

TUIOST Old Question For B.Sc. CSIT Entrance Preparation

Tribhuvan University
Institute of Science and Technology
4 Years Bachelor in Computer Science and
Information Technology (BSc. CSIT)
Entrance Examination 2076

Full Marks: 100

Time: 2 hrs.

Attempt all questions

Mathematics (25 × 1 = 25)

1. If $f(0) = 1, f(1) = 2, f(2) = 5, f(3) = 10$, then $f(-1) =$
 a. -3 b. 0 c. 1 d. 2
2. If $A \subseteq B$, then
 a. $A^c \subseteq B^c$ b. $A^c = B^c$ c. $B^c \subseteq A^c$ d. $B^c \not\subseteq A^c$
3. If $\log_a(ab) = x$, then $\log_b(ab) =$
 a. $\frac{x}{1-x}$ b. $\frac{1}{x}$ c. $\frac{x}{x-1}$ d. $\frac{x}{1+x}$
4. If $A = \begin{bmatrix} \frac{1}{3} & 2 \\ 0 & 2x-3 \end{bmatrix}, B = \begin{bmatrix} 3 & 6 \\ 0 & -1 \end{bmatrix}, AB = I$, then $x =$
 a. -1 b. 1 c. 0 d. 2
5. If $A^2 - A + I = 0$, then $A^{-1} =$
 a. $A - I$ b. A c. $I + A$ d. $I - A$
6. The sum of 3 number of G.P is 38 and their product is 1728. The middle terms is,
 a. 12 b. 8 c. 18 d. 6
7. Fourth roots of unity are
 a. $1, \omega, \omega^2, \omega^3$ b. $1, \omega, \omega^2, \omega^4$
 c. $\pm 1, \pm i$ d. cannot be determined
 Ans: $(\pm 1)^4 = 1$ and $(\pm i)^4 = 1$
8. The multiplicative inverse of $\frac{2+3i}{3-i}$ is:
 a. $\frac{1}{13} + \frac{2i}{13}$ b. $\frac{3}{13} + \frac{11i}{13}$
 c. $\frac{3}{13} + \frac{2i}{13}$ d. $\frac{3}{13} - \frac{11i}{13}$
9. If the roots of the equation $\frac{a}{x-a} + \frac{b}{x-b} = 1$ are numerically equal and opposite in sign, then
 a. $a - b = 0$ b. $a + b = 1$
 c. $a - b = 1$ d. $a + b = 0$
10. The remainder when $(kx^2 + x - 1)$ is divided by $(x + 2k)$ is:
 a. $(-2k + 1)$ b. $(k + 1)$
 c. $(4k^3 - 2k)$ d. $(4k^3 - 2k - 1)$
11. If $\cos^{-1} x = \cos^{-1}(\frac{3}{5}) - \sin^{-1}(\frac{4}{5})$, then $x =$
 a. 0 b. $\frac{1}{2}$ c. $\frac{\sqrt{3}}{2}$ d. 1
12. All values between 0 to 2π which satisfy $2\sin^2 \theta = 3\cos \theta$ is:
 a. $\frac{\pi}{3}, \frac{2\pi}{3}$ b. $\frac{\pi}{4}, \frac{3\pi}{4}$ c. $\frac{\pi}{3}, \frac{5\pi}{3}$ d. $\frac{\pi}{6}, \frac{2\pi}{6}$
13. The value of k for which the line pair $x^2 + kxy + 2y^2 + 3x + 5y + 2 = 0$ represents a straight line is
 a. 3 b. -4 c. 6 d. $\frac{7}{2}$
14. The number of common tangents that can be drawn to the two circles when they touch externally is:
 a. One b. two c. three d. four
15. The point of contact of the circle $x^2 + y^2 - 10x = 0$ with the chord $y = 2x$ are
 a. (2, 4), (0, 0) b. (0, 0), (1, 2)
 c. (3, 2), (-1, 4) d. (1, 3), (-2, 0)
16. The angle between the lines represented by $2x^2 + 7xy + 3y^2 = 0$ is:
 a. $\frac{\pi}{2}$ b. $\frac{\pi}{3}$ c. $\frac{\pi}{4}$ d. $\frac{\pi}{6}$

