Tribhuvan University

Institute of Science and Technology

4 Years Bachelor in Computer Science and Information Technology

Entrance Examination

2069

Mathematics ($1 \times 25 = 25$**)**

1. If $f(x) = \sqrt{4 - x^2}$then $f(2)$ is
   a) 0 b) 4 c) 2 d) -2
2. If $|x| = 2$ then the solution set is
   a) {2,2} b) {-2,2} c) (-2,2) d) [-2,2]
3. If A, B and C are non-empty sets and A C B then A ∩ B is
   a) B b) A c) $\emptyset$ d) C
4. The smallest prime number is
   a) 1 b) 0 c) 2 d) -1
5. The curve $y^2 = 4x$ is symmetrical about
   a) Y axis b) X axis c) both axes d) origin
6. The value of x for $\sum_{i=1}^{2}(xi - 4) = 13$ is
   a) 8 b) 7 c) 13 d) -7
7. The matrix $A = \begin{pmatrix} 1 & -3 \\ 3 & 2 \end{pmatrix}$ is
   a) Symmetrical b) skew symmetric
   c) Diagonal d) unit
8. The value of $\begin{vmatrix} 0 & 1 & 2 \\ 0 & 1 & 2 \\ 1 & 2 & 3 \end{vmatrix}$ is
   a) 0 b) 1 c) -1 d) 2
9. The value of $(1 - \omega)(1 - \omega^2)$, ω is cube root of unity of a complex number is
   a) 0 b) 1 c) 2 d) 3
10. The magnitude of 2-3i is
    a) $\sqrt{13}$ b) $\sqrt{5}$ c) 1 d) 13

11. 1 and 2 are the roots of
    a) $x^2 - 3x + 2 = 0$ b) $x^2 + 3x + 2 = 0$
    c) $x^2 + x + 2 = 0$ d) $x^2 + 3x + 1 = 0$
12. The value of $tan(tan^{-1}1)$ is
    a) 0 b) 1 c) -1 d) $\sqrt{3}$
13. The solution of $cosx = \frac{1}{2}$ is
    a) 2nπ b) $\pi/3$ c) 2n$\pi \pm \pi/3$ d) 2n$\pi + \pi/3$
14. The length of the perpendicular from (0,0) to the line $x + y + 1 = 0$ is
    a) $\frac{1}{\sqrt{2}}$ b) $\sqrt{2}$ c) $\frac{-1}{\sqrt{2}}$ d) $-\sqrt{2}$
15. The angle between the lines $2x^2+xy-2y^2=0$ is
    a) 0° b) 45° c) 135° d) 90°
16. Center of the circle $x^2 + y^2 - 2x - 4y + 1 = 0$ is
    a) (1,2) b) (0,0) c) (2,1) d)(2,2)
17. Equation of tangent to the circle $x^2 + y^2 = 10$ at (2,3) is
    a) x + y=10 b) x + 2y =10

c) 2x + 3y = 10 d) 2x + y = 10

18. $\lim_{x-0} \frac{x^3-2^3}{x-2}$ is

a) 12 b) 6 c) 9 d) 0/0

19. $\lim_{x-0} \frac{tanx-5x}{x}$ is equal to

a) 6 b) 5 c) 0 d) 0/0

20. The function f(x)={x+2(x>=2) and 2x(x<2)} is continuous at

a) x = 0 b) x = 2 c)x = -2 d) x = 1

21. If the derivative of $x^2 + 3x$ is 1, the value of x is

a) 0 b) -1 c) 2 d) 5

22. If x = 2t + 1 and $y = t^2$, then dy/dt is

a) t b) 1/t c) t^2 d) 0

23. The points of inflection for the curve $x^3 + 4x$ is

a) 0 b) 1 c) 6 d) -1

24. $2\int_0^1 xdx$ is equal to

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

25. $\int cosxdx$ is equal to

a) sin 2x b) – cos x/2 c) sin 2x/2 d) 2 sin 2x

English($1 \times 25 = 25$**)**

26.……his project was not completed, he was given permission to leave.

