



Nepal College of Information Technology

BE Entrance Examination **Model Question**

Entrance Roll _____

Date _____

Time: 1.5 Hrs

General Guidelines to Examinees

1. Occupy your own seat.
2. Write your Entrance Roll Number clearly, both on the Entrance test question booklet and on the entrance test answer sheet.
3. During exam period, you will not be allowed to leave the exam hall without submitting the question/answer sheet.
4. You will not be allowed to disturb other examinees by asking for calculators, pencils, rulers, etc.
5. You are provided with a separate Answer Sheet in which you are required to darken (using a pencil) the appropriate answer lettered choice box against the question number.

For example, if the proper answer to question number 5 is choice D, then in the answer sheet provided darken the lettered choice box D against number 5 in the answer sheet.

5. A B C D

6. For correction of a wrong answer choice, cross-mark the already darkened wrong answer lettered choice box, and then re-darken the appropriate answer lettered choice box against the question number.

For example, later on, if you feel that the proper answers to question number 5 is choice D, not B, then in the answer sheet provided, cross-mark the previously darkened lettered choice box B and then darken the lettered choice box D against number 5 in the answer sheet.

5. A B C D

7. For your rough use, use back side (blank portion) of the answer sheet. You will not be given any extra papers.
8. Subject wise marks distribution are as follows:

Name of Subject	Marks
Mathematics	40
Physics	30
Chemistry	20
English	10
Total Marks	100

Entrance Roll No. _____ Programme _____

Applicant's Name _____

Address _____

Phone Number _____

12. $\frac{1}{2} \log_{10} 25 - \log_{10} 9 + \log_{10} 18$ equals
 A. 0
 B. 1
 C. $\log_{10} 34$
 D. none
13. The value of the determinant $\begin{vmatrix} 1! & 2! & 3! \\ 2! & 3! & 4! \\ 3! & 4! & 5! \end{vmatrix}$ is
 A. 0
 B. 1!
 C. 4!
 D. 5!
14. If $f: \mathbb{R} \rightarrow \mathbb{R}$ is a function defined by $f(x) = 10x - 7$. If $g = f^{-1}$ then $g(x)$ equals
 A. $\frac{1}{10x-7}$
 B. $\frac{1}{10x+7}$
 C. $\frac{x+7}{10}$
 D. $\frac{x-7}{10}$
15. The value of the parameter α , for which the function $f(x) = 1 + \alpha x$, (α is not equal to 0) is the inverse of itself is
 A. -2
 B. -1
 C. 1
 D. 2
16. If z is a complex number then which one of the following is not true
 A. $|z^2| = |z|^2$
 B. $|z^2| = |z|^2$
 C. $z = \bar{z}$
 D. $\bar{z}^2 = \bar{z}^2$
17. $6^1, 6^{1/2}, 6^{1/4}, 6^{1/8}, \dots$ to ∞ equals
 A. 0
 B. ∞
 C. 6
 D. 36
18. If the sum of roots of a quadratic equation is 1 and the sum of their square is 13 then the quadratic equation is
 A. $x^2 - x - 6 = 0$
 B. $x^2 + x + 6 = 0$
 C. $x^2 - x + 6 = 0$
 D. $x^2 - x - 13 = 0$
19. the value of $47C_4 + \sum_{j=1}^5 (52-j) C_3$ is equal to
 A. $47C_5$
 B. $52C_5$
 C. $52C_4$
 D. $51C_4$
20. In the expansion of $(1+x)^{50}$, the sum of coefficients of odd powers of x is
 A. 0
 B. 2^{49}
 C. 2^{50}
 D. 2^{51}
21. The domain of the real function $f(x) = \sqrt{x^2 + x - 6} + \sqrt{4 + 3x - x^2}$ is
 A. $[2, 4]$
 B. $[1, 4]$
 C. $[-3, 1]$
 D. $(-\infty, -3) \cup [4, \infty)$
22. $-\log_2 \log_2 \sqrt{\sqrt{\sqrt{\sqrt{2}}}}$ is equal to
 A. m
 B. n
 C. $m+n$
 D. 4
23. If $\begin{vmatrix} -a^2 & ab & ac \\ ab & -b^2 & bc \\ ac & bc & -c^2 \end{vmatrix} = \lambda a^2 b^2 c^2$ then λ equals
 A. 1
 B. 2
 C. 3
 D. 4
24. The number of bijection function from set A to itself when A contains 100 elements is
 A. 100
 B. $(100)^2$
 C. $100!$
 D. 2^{100}
25. If $f(x) = \log\left(\frac{1-x}{1+x}\right)$ then $f\left(\frac{2x}{1+x^2}\right)$ equals
 A. $f(x)$
 B. $2f(x)$
 C. $3f(x)$
 D. $4f(x)$

