TRIBHUVAN UNIVERSITY

INSTITUTE OF SCIENCE & TECHNOLOGY

BScCSIT Model Entrance Examination–2025

2082-5-07

Attempt all Questions

Choose the correct answer and blacken the appropriate bubble using gel pen on answer sheet.

Full Marks: 100 **Time:** 2 hour

1. The logically equivalent statement of $\sim(p \wedge q)$ is
   a) $\sim p \Rightarrow \sim q$ b) $\sim p \vee \sim q$ c) $\sim p \wedge \sim q$ d) $\sim q \Rightarrow \sim p$
2. The inequality $|3x + 2| \leq 1$ is same as
   a) $-1 \leq x \leq \frac{1}{3}$ b) $-1 \leq x \leq 3$ c) $-1 \leq x \leq -\frac{1}{3}$ d) $-1 \leq x \leq 5$
3. The value of $l\text{n}(xy) - l\text{n}\left(\frac{x}{y}\right)$ is
   a) $2l\text{n}x$ b) $2l\text{n}y$ c) $2(l\text{n}x - l\text{n}y)$ d) $l\text{n}x - l\text{n}y$
4. Let A = {a, b, c, d} and B = {1, 2, 3}.
   The which of the following is not true?
   a) $n(A \times B) = n(B \times A)$ b) $A \times B = B \times A$
   c) $n(A) \neq n(B)$ d) $n(A \cup B) = n(B \cup A)$
5. The graph of $f(x) = \log_a x$ is obtained from the graph of $g(x) = a^x$ by
   a) reflecting about x-axis b) reflecting about y-axis
   c) reflecting about the line y = x d) reflecting about the line y = –x
6. The general solution of $\tan\theta \tan 2\theta = 1$ is
   a) $n\pi + \frac{\pi}{3}$ b) $(6n \pm 1)\pi$ c) $(2n + 1)\frac{\pi}{6}$ d) $(2n + 1)\frac{\pi}{4}$
7. If $\cos^{-1}x + \cos^{-1}y = \frac{\pi}{2}$ then $x^2 + y^2 =$
   a) 0 b) $\frac{1}{2}$ c) 1 d) 2
8. If the ratio of the 5^{th} term is to 11^{th} term of an A.P. is 5:2 then $t_{15} =$
   a) 7 b) 15 c) –13 d) 0
9. The sum of the series
   $(1^2 - 2^2) + (3^2 - 4^2) + (5^2 - 6^2) + (7^2 - 8^2) +$ ..... upto n terms is
   a) $\frac{n(n + 1)}{2}$ b) $-\frac{n(n + 1)}{2}$ c) $n(2n + 1)$ d) $-n(2n + 1)$
10. The product of n^{th} roots of unity is
    a) $(-1)^{n-1}$ b) –1 c) 0 d) 1

11. If the area of triangle formed by the points z, iz and z + iz on the complex plane is 18 then the value of |z| is

a) 2 b) 3 c) 5 d) 6

12. $\begin{vmatrix} x+y & y+z & z+x \\ z & x & y \\ 1 & 1 & 1 \end{vmatrix} =$

a) x + y + z b) 1 c) 0 d) xyz

13. Which of the following matrix is not invertible?

a) $\begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix}$ b) $\begin{bmatrix} -1 & -1 \\ 1 & 2 \end{bmatrix}$ c) $\begin{bmatrix} 2 & 3 \\ 4 & 6 \end{bmatrix}$ d) $\begin{bmatrix} 2 & -2 \\ 1 & 1 \end{bmatrix}$

14. The number of solutions of the equation |x| = cosx is

a) 0 b) 1 c) 2 d) 3

15. The equation of the bisectors of the angles between the lines represented by $2x^2 - 6xy - y^2 = 0$ is

a) $x^2 + xy + y^2 = 0$ b) $x^2 - xy - y^2 = 0$
c) $x^2 - xy + y^2 = 0$ d) $y^2 - xy - x^2 = 0$

16. The polar coordinates of the point $(\sqrt{3}, 1)$ is

a) $\left(2, \frac{\pi}{3}\right)$ b) $\left(2, \frac{7\pi}{6}\right)$ c) $\left(2, \frac{\pi}{6}\right)$ d) $\left(4, \frac{\pi}{2}\right)$