- a. $\frac{\pi}{4}$ b. $\frac{\pi}{6}$ c. $\frac{\pi}{2}$ d. $\frac{\pi}{3}$
17. $\lim_{x \rightarrow \infty} \frac{ax^2 + bx + c}{dx^2 + ex + f} =$
 a. $\frac{b}{e}$ b. $\frac{a}{d}$ c. $\frac{abc}{def}$ d. $\frac{ac}{bd}$
18. $\lim_{x \rightarrow 3} \frac{x^n - 3^n}{x - 3} = 27$, and n is a positive integer, then n =
 a. 6 b. 2 c. 3 d. 4
19. $\frac{d}{dx} \operatorname{cosech}^{-1} x =$
 a. $\frac{-1}{x\sqrt{x^2+1}}$ b. $\frac{-1}{x^2-1}$ c. $\frac{-1}{x\sqrt{1-x^2}}$ d. $\frac{1}{\sqrt{1-x^2}}$
20. If $y = \log_{\sqrt{x}} x$, then $\frac{dy}{dx} =$
 a. $\frac{1}{x}$ b. 1 c. $\frac{1}{x \log \sqrt{x}}$ d. 0
21. $\int \frac{1}{\sqrt{1-x^2}} dx =$
 a. $\cos^{-1} x + c$ b. $\sin^{-1} x + c$
 c. $\tan^{-1} x + c$ d. none
22. $\int \frac{\cos 2x}{\cos x} dx =$
 a. $2\sin x + \log(\sec x + \tan x)$
 b. $2\sin x - \log(\sec x + \tan x)$
 c. $2\cos x - \log(\tan x)$
 d. $2\cos x + \log(\sec x + \tan x)$
23. $\int a^{\sin x} \cos x dx =$
 a. $a^{\sin x} + c$ b. $\frac{a^{\sin x}}{\log a} + c$
 c. $a^{\sin x} - \log a + c$ d. none
24. The point of inflection of $y = x^3 - 12x^2$ is
 a. 12 b. -12 c. 0 d. 4
25. Area bounded by $y = \sin x, x$ -axis and the ordinates $x = 0$ and $x = 2\pi$ is:
 a. 0 b. 2 c. π d. 4

Physics (25 × 1 = 25)

26. The displacement of a particle moving along x-axis is given by $x = a + bt + ct^2$. The acceleration of the particle is
 a. b b. c c. b+d d. 2c
27. Two masses 1g and 4g are moving with equal K.E. the ratio of their momentum is
 a. 1:6 b. 1:2 c. 1:4 d. $1:\sqrt{2}$
28. The force of gravitational attraction on a body is
 a. Minimum at the equator
 b. Minimum at the poles
 c. Minimum midway between poles and equator
 d. Same at all points on the earth's surface
29. The surface energy of a drop of water of radius 'r' is proportional to
 a. r^3 b. r^2 c. r d. $1/r$
30. A body of volume 36cc floats with $\frac{3}{4}$ of its volume submerged in water. The density of body is
 a. 0.25 g/cc b. 0.75 g/cc
 c. 0.9 g/cc d. 0.1 g/cc
31. A perfect gas ($\gamma=1.5$) is compressed to one fourth of the original volume. If initial pressure of the gas is 1 atmosphere and the compression be adiabatic, then the final pressure will be
 a. 2 atm b. 4 atm c. 8 atm d. 16 atm
32. A black body is at a temperature 727°C . It emits energy at the rate which is proportional to