a) Although b) in spite of c) as it d) despite

27. Rajendra is …….. hard working and friendly.

a) But also b) both c) as well as d)not only

28. More than one hundred people …….. to the meeting.

a) Have come b) has come c) is coming d) was coming

29. Mr. Thakur speaks both Nepali……Maithili very perfectly.

a) As well as b) and also c) and d) with

30. Reading, observing, teaching and……. are good ways to gain knowledge.

a) Discussion b) discussing c) to discuss d) discussing

31. The river Narayani flow through Narayanghat.

a) An b) a c) the d) no article

32. In recent years people have been more concerned…….quality of drinking water.

a) With b) for c) about d) of

33. She was killed …… a robber …….. a gun.

a) By; for b) by; with c) in; for d) with; for

34. The fear of rape and robbing…….caused many people run away from the cities.

a) Has b) have c) wasd) has been

35. The grass needs……..

a) Cutting b) to cut c) to be cut d) both a and b

36.…… this evidence, I know, he is in the right.

a) At b) by c) from d) in

37. I object……..your proposal.

a) At b) about c) in d) to

38. I have worked…….the answer.

a) About b) over c) among d) out

39. Which word doesn't take……is suffix?
    a) History b) athlete c) artist d) success
40. Which of the following is a verb?
    a) Spectacular b) marvel c) comparable c) fancy
41. Which of the following does not take a prefix?
    a) Provided b) poisonous c) protected d) detected
42. We shall finish the work before he…….
    a) Will come b) would come c) could come d) comes

43. The memoranda……..approved.
    a) Is b) was c) has been d) have been
44. Which is incorrect?
    a) Scissors b) tweezers c) forceps d) pincers
45. Lack of blood is……..
    a) Amnesia b) insomnia c) anemia d) epicurean
46. A well experienced person is……
    a) Lawyer b) cosmopolitan c) veteran d) teacher
47. The doubt……..Gita will come.
    a) That b) if c) when d) why
48. They walk very fast. The underlined work is…….
    a) Adverb b) adjective
    c) preposition d) demonstrative adjective
49. The passive of: They heard me sing a song.
    a) I was heard to sing a song.
    b) I was heard sing a song.
    c) I was heard singing a song.
    d) I was heard to sing a song by them.
50. The indirect of: He said, 'Congratulation'.
    a) He said that congratulations.
    b) He congratulated me.
    c) He congratulated that I passed.
    d) He said that I deserved congratulations.

Physics ($1 \times 25 = 25$

51. The duration in which the displacement becomes half the amplitude in the case of a simple harmonic motion if its period is 12 second, is
    a) 6 sec b) 3 sec c) 2 sec d) 1 sec
52. A train of length 600 m is traveling with a velocity of 64 Km/hr. The time taken by the train to cross clearly a bridge of 1 km will be
    a) 1.5 sec b) 1.5 min c) 15 sec d) 15 min
53. Which one of the following pairs of physical quantities has the same dimension?
    a) Work and power
    b) energy and power
    c) Work and energy
    d) angular momentum and linear momentum

54. A body of mass 1 Kg is rotated in a horizontal circle of radius 50 cm. If F and v represent the centripetal force and the constant speed respectively, which one of the following expressions may be correct?

a) $v=\sqrt{F}$ b) $v=\sqrt{2F}$ c) $v=\frac{1}{2}\sqrt{F}$ d) $V=\sqrt{\frac{F}{2}}$

55. The root mean square (rms) speed of hydrogen molecular at STP is 2 km per second. The rms speed of oxygen molecule at 810° C is

a) 2 km s^{-1} b) 1 km s^{-1} c) 0.5 km s^{-1} d) 4 km s^{-1}

56. Bolometer measures the

a) Coefficient of thermal conductivity b) thermo emf
c) Specific heat d) heat radiation