17. Equation of circle is given by $x^2 + y^2 - 2x - 4y + 2 = 0$. The point (1, 4) lines

a) inside the circle b) outside the circle
c) on the circle d) none

18. $\lim_{x \to 0} \frac{\sin ax + bx}{ax + \sin bx} =$

a) a b) b c) $\frac{a}{b}$ d) 1

19. The function $f(x) = \sin\frac{1}{x}$ at x = 0 has

a) jump discentinuity b) osillating discontinuity
c) infinite discontinuity d) removable discontinuity

20. If $\sqrt{x} + \sqrt{y} = 4$ then the value of $\frac{dy}{dx}$ at x = 1 is

a) –1 b) –2 c) –3 d) 1

21. If $y = u^2 + 2u + 1$ and $u = x^3$ then $\frac{dy}{dx} =$

a) $6x^2 (x^3 + 1)$ b) $3x^2 (x^3 + 1)$ c) $x^3 + 1$ d) $12x^2 (x^3 + 1)$

22. If the distance s of a particle which moves in a straight line is given by $s = 3t^3 - 4t^2 + 1$, then the acceleration at $t = 2$ is

a) 20 b) 28 c) 18 d) 22

23. $\int \frac{1}{\sqrt{x}}\,dx =$

a) $\frac{2}{\sqrt{x}} + c$ b) $2\sqrt{x} + c$ c) $\sqrt{x} + c$ d) $ln\sqrt{x} + c$

24. $\int_0^{\pi} (1 + \cos x)\,dx =$

a) 0 b) $\frac{\pi}{2}$ c) $\frac{\pi}{3}$ d) π

25. The area bounded by the curve $x^2 = 4a(y - 2a)$, $y = 6a$ and y-axis is

a) $\frac{32}{5}a^2$ b) $\frac{32}{3}a^2$ c) $\frac{16}{3}a^2$ d) $\frac{8}{3}a^2$

26. What is dimensional formula of Planck's constant?

a) $M^{-1}L^2T^2$ b) ML^2T^{-1} c) $M^{-1}L^3T^{-2}$ d) $M^0L^2T^{-2}$

27. If the displacement of the body is proportional to square of the time, the body has

a) Uniform velocity b) Uniform acceleration
c) Increasing acceleration d) Decreasing acceleration

28. The moment of inertia of a spherical shell about a tangent is

a) $\frac{2}{3}MR^2$ b) $\frac{2}{5}MR^2$ c) $\frac{5}{3}MR^2$ d) $\frac{7}{5}MR^2$

29. Two springs of force constants K_1 and K_2 are arranged in series and a mass M is attached to it. The time period of mass (M) vibrating up and down will be

a) $2\pi\sqrt{\frac{M}{K_1 + K_2}}$ b) $2\pi\sqrt{\frac{M}{K_1K_2}}$ c) $2\pi\sqrt{\frac{M(K_1 + K_2)}{K_1K_2}}$ d) $2\pi\sqrt{\frac{MK_1K_2}{K_1 + K_2}}$

30. Bernoulli's theorem is true for

a) Incompressible and viscous fluid b) Compressible and viscous fluid
c) Incompressible and non-viscous fluid d) Compressible and non-viscous fluid

31. Two particles of equal masses are revolving in circular paths of radii r_1 and r_2 respectively with same speed. What is the ratio of their centripetal force?

a) $\frac{r_1}{r_2}$ b) $\frac{r_2}{r_1}$ c) $\left(\frac{r_1}{r_2}\right)^2$ d) $\left(\frac{r_2}{r_1}\right)^2$

32. The absolute zero temperature is

a) –273.14°C b) –273.14 K c) –273.16 K d) –273.16°C

33. A steel tape gives correct measurement at 20°C. A piece of wood is being measured with steel tape at 0°C. The reading is 25 cm on the tape. The real length of the piece of wood must be

