

**Tribhuvan University**  
**Institute of Science and Technology**  
**4 Years Bachelor in Computer science and Information Technology (BSC. CSIT)**

Attempt all questions:

Entrance Exam 2078

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

1. Let  $U$  be the universal set,  $A$  and  $B$  be two sets.  
If  $n(U) = 100$ ,  $n(A) = 35$ ,  $n(B) = 60$  and  $n(A \cup B) = 80$ , then what is the value of  $n(A \cap B)$ ?  
(a) 20 (b) 15 (c) 45 (d) 85
2. If  $A = [-3, 1]$  and  $B = [-2, 4]$ , then the value of  $A - B$  is  
(a)  $[-3, -2)$  (b)  $[1, 4]$  (c)  $(-3, -2)$  (d)  $[-3, 2)$
3. A sentence which is a true statement is:  
(a) Why are you weeping? (b)  $2x + 3 = 5$   
(c) Mount Everest is in Nepal (d) Please help me to solve this problem
4. Let a function  $f: N \rightarrow N$  be defined by  $f(x) = 2x$  for all  $x \in N$ . Then  $f$  is  
(a) many to one (b) onto (c) one to one (d) one to one and onto
5. The function  $f(x) = 12 - 3x$  on  $R$  is  
(a) increasing (b) decreasing  
(c) constant (d) Increasing and decreasing
6. If  $\cos x = -1$ , then the value of  $x$  is  
(a)  $2n\pi$  (b)  $(2n + 1)\frac{\pi}{2}$  (c)  $(n + 1)\pi$  (d)  $(2n + 1)\pi$
7. If  $a, b, c$  be in A.P.,  $b, c, d$  in G.P.,  $c, d, e$  in H.P., then  $a, c, e$  are in  
(a) G.P. (b) H.P. (c) A.P. (d) none
8. If  $A = [-7]$ , then the value of  $\Delta A$  is  
(a) 7 (b)  $- + 7$  (c)  $- + 7$  (d) -7
9. The system of equations  $3x - 2y = 1$ , and  $6x - 4y = 2$  is  
(a) inconsistent and dependent (b) consistent and dependent  
(c) consistent and independent (d) inconsistent and independent
10. The sum of the three cube roots of one is  
(a) 0 (b) 1 (c)  $w^2$  (d)  $w$
11. The value of  $\lim_{x \rightarrow 0} \frac{\sin x}{x}$   
(a) 1 (b)  $\pi$  (c)  $\frac{\pi}{180}$  (d)  $\frac{\pi x}{180}$
12. The derivative  $e^{\sqrt{x}}$   
(a)  $e^{\sqrt{x}}$  (b)  $2\sqrt{x} e^{\sqrt{x}}$  (c)  $\frac{e^{\sqrt{x}}}{2\sqrt{x}}$  (d)  $e^{\sqrt{x}} - 1$
13. The value of  $\int \frac{x}{1+x} dx$  is  
(a)  $\ln |1+x|$  (b)  $x + \ln |1+x|$  (c)  $x - \ln |1+x|$  (d)  $\frac{x}{1+x}$
14. The value of  $\int_0^2 3(1+x)^2 dx$  is equal to  
(a) 2 (b) 14 (c)  $14/3$  (d)  $2/3$

