C)   Infrequently

D)   Scarcely

END OF TEST

For Answer Key:

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