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- a. 727 b. $(727)^4$ c. 1000 d. $(1000)^4$
33. 8 g of water at 30°C is poured on a large block of ice at 0°C . The mass of ice that melts is
a. 30 g b. 50 g c. 150g d. 1600 g
34. Liquids boils when its vapor pressure is
a. Equal to total pressure on surface
b. Greater than total pressure on surface
c. Less than total pressure on surface
d. Equal to atmospheric pressure
35. The focal length of a convex lens is
a. Maximum for red color
b. Maximum for violet color
c. Maximum for yellow color
d. Same for all colors
36. The refracting angle of a prism of refractive index $\sqrt{2}$ is 60° . The minimum deviation from it is
a. 30° b. 45° c. 60° d. 90°
37. In young's double slit experiment of interference, the distance between the slits is gradually increased. The width of the fringe system
a. increases b. decreases
c. remain same
d. first increases and then decreases
38. 2% of light of emitted by a source of luminous intensity 500 cd falls normally on a circular disc of radius 10 cm, calculate the average illumination of surface.
a. 1000 lun b. 2000 lun
c. 3000 lun d. 4000 lun
39. A hollow metal sphere of radius 10cm is changed such that the potential at its surface is 80V. The potential at the center of sphere is
a. 8V b. 80V c. 800V d. zero
40. Two capacitors of capacitances $2\mu\text{F}$ and $3\mu\text{F}$ are connected in parallel. The ratio of charges on them will be
a. 1:1 b. 2:3 c. 3:2 d. 4:9
41. The angle between geographical and magnetic meridian is called
a. angle of dip b. angle of declination
c. critical angle d. curie angle
42. A charged particle moves along the axis of a current carrying solenoid. It experiences
a. an accelerating force b. a refracting force
c. a radial force d. no force
43. The energy dissipation in a resistor of resistance R in time t is E, then the value of current flowing in the resistance will be
a. $\sqrt{\frac{E}{Rt}}$ b. $\left(\frac{E}{Rt}\right)^2$ c. ERt d. $(ERt)^{1/2}$
44. The equation of a wave travelling in a string is given by $y = 3 \cos \pi (100t - x)$, where x and y are in cm and t is in second. Its wavelength is
a. 3 cm b. 100 cm c. 2 cm d. 5 cm
45. A source of frequency 150 Hz is moving in a direction of a person with a velocity of 110 m/s. The frequency heard by the person will be (Velocity of sound = 330 m/s).
a. 225 Hz b. 200 Hz c. 150 Hz d. 100 Hz
46. In stationary wave
a. strain is max. at nodes
b. strain is max. at antinodes
c. strain is min. at nodes
d. Amplitude is min. at all points
47. The de-Broglie wavelength of an electron in n^{th} Bohr orbit is related to the radius R of the orbit as,
a. $n\lambda = \pi R$ b. $n\lambda = \frac{3}{2}\pi R$
c. $n\lambda = 2\pi R$ d. $n\lambda = 4\pi R$
48. Which of the following electronic transitions of the hydrogen atom gives an absorption line of highest frequency?
a. $n = 1$ to $n = 2$ b. $n = 3$ to $n = 8$
c. $n = 2$ to $n = 1$ d. $n = 8$ to $n = 3$
49. The half-life of a radioactive isotope is 5 yrs. The fraction of atoms decayed in this substance after 15 years will be
a. 1 b. $\frac{3}{4}$ c. $\frac{1}{8}$ d. $\frac{7}{8}$
50. What are β - rays ?
a. E.M waves
b. Electron orbiting round the nucleus
c. Charge particle emitted by nucleus
d. Neutral particle
- English (25 × 1 = 25)**
51. He met the wounded soldiers and helped
a. them b. him c. himself d. themselves
52. He cut ... with a knife.
a. Itself b. herself c. himself d. themselves
53. The leader, with his helpers,stolen the bags.
a. Have b. has c. having d. were
54. Her husband and she ... gone home.
a. Has b. have c. having d. is
55. One should not mock at the poor, ...?
a. Shouldn't one b. should one
c. should he d. shouldn't he
56. Those books are not yours, ...?
a. are they b. aren't they
c. are those d. aren't yours
57. He lived in this city ... ten years.
a. For b. till c. to d. during
58. Sit ... me.
a. Besides b. beside c. to d. between
59. Unless you use English, ...
a. It will not improve b. It will improve
c. It would improve d. It would not improve
60. If he had tried, ...
a. He will win the prize.
b. He would have won the prize.
c. He would win the prize.
d. He wouldn't have won the prize.
61. He plays ... football.
a. a b. an c. the d. no article
62. He went to ... theatre.
a. a b. an c. the d. no article
63. What is an antonym of 'sow'?
a. Spread b. reap c. grow d. take
64. What is an antonym of 'faulty'?
a. Flawless b. wrong c. faculty d. strong