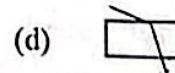
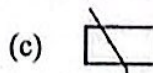
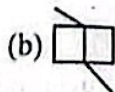
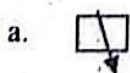
15. Let A and B be two sets, then  $A \cup B$  complement is  
 (a)  $A \cup B$  (b)  $A$  complement  $\cap$   $B$  complement  
 (c)  $A$  complement  $\cup$   $B$  complement (d)  $A \cap B$
16. For any real number  $x$  with  $|x| < 1$ , the value of  $\sin^{-1} x$  is equal to  
 (a)  $\sin^{-1} \sqrt{1-x^2}$  (b)  $\cos^{-1} \sqrt{1-x^2}$  (c)  $\tan^{-1} \sqrt{1-x^2}$  (d)  $\cos^{-1} \sqrt{1-x}$
17. The inverse of the matrix is  $\begin{pmatrix} 2 & 3 \\ 3 & 5 \end{pmatrix}$  is  
 (a)  $\begin{pmatrix} 2 & -3 \\ -3 & 5 \end{pmatrix}$  (b)  $\begin{pmatrix} 5 & -3 \\ 3 & 2 \end{pmatrix}$  (c)  $\begin{pmatrix} 5 & -3 \\ 2 & -3 \end{pmatrix}$  (d)  $\begin{pmatrix} 5 & -3 \\ -3 & 2 \end{pmatrix}$
18. The remainder of  $x^3 - 2x^2 + 5x + 10$  when divided by  $x + 1$  is  
 (a) 14 (b) 2 (c) -18 (d) 18
19. The acute angle between the lines  $x - 3y - 6 = 0$  and  $2x - y + 5 = 0$   
 (a)  $\frac{\pi}{2}$  (b)  $\frac{\pi}{3}$  (c)  $\frac{\pi}{4}$  (d)  $\frac{2\pi}{3}$
20. The coefficient of  $x^2$  in  $(x^2 + \frac{a^2}{x^2})$  is  
 (a)  $3a$  (b)  $3x^2 a^2$  (c) 3 (d)  $3a^2$
21. How many number of three different digits less than 500 can be formed from the integers 1, 2, 3, 4, 5?  
 (a) 48 (b) 180 (c) 80 (d) 20
22. The coordinates of focus of the parabola  $y^2 = 8x$  is  
 (a) (2,0) (b) (2,4) (c) (4,0) (d) (0, 2)
23. The relation between direction cosines of a line is given by  
 (a)  $a^2 + b^2 + c^2 = 1$  (b)  $a^2 + b^2 + c^2 = 0$  (c)  $l^2 + m^2 + n^2 = 1$  (d)  $l^2 + m^2 + n^2 = 0$
24. The unit vector in the direction of  $i + j - 2k$  is  
 (c)  $\frac{1}{\sqrt{6}}$  (b)  $\frac{1}{6}$  (c)  $\frac{i + j - 2k}{6}$  (d)  $\frac{i + j - 2k}{\sqrt{6}}$
25. The center of the circle  $x^2 + y^2 - 2ax - 2ay + a^2 = 0$  is  
 (a) (a,0) (b) (a, a) (c) (0, a) (d) (-a, -a)
- English (25x1 = 25)**
26. The word "Glissando" gets main stress on  
 (a) 1st syllabus (b) 2nd syllabus (c) 3rd syllabus (d) None
27. Which of the following words does get its prime stress on the second syllable?  
 (a) Investigate (b) Introverted (c) Intimate (d) Intricate
28. Pick out the word or group of words which has nearly the same meaning as the word "Magnitude"?  
 (a) Attraction (b) Assessment (c) Gravity (d) Weight
29. Give an appropriate synonym to the word "Outpaced"  
 (a) occupied (b) nullified (c) ruled out (d) surpassed
30. Give an appropriate antonym to the word "Impulsive"  
 (a) Cautious (b) innocent (c) insipid (d) interesting
31. Give a suitable opposite word to the word "Reputation"  
 (a) restrain (b) reluctant (c) notoriety (d) prudence