26. The true statement is
 A. $1-i < 1+i$
 B. $1+2i > 1-2i$
 C. $2i > 1$
 D. none
27. $\sqrt{6+\sqrt{6+\dots\infty}}$
 A. 6
 B. $\sqrt{6}$
 C. 3
 D. $\sqrt{3}$
28. If the roots of the quadratic $x^2 + ax + c = 0$ differ by 1, then a^2 is always equal to
 A. $4c+1$
 B. $4c-1$
 C. $4c$
 D. $4c \pm 1$
29. If ${}^nC_{r-1} = 36$, ${}^nC_r = 84$, ${}^nC_{r+1} = 126$ then the value of n and r are respectively equal to
 A. 9, 3
 B. 3, 9
 C. 2, 7
 D. 7, 2
30. If the 21st and 22nd terms in the expansion of $(1+x)^{44}$ are equal then the value of x must be
 A. $7/8$
 B. $9/8$
 C. $11/8$
 D. $13/8$
31. If A and B are two sets such that $A \cap B \neq \phi$, then $A - (A - B)$ is equal to
 A. ϕ
 B. B
 C. $A \cap B$
 D. $B - 2A$
32. The domain of the function $f:R \rightarrow R$ defined by $f(x) = \frac{1}{\sqrt{9-x^2}}$, $x \in R$ is
 A. $R - \{-1, 3\}$
 B. $\{-3, 3\}$
 C. $[-3, 3]$
 D. $(-3, 3)$
33. $\lim_{x \rightarrow 0} \frac{\log(1+x)}{3^x - 1}$ is equal
 A. 0
 B. $\log_e 3$
 C. $\log_e 3e$
 D. ∞
34. How should one choose the value of $f(0)$ so that the function $f(x) = 3-x \sin 1/x$ is continuous at $x=0$?
 A. 0
 B. 3
 C. -3
 D. impossible to choose
35. If $A = (-3)$ is 1×1 matrix, then its determinant is
 A. 3
 B. 1
 C. -3
 D. 9
36. When the function $f(x) = x^3 + 3x^2 - \lambda x + 4$ is divided by $x-2$, then remainder is λ . The value of λ is
 A. 0
 B. 2
 C. 4
 D. 8
37. The principal value of θ which satisfied $\sin\theta = \frac{\sqrt{3}}{2}$ and $\cos\theta = \frac{1}{2}$ is
 A. $\frac{\pi}{2}$
 B. $\frac{\pi}{3}$
 C. $\frac{\pi}{4}$
 D. $\frac{\pi}{6}$
38. The direction cosine of a line joining the points $M(2,3,5)$ and $N(-1,3,2)$ are
 A. $0, \frac{1}{\sqrt{2}}, 0$
 B. $\frac{1}{\sqrt{2}}, 0, \frac{1}{\sqrt{2}}$
 C. $-\frac{1}{\sqrt{2}}, 0, \frac{1}{\sqrt{2}}$
 D. $\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}$
39. Distance between the planes parallel to each other $2x + y + 2z + 8 = 0$ and $4x + 2y + 4z + 5 = 0$
 A. 11
 B. $\frac{11}{6}$
 C. $\frac{11}{4}$
 D. $\frac{11}{2}$
40. If the vector $a = i - 2j + 4k$ and $b = 2i + 7j + \lambda k$ are normal to each other, then $\lambda = ?$
 A. 0
 B. 2
 C. 3
 D. 4