a) 25 cm b) < 25 cm c) > 25 cm d) Can't be said

34. Relative humidity is 100% then the room temperature is equal to
    a) 4°C b) 0°C c) Dew point d) 100°C
35. Angle between particle velocity and wave velocity in transverse wave is
    a) π b) 0 c) $\frac{\pi}{2}$ d) $\frac{\pi}{4}$
36. Two plane waves of same frequency having intensities I and 4I, are travelling in same direction. The resultant intensity at minima is
    a) I b) 3I c) 5I d) 9I
37. What happens to the intensity of sound when one of the prongs of tuning fork gets broken slightly?
    a) Intensity increases b) Intensity decreased
    c) Intensity 1st increase then decrease d) Intensity 1st decrease then increase
38. Focal length of concave mirror is 30 cm. If image is 5 times magnified. Then object distance will be?
    a) 30 cm b) 36 cm c) 40 cm d) 41 cm
39. Resolving power of human eye is nearly in second
    a) 342 b) $\frac{1}{342}$ c) 3420 d) $\frac{1}{3420}$
40. Illumunance at a point 2 m from a source of light of luminous intensity 100 candela is
    a) 50 lux b) 25 lux c) 50 cd/m^2 d) 25 cd/m^2
41. There are two charges +1μC and +3μC. The ratio of the forces acting on them will be
    a) 1:3 b) 3:1 c) 1:25 d) 1:1
42. A dielectric has strength of 10^6 V/m. The minimum voltage to be applied across a 1 mm thick specimen to puncture it is
    a) 10^6 V b) 10^9 V c) 10^3 V d) 2×10^6 V
43. In a charged capacitor the energy resides
    a) On +ve plate b) On both +ve & –ve plate
    c) In the field between the plate d) On –ve plate
44. Diameter of Nichrome wire is reduced to half, now the real resistance is
    a) 2 times b) 4 times c) 8 times d) 16 times
45. Two bulb 25 W, 200 W has resistance in the ratio
    a) 1:8 b) 8:1 c) 1:64 d) 64:1
46. When the temperature increase, the magnetic moment of a magnet
    a) Increase b) Decrease c) Remains same d) None
47. Energy stored in the magnetic field of 2.5×10^{-3}T is
    a) 2.48 J b) 0.48 J c) 3.48 J d) 4.48 J
48. The wavelength of an electron of energy 10 KeV will be
    a) 0.12 Å b) 1.2 Å c) 12 Å d) 120 Å

49. Quantum theory is explained by
    a) Photon b) Positron c) Electron d) None

50. An X-ray tube is operated at 20 KV. The maximum speed of e^- striking the anticathode will be
    a) 4.2×10^7 m/s b) 8.4×10^7 m/s c) 8.4×10^9 m/s d) 4.8×10^7m/s

51. The maximum number of electrons that can be accommodated in a quantum shell is
    a) n b) n^2 c) $2n^2$ d) n(n + 1)

52. The vapour density of a gas is 11.2. The volume occupied by 11.2g of this gas at NTP is
    a) 1 L b) 11.2 L c) 22.4 L d) 20 L

53. The normality of 10% (weight/volume) acetic acids is
    a) 1 N b) 10 N c) 1.7 N d) 0.83 N

54. For a reaction $2A + B \rightleftharpoons C + D$ the active mass of B is kept constant and that of 'A' is tripled. It is observed that the rate of reaction.
    a) Decreased 3 times b) Decreased by 9 times
    c) Increases 6 times d) Increases 9 times

55. If the acidic solution is diluted 10 times, then pH becomes
    a) 7 b) Less than 7
    c) More than 7 d) Negative

56. The increasing order of acid strength $HClO_4$, $HClO_3$, $HClO_2$, HClO is
    a) $HClO < HClO_2 < HClO_3 < HClO_4$ b) $HClO_4 < HClO_3 < HClO_2 < HClO$
    c) $HClO_4 < HClO_2 < HClO < HClO_3$ d) $HClO < HClO_4 < HClO_3 < HClO_2$

57. Which of the following is most powerful oxidizing agent
    a) F_2 b) Cl_2 c) Br_2 d) I_2

58. The substance decomposed according to zero order kinetics. If the rate constant is 'K' and the initial concentration is 'a' then half life period will be
    a) $\frac{1}{aK}$ b) $\frac{K}{2}$ c) $\frac{aK}{2}$ d) $\frac{a}{2K}$

59. The number of molecules in 4.25 g of NH_3 is about
    a) 1.0×10^{23} b) 1.5×10^{23} c) 2.0×10^{23} d) 2.5×10^{23}

60. Molten NaCl conduct electricity due to the presence of
    a) Free electrons b) Free ions c) Free molecule d) Na and Cl atoms

61. The cost of electricity required to deposite 1 gm of Mg is Rs. 5.00. How would it cost to deposite 10g of Al? (Al = 27, Mg = 24)
    a) Rs. 10.00 b) Rs. 27.00 c) Rs. 44.47 d) Rs. 66.67