32. One who abandons religious faith is  
(a) insolvent (b) apostate (c) veteran (d) fatal
33. An office which has no work and responsibility but high salary  
(a) sinecure (b) conjurer (c) expert (d) indelible
34. In the incident of fire, we should warn the house owner ..... Danger but to a student a teacher should warn .... errors.  
(a) for, to (b) of, against (c) to, against (d) about, for
35. I am sympathetic..... those students who are noits not satisfied..... their marks.  
(a) on, for (b) to, with (c) with, with (d) to, fro
36. .... I had that book with me I did not give it to him.  
(a) However (b) unless. (c) Although (d) But
37. Pick up the correct feminine gender of the word "Gander"  
(a) Ganderess (b) Gantry (c) Gandma (d) Goose
38. Give the exact meaning of the idiom "Go through the roof"  
(a) price rise or increase quickly (b) walking on the roof from corner to corner  
(c) cross the roof of a house quickly (d) take no time to walk on the roof
39. Pick up the exact meaning of the word "Hellenism"  
(a) Belief that God is unknowable  
(b) Conformity to or imitation of ancient Greek thought, customs or styles  
(c) Belief that there is no God  
(d) Strong adherence to one's community
40. Pick up correct phrasal verbs for the expression "When he was passing through the door the dogs suddenly..... him  
(a) set out (b) set to (c) set on (d) set off
41. Pick up correct phrasal verbs for the expression "would you like to help me..... the writing desk?"  
(a) clear up (b) clear out (c) clear off (d) clear on
42. Give exact meaning of the idiom "a stick in the mud"  
(a) A person with liberal ideas  
(b) A person desiring for improvement  
(c) A person with high ideals and values  
(d) A person with fixed views and ideas and not ready for change
43. We must be early..... we won't get seats  
(a) otherwise (b) however (c) then (d) therefore
44. Some people waste food ..... Others haven't enough.  
(a) when (b) while (c) but (d) if
45. If you interfere with ..... Nature you will suffer for it.  
(a) the (b) a (c) an (d) none
46. Some one had recognized him,.....?  
(a) hadn't they? (b) didn't they? (c) did they? (d) had they?
47. The photographs in the papers bore no ..... at all to the original  
(a) nearness (b) resemblance (c) comparison (d) identify



48. Although they are not rich, they always wear ..... clothes.  
 (a) respectful (b) respective (c) respectable (d) respected
49. This is ..... chosen for the school complex to be build next year.  
 (a) site (b) area (c) locality (d) sight
50. Work for which no regular salary is paid  
 (a) honorable (b) honorary (c) temporary (d) ad hoc
- Physics (25x1 = 25)**
51. The velocity of a body is given by the equation  $v = \frac{b}{t} + ct^2 + dt^3$ . The dimensional formula of c is  
 (a)  $[M^0L^3T^3]$  (b)  $[ML^0T^{-3}]$  (c)  $[M^0L^0T]$  (d)  $[M^0L^3T^{-3}]$
52. If magnitudes of two vectors be 3 and 4 and value of their scalar product is 6, the angle between them is  
 (a) 30 Degree (b) 45 degree (c) 60 degree (d) 90 degree
53. Star appears to move from east to west because  
 (a) all stars move from east to west (b) the earth rotates from west to east.  
 (c) the earth rotates from east to west (d) the background of the stars moves from west to
54. To avoid the slipping while walking on ice one should take smaller steps because of the east.  
 (a) larger friction (b) smaller friction  
 (c) larger normal reaction (d) smaller normalreaction
55. A scooter of mass 120kg is moving with a uniform velocity of 108km/hr. the force required to stop the velocity in 10 sec is  
 (a) 360N (b) 720N (c) 180N (d) 90N
56. In young's double slit experiment the distance of tenth bright fringe from the center of interference pattern on either side is 3.44 cm the slit separation if the screen is at 2m from wave length 589 nm is  
 (a) 0.24mm (b) 0.44mm (c) 0.34mm (d) 0.64mm
57. Up thrust depends upon  
 (a) shape of the body (b) depth from liquid surface  
 (c) volume of liquid displaced (d) mass of the body
58. Two copper rods of equal lengths and unequal diameters are heated through the same range of temperature. Its increase in length will be  
 (a) more in thin rod (b) more in thick rod (c) same in both rods (d) uncertain
59. The mean free path of a gas varies with pressure (P) as  
 (a) P (b)  $P^{-1}$  (c)  $P^2$  (d)  $P^{-2}$
60. The boiling of water inside the pressure cooker in degree Celsius is  
 (a) 0 degree Celsius (b) 100 degree (c) 120 degree (d) -120 degree
61. The path of a ray of light coming from air passing through a rectangular slab traced by four students are shown as A, B, C and D in figure. Which of them is correct?