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65. What is a synonym of 'check'?
- a. Test b. cheap c. attentive d. win
66. What is a synonym of 'present'?
- a. Free b. gift c. suggest d. greet
67. The passive form of 'Do we eat sand?'
- a. Is sand eaten? b. Was sand eaten?
c. Did we eat sand? d. Sand is eaten.
68. The passive form of 'People sell fish here.'
- a. Fish was sold here b. Fish is sold here.
c. Fish is being sold here d. Fish sold here.
69. She said to me, "I will do it myself."
- a. She tells me that she will do it herself.
b. She told to do it herself.
c. She told me that she would do it herself.
d. she did it herself.
70. Rekha said, "Open your mouth."
- a. Rekha told me to open my mouth.
b. Rekha opened her mouth.
c. Rekha said to open her mouth.
d. Rekha told me to open her mouth.
71. He ... to Pokhara every year.
- a. Goes b. is going c. has gone d. is
72. The fear of height is called ...
- a. Acrophobia b. bathophobia
c. heightphobia d. none
73. He ... before the doctor arrived.
- a. Has died b. had died c. die d. has die
74. The word 'fire' takes the prefix...
- a. Mis b. mono c. micro d. mid
75. The present participle of 'die' is...
- a. Dieing b. died c. dies d. dying
- Chemistry (25 × 1 = 25)**
76. The secondary suffix of the IUPAC name of the compound $\text{CHO} - \text{CH}_2 - \text{CHOH} - \text{COOH}$ is
- a. ol b. al c. oic acid d. oal
77. The intermediate product markovnikov's in addition is
- a. Carbocation b. free radical
c. Carbanion d. All of above
78. Acetylene contains
- a. 2π and 3σ bond b. 3π and 2σ bond
c. 4σ and 2π bond d. none
79. Lewis acid and oxidizing agents are
- a. Electrophiles b. Nucleophiles
c. Both a and b d. None
80. Wurtz reaction cannot be applied to prepared
- a. Methane b. Ethane
c. Butane d. Hexane
81. Which of the following will show common ion effect
- a. $\text{HCl} + \text{HNO}_3$ b. $\text{HCl} + \text{NaCl}$
c. $\text{HCl} + \text{H}_2\text{S}$ d. All of above
82. Carboxylic acid has general formula as
- a. $\text{C}_n\text{H}_{2n+2}$ b. $\text{C}_n\text{H}_{2n}\text{O}$
c. $\text{C}_n\text{H}_{2n}\text{O}_2$ d. $\text{C}_n\text{H}_{2n+2}\text{O}$
83. $\text{C}_6\text{H}_{12}\text{O}_6$ is formula of
- a. Glucose b. fructose
c. Galactose d. all of above
84. The mass of product is equal to mass of reactants. It is
- a. Law of multiple proportion b. Law of definite proportion
c. Law of conservation of mass
d. Law of combining volume
85. Which of the following orbital has highest energy level
- a. 4d b. 3d c. 5s d. 4p
86. Oxidation state of oxygen in peroxide
- a. 1 b. -1 c. -2 d. 2
87. Potential of hydrogen electrode is
- a. Zero b. positive c. negative d. all
88. Which of the following has highest size?
- a. Na b. Mg^+ c. Al^{++} d. All have equal size
89. The molarity of pure water is
- a. 0.018M b. 18M c. 50M d. 55.55M
90. Radioactive isotopes of hydrogen is
- a. Protium b. deuterium
c. Tritium d. all of above
91. The catalyst used in the contact process is
- a. V_2O_5 b. $\text{Fe}(\text{OH})_3$ c. CaO d. Fe
92. Chemical formula of white vitriol
- a. ZnS b. $\text{ZnSO}_4 \cdot 7\text{H}_2\text{O}$
c. FeS d. $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$
93. The type of bonding in protein is
- a. Hydrogen bond b. covalent bond
c. peptide bond d. all of above
94. The color of dye is due to presence of certain group containing multiple bonds called
- a. Chromophore b. auxochrome
c. both d. none
95. Molecular formula of calomel is
- a. HgCl_2 b. Hg_2Cl_2
c. $\text{Hg} + \text{HgCl}_2$ d. $\text{Hg}_2\text{Cl}_2 + \text{Hg}$
96. FeSO_4 forms brown ring with
- a. NO_3 b. NO_2 c. NO d. N_2O
97. Chalcopyrite is commonly known as
- a. Matte b. lunar caustic
c. fool's gold d. none
98. How many structural isomers are possible for C_6H_{14}
- a. 3 b. 4 c. 5 d. 7
99. Rate of first order reaction depends upon
- a. Time b. temperature
c. conc. of reactant d. all of above
100. Which of the following is neutral oxide?
- a. CO_2 b. H_2O c. N_2O_3 d. ZnO