57. A temperature of 14°F is equivalent to

a) 296 K b) 263 K c) 250 K d) 1.5°C

58. A myopic eye cannot see object beyond 1.5 m. What power of lens will be required to correct this defect of vision?

a) 1.5 D b) 0.66 D c) -1.5 D d) -0.66 D

59. The critical angel of glass-water interface is

a) $\sin^{-1}(8/9)$ b) $\sin^{-1}(4/5)$ c) $\sin^{-1}(3/4)$ d) $\sin^{-1}(2/3)$

60. A diffraction grating has 5000 lines per cm. The maximum order visible with the radiation of wavelength 600 nm in diffraction experiment

a) 2 b) 3 c) 4 d) 0

61. Light travels through a glass plate of thickness t and refractive index n. If C is the velocity of light in vacuum, the time taken by light to travel this thickness is

a) t/nc b) cnt c) nt/c d)tc/n

62. Two charges of 2 μC and 4 μC are 1m apart. The electric field intensity is zero at a point between the charges. This point is approximately at a distance.

a) 50 cm from 2 μC charge b) 59 cm from 2 μC charge
c) 41 cm from 2 μC charge c) 66 cm from 2 μC charge

63. An open organ pipe can produce

a) Only odd harmonics
b) only even harmonics
c) Both odd and even harmonics
d) depends upon the length of pipe

64. Watt per ampere is the unit of

a) Electric potential b) electric field intensity
c) Electric power d) electric energy

65. Two wires A and B of equal radii are drawn from the same material. Their lengths are 1m and 2m respectively. The resistivity of A is

a) Less than that of B
b) Equal to that of B
c) More than that of B
d) Depends upon the amount of current flowing in wires

66. When a capacitor is added in series in an LCR circuit, the impedance of the circuit

a) Increase
b) decrease

c) remains unchanged
d) Increases or decreases depending upon the frequency of a.c.

67. A cell of emf X if connected across a resist of R. The potential difference across the wire is measured as Y. The internal resistance of the cell should be
a) X-(Y/R) b) (X-Y)R c) (X-Y)R/X d) (X-Y)R/Y

68. The ratio of wavelength of the first line of Lyman series to the first line of Balmer series is
a) 5:27 b) 20:27 c) 27:20 d) 1:4

69. If work function of a metal is 3.3 eV, the threshold frequency in photoelectric effect will be
a) 2×10^{15} Hz b) 8×10^{14} Hz c) 4×10^{16} Hz d) 6×10^{17} Hz

70. A radioactive material of half life 5 days has its initial mass of 1 Kg. the amount decayed after20 days will be
a) 125 g b) 250 g c) 550 g d) 875 g

71. A charged particle is undergoing a circular motion in a uniform magnetic field. The time period is independent of
a) speed b) mass c) charge d) magnetic induction

72. Velocity of sound in a gas is 330 ms^{-1} at STP. Its value at 300K will nearly be
a) 250 ms^{-1} b) 300 ms^{-1} c) 360 ms^{-1} d) 450 ms^{-1}

73. Time of flight T of a projectile is related to the horizontal range R by an equation $gT^2=2R$. the angle of projection (in degrees) is
a) 90° b) 60° c) 45° d) 30°

74. An electron in a field of 1 NC^{-1} will have an approximate acceleration
a) 1.7×10^{11} ms^{-2} b) 1×10^{6} ms^{-2}
c) 1×10^{12} ms^{-2} d) 1×10^{7} ms^{-2}

75. A bullet gets heated if stopped by a target. If its velocity is doubled the rise in temperature of the bullet will be
a) Same b) 2 times c) 4 times d) 16 times

Chemistry ($1 \times 25 = 25$**)**

76. Paraffin's are also called
a) alkanes b) alkenes c) alkynes d) ethylenes

77. A green color is formed in Lassaigne's test if nitrogen is present in an organic compound. This green color is due to the formation of
a) $Fe_4[Fe(CN)_6]_3$ b) $Fe(CNS)_3$
c) $Na_4[Fe(CN)_5NOS]$ c) $Na[Fe(CN)_6$