62. The image of a distant object formed by a far sighted person is  
 (a) at the retina (b) behind the retina  
 (c) in front of retina (d) no image is formed
63. The charge in uniform motion produces  
 (a) an electric field only (b) magnetic field only  
 (c) both electric & magnetic (d) neither electric nor magnetic
64. In order to increase the capacity of parallel plate capacitor one should introduce between the plates a sheet of  
 (a) tin (b) copper (c) steel (d) mica
65. The self inductance of a coil is 5 mH. If a current of 2A is flown, what will be the magnetic flux through the coil.  
 (a) 1 Weber (b) 0.100 Weber (c) 1.010 Weber (d) 0.001 Weber
66. A 100W/220V bulb is used in a line of 440V. Its power will be  
 (a) 50W (b) 100W (c) 200W (d) 400W
67. The electric field intensity at the surface of charged conductor is  
 (a) Zero (b) directed tangentially to the surface  
 (c) directed normally to the surface (d) infinite
68. In a non-resonant circuit, what will be the nature of the circuit for frequencies higher than the resonant frequency?  
 (a) resistive (b) capacitive (c) inductive (d) passive
69. The material used for permanent magnet has  
 (a) high resistivity, high coercivity (b) low retentivity, low coercivity  
 (c) low retentivity, high coercivity (d) high retentivity, high coercivity
70. The angle of dip is the angle of  
 (a) between the vertical component of earth's magnetic field and magnetic meridian.  
 (b) between the vertical component of earth's magnetic field and geographic meridian.  
 (c) between earth's magnetic field direction and horizontal direction  
 (d) between the magnetic meridian and geographic meridian
71. If an electron has initial velocity in a direction perpendicular to the direction of electric field, the path of an electron is  
 (a) straight line (b) parabola (c) circle (d) ellipse
72. The plank's constant can be experimentally determined by  
 (a) spectroscopic experiment (b) tangent galvanometer experiment  
 (c) compound pendulum experiment (d) photo-electric experiment
73. When electrons are accelerated by 50 kV and 0.4% of energy of cathode is converted into X-Rays and heat is evolved at 600W. the current is  
 (a) 0.12 A (b) 0.012A (c) 0.024A (d) 2.4A
74. The difference between  $^{92}\text{U}^{235}$  &  $^{92}\text{U}^{238}$  atom is  
 (a)  $^{92}\text{U}^{238}$  contain 3 more protons  
 (b)  $^{92}\text{U}^{235}$  contains 3 more protons  
 (c)  $^{92}\text{U}^{238}$  contains 3 more neutrons  
 (d)  $^{92}\text{U}^{238}$  contains 3 more neutrons & 3 more electrons