62. Enthalpy for the reaction $C + O_2 \rightarrow CO_2$ is
    a) Positive b) Negative c) Zero d) None

63. Long form of periodic table is based on
    a) Atomic size b) Atomic mass c) Atomic number d) Electronegativity
64. Temporary hardness is due to the presence of
    a) $NaHCO_3$ b) $Ca(HCO_3)_2$ c) Na_2SO_4 d) $CaSO_4$
65. The reaction of Na with H_2O is
    a) Endothermic b) Exothermic c) Reversible d) Very slow
66. Bordeaux mixture is
    a) Lime + $CuSO_4$ b) Lime + CuO c) Lime + $CaCO_3$ d) CuO + $CuSO_4$
67. Common alum is
    a) $K_2SO_4.Al_2(SO_4)_3.24H_2O$ b) $K_2SO_4.Cr_2(SO_4)_3.24H_2O$
    c) $K_2SO_4.Fe_2(SO_4)_3.24H_2O$ d) $(NH_4)_2SO_4.6H_2O$
68. Graphite is good conductor of electricity because
    a) There is covalency among carbon atoms
    b) The carbon atoms of each plane are sp^2 hybridized
    c) Its electrons are delocalized in each plane
    d) There is vander wall's bond between the plane of carbon atom
69. Heating of ammonium nitrate gives
    a) NH_3 b) HNO_3 c) NO_2 d) N_2O
70. The catalyst used in the manufacture of H_2SO_4 by contact process is
    a) Platinized asbestos b) Iron
    c) Nickel d) Oxides of nitrogen
71. Strongest acid among the following is
    a) HClO b) $HClO_2$ c) $HClO_3$ d) $HClO_4$
72. Tautomerism will be exhibited by
    a) $(CH_3)_2NH$ b) $(CH_3)_3CNO$ c) RCH_2NO_2 d) R_3CNO_2
73. Species containing carbon with three bonds and an electron are called
    a) Carbenes b) Carbanions c) Corbonium ions d) Free radical
74. Which is not linked with methane?
    a) Marsh gas b) Natural gas c) Producer gas d) Coal gas
75. When iodoform is heated with silver powder it forms
    a) Acetylene b) Ethylene c) Methane d) Ethane
76. Sporadic:
    a) occasional b) frequently c) continuously d) never ending
77. Sinister:
    a) sometimes b) ominous c) abstain d) abound

78. Rebellions:

a) submissive b) proud c) pompous d) spiteful

79. Abundant:

a) scarcity b) plentiful c) enormons d) lovely

80. Morbid fear of being poisoned:

a) Toxophobia b) Xenophobia c) Ochlophobia d) Sitophobia

81. Lover of words:

a) philologist b) bibliophile c) cheirophile d) paedophile

82. As ageless as …….

a) the moon b) the sun c) the hills d) glass

83. As chargeable as ……. .

a) weather b) climate c) the moon d) the sun

84. To meet one's waterloo:

a) to die fighting b) to die an ignoble death
c) to meet one's final defeat d) to meet a strong adversary

85. To smell a rat:

a) to smell bad smell b) to see hidden meaning
c) to suspect a trick d) to misunderstand

86. You and I ….. working.

a) are b) am c) was d) be

87. Rice and curry ….. his favourite dish.

a) is b) are c) were d) be

88. This house is occupied …… them.

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

89. The beggar was lame ….. one leg.

a) from b) of c) with d) off

90. I am obliged ….. him for his kindness:

a) to b) with c) for d) on

91. The information you put into the computer is called?

a) Facts b) Data c) Files d) Directory

92. A button that makes character either upper or lower case and numbers to symbols is
    a) Tab Key b) Ctrl Key c) Shift Key d) Alt Key
93. Data that is copied from an application is stored in the ....
    a) Driver b) Clipboard c) Terminal d) Prompt
94. What is the main folder on a storage device called?
    a) Platform b) Interface c) Root directory d) Home page
95. Which among the following memories is used in digital camera?
    a) Virtual memory b) Flash memory c) Main memory d) Cache memory
96. Which of the following is a permanent memory in the computer?
    a) RAM b) ROM c) CPU d) CDROM
97. BIOS is used by
    a) Operating system b) Compiler
    c) Interpreter d) Application software
98. When does page fault occur?
    a) The page is present in memory b) The deadlock occurs
    c) The page doesnot present in memory d) The buffering occurs
99. The IT policy 2057 was first reviewed in
    a) 2061 BS b) 2067 BS c) 2069 BS d) 2971 BS
100. .... a type of antivirus program?
    a) Quick heal b) Mcafee c) Kaspersky d) All of above

...Best of Luck...