78. Al_4C_3 reacts with water to give
a) C_2H_4 b) C_2H_2 c) H_2 d) CH_4

79. Aniline on warming with Benz aldehyde forms
a) Acetanilide b) benzalinide
c) Schiff's base d) phenol

80. Which of the following compounds is used as the best anti-knocking agent?
a) Tetraethyl lead b) methane
c) methoxy propane c) methyl cyanide

81. Chloroform reacts with concentrated HNO_3 on heating and yields
a) Chloretone b) chloropicrin
c) Carbon tetrachloride c) carbonyl chloride

82. Which of the following reagents is used to detect the aldehyde group?
    a) Ninhydrin reagent b) Tollen's reagent
    c) Grignard reagent d) Baeyer's reagent
83. Terylene is a
    a) Addition polymer b) condensation polymer
    c) Polyamide d) polyimide
84. The formula of Zinc blende is
    a) $ZnCO_3$ b) ZnS c) ZnO d) $ZnO.Fe_2O_3$
85. The oxidation state of iron in Mohr's salt is
    a) +2 b) +3 c) +1 d) 0

86. Which of the following oxides is acidic?
    a) FeO b) CO_2 c) CO d) CaO
87. The structure of ammonia molecule is
    a) V-shaped b) tetrahedral c) linear d) trigonal pyramidal
88. Orthophosphoric acid is
    a) Monobasic acid b) dibasic acid
    c) Tribasic acid d) tetrabasic acid
89. The formula of Epsom salt is
    a) $MgSO_4.7H_2O$ b) MgO c) $CaSO_4.2H_2O$ d) CaO
90. Ostwald's process is used for the manufacture of
    a) Sulphuric acid b) nitric acid
    c) ammonia d) white phosphorus
91. Among the following elements, the one having highest electron affinity is
    a) Chlorine b) fluorine c) iodine d) bromine
92. 44 gm of CO_2 is equal to
    a) 6.023×10^{23} no of CO_2 molecule
    b) 6.023×10^{21} no of CO_2 molecule
    c) 6.023×10^{19} no of CO_2 molecule
    d) 6.023×10^{18} no of CO_2 molecule
93. Equivalent weight of potassium dichromate in acidic medium is equal to
    a) Mol. wt/1 b) Mol. wt/6
    c) Mol. wt/3 d) Mol. wt/5
94. The weight of sodium carbonate required to prepare 100 mL of N/10 sodium carbonate solution is
    a) 0.53 gm b) 5.3 gm c) 0.053 gm d) 5.6 gm
95. Which of the following is the unit of surface tension?
    a) Dynes.cm b) $dynes.cm^{-1}$
    c) $dynes.cm^2$ d) $dynes.cm^{-2}$

96. Electrons will distribute themselves in degenerate orbitals so as to retain parallel spin as much as possible. This is called

a) Hund's rule b) Aufbau principle

c) Uncertainty principle d) Pauli's exclusion principle

97. The actual electronic configuration of copper is

a) $[Ar]4s^2 3d^8$ b) $[Ar]4s^2 3d^{10}$

c) $[Ar]4s^2 3d^{10}$ d) $[Ar]4s^2 3d^8$

98. If the pH of a solution is 5.2, the hydrogen ion concentration of the solution is

a) 6.3×10^{-5} M b) 6.3×10^{-6} M

c) 6.3×10^{-7} M d) 6.3×10^{-4} M

99. The unit of rate constant for first order reaction is

a) Sec^{-1} b) mol sec^{-1} c) mol^{-1} sec^{-1} d) $liter^2 mol^{-2} s^{-1}$

100. The enthalpy of formation of the compound is

a) Always positive

b) Always negative

c) Can be positive or negative

d) Unpredictable