75. In the depletion layer of an unbiased p-n junction diode, there are  
(a) only electrons (b) only holes  
(c) both electrons and holes (d) only fixed ions.
76. The number of molecules  
(a)  $3.2 \times 10^{23}$  (b)  $6.02 \times 10^{23}$  (c)  $3.2 \times 10^6$  (d)  $6.02 \times 10^{10}$
77. In a given atom no two electrons can have the same values for all the four quantum numbers. This is called  
(a) Pauli's exclusion principle (b) Hund's rule  
(c) Aufbau principle (d) Uncertainty principle
78. The shape of SF molecule based on VSEPR theory is  
(a) linear (b) square planar (c) octahedral (d) trigonal bipyramidal
79. Which is not the isotope of hydrogen?  
(a) protium (b) deuterium (c) tritium (d) fullerene
80. The composition of brown ring in nitrate test is  
(a)  $\text{FeSO}_4 \cdot \text{NO}$  (b)  $\text{FeSO}_4 \cdot \text{NO}_2$  (c)  $\text{FeSO}_4 \cdot \text{NO}_3$  (d)  $\text{FeSO}_4 \cdot \text{N}_2\text{O}$
81. The formula of hypo is  
(a)  $\text{H}_2\text{S}_2\text{O}_3$  (b)  $\text{Na}_2\text{S}_2\text{O}_3 \cdot 5\text{H}_2\text{O}$  (c)  $\text{Na}_2\text{S}_4\text{O}_6$  (d)  $\text{Na}_2\text{SO}_3$
82.  $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$  is known as  
(a) bleaching powder (b) quick lime (c) Epsom salt (d) plaster of paris
83. Minamata disease was caused by consumption of fish containing.  
(a) zinc (b) cadmium (c) arsenic (d) mercury
84. Which element can not be detected by Lassaigne's test?  
(a) fluorine (b) sulphur (c) chlorine (d) nitrogen
85. Which of the following reagents can distinguish alkyne from alkane?  
(a) Fehling's solution (b) ammoniacal silver nitrate  
(c) Bayer's reagent (d) Lucas reagent
86. The catalyst used in Friedel Craft's alkylation reaction is  
(a) finely divided nickel (b) Cuprous Halide  
(c) anhydrous  $\text{AlCl}_3$  (d) Conc.  $\text{H}_2\text{SO}_4$
87. Urea is a  
(a) nitrogenous fertilizer (b) phosphatic fertilizer  
(c) potash fertilizer (d) none
88. IUPAC name of acetone is  
(a) 2-butanone (b) 3-pentanone (c) propanone (d) ethanal
89. Equivalent weight of sulphuric acid is equal to its  
(a) mol. Wt/5 (b) mol. Wt/4 (c) mol. Wt/3 (d) mol. Wt/2
90. The rate of reaction is independent of  
(a) molecularity (b) temperature  
(c) particle size of reactant (d) concentration of reactants

91. Which law of thermodynamics is illustrated by the statement "The total amount of energy in the universe remains constant"?
- (a) second law      (b) first law      (c) third law      (d) none
92. An example of organophosphate insecticides is
- (a) DDT      (b) BHC      (c) malathion      (d) dieldrin
93. Which of the following is not true for aniline?
- (a) gives coupling reaction      (b) reacts with aldehyde  
(c) typical aromatic amine      (d) does not give coupling reactions.
94. Ethyl alcohol is 100 percent purity is called
- (a) absolute alcohol      (b) rectified spirit      (c) denatured alcohol      (d) all of above
95. Haloalkanes when heated with sodium metal in presence of ether as solvent give alkanes. This reaction is known as
- (a) Reimer-Tiemann reaction      (b) Wurtz reaction  
(c) Carbylamine reaction      (d) Kolbe's reaction
96. Which is not true for ketones
- (a) do not reduce Tollen's reagent      (b) do not reduce Fehling solution  
(c) reduce Tollen's reagent      (d) do not reduce Benedict solution.
97.  $\text{CO}_2$  is a
- (a) Lewis base      (b) Brønsted acid  
(c) Brønsted base      (d) Lewis acid
98. Metal used for galvanizing iron sheet is
- (a) zinc      (b) copper      (c) cadmium      (d) cobalt
99. Which of the following compound is called Lunar caustic?
- (a)  $\text{Ag}_2\text{S}$       (b)  $\text{Ag}_2\text{O}$       (c)  $\text{AgCl}$       (d)  $\text{Ag}_2\text{O}$
100. Which of the following is the strongest acid?
- (a)  $\text{CH}_3\text{COOH}$       (b)  $\text{ClCH}_2\text{COOH}$       (c)  $\text{Cl}_3\text{CCOOH}$       (d)  $\text{Cl}_2\text{CHO}$