SECTION: PHYSICS

Select the best alternatives:

[30 × 1 = 30]

41. A body moving in a circular motion with constant speed has constant

A. velocity	B. acceleration
C. KE	D. displacement
42. With increase in temperature, the viscosity of

A. gas decreases and liquid increases	B. gas increases & liquid decreases
C. both liquid & gas increases	D. both liquid and gas increases
43. Steam is passed through the water contained in a beaker. The water can boil when steam is at

A. atmospheric pressure	B. pressure above atmospheric pressure
C. pressure below atmospheric pressure	D. any pressure
44. The critical angle of light passing from glass to air is minimum for

A. red	B. green
C. yellow	D. violet
45. Velocity of sound in a gas is proportional to

A. square root of adiabatic elasticity	B. adiabatic elasticity
C. square root of isothermal elasticity	D. isothermal elasticity
46. Two charged spheres of radii 10cm and 15cm are connected by a thin wire. No current flow if they have

A. same charge	B. same potential
C. same field intensities on surface	D. same energy
47. The specific resistance of a wire

A. varies with its length	
B. varies with cross section	
C. varies with its mass	
D. does not depends on its length, cross section and mass	
48. The time period of a freely suspended magnet does not depend upon

A. length of the magnet	B. pole strength of magnet
C. horizontal component of magnetic field	D. length of the suspension
49. By increasing the intensity of incident light on the surface of a metal

A. KE of photoelectrons increases	B. Number of emitted electrons increases
C. KE & number of electrons increases	D. no effect
50. If n_e & n_h are the number of electrons and holes in a semiconductor heavily doped with phosphorus then

A. $n_e \gg n_h$	B. $n_e \ll n_h$
C. $n_e \leq n_h$	D. $n_e = n_h$
51. If the radius of earth were to shrink by one percent, its mass remaining the same, the acceleration due to gravity on the surface of earth would

A. decrease	B. remain unchanged
C. increases	D. depends on initial size
52. A cable that can support a load W is cut into two equal parts. The maximum load that can be supported by either part is

A. $\frac{W}{4}$	B. $\frac{W}{2}$
C. W	D. $2W$
53. In a stationary wave

A. energy is uniformly distributed	
B. energy is maximum at nodes and minimum at antinodes	
C. energy is minimum at nodes & maximum at antinodes	
D. energy is distributed non uniformly	
54. Two metal strips that constitute a thermostat must necessarily differ in their

A. mass	B. length
C. resistivity	D. coefficient of linear expansion

55. A sphere, a cube and a thin circular plate all made of same material and having the same mass are initially heated to 200°C . They are left in air at room temp then the body will cool fastest is
A. sphere
B. cube
C. circular plate
D. all at same rate
56. A dielectric is introduced between the elements of the condenser kept at a constant potential difference. The charge on condenser
A. decreases
B. increases
C. remain same
D. none
57. A current is passed through a straight wire. The magnetic field established around it has its lines of forces
A. circular and endless
B. oval and endless
C. straight
D. all are true
58. If the angular speed of rotation of an armature of alternating current in generation is doubled, then the induced emf will be
A. twice
B. four times
C. same
D. half
59. A plane glass slab is placed over various coloured letters. The letter which appears to be raised the least is
A. violet
B. yellow
C. red
D. green
60. The frequency of incident light falling on a photosensitive metal plate is doubled, the kinetic energy of emitted photo electron is
A. double the earlier value
B. unchanged
C. more than doubled
D. less than doubled
61. If a man want to hit a target, he should point his rifle in a direction
A. higher than target
B. lower than the largest
C. straight to target
D. any of above
62. The collision in which the relative velocity after collision is zero is
A. perfectly elastic collision
B. perfectly inelastic collision
C. semi elastic collision
D. may be elastic or inelastic
63. An iron cube floats in a vessel of mercury at 20°C the temperature increased to 100°C , the cube will float
A. lower
B. higher
C. at same level
D. lower or higher
64. Voice of women is shriller because
A. pitch of their organ pipe is more
B. have more energy
C. amplitude of vibration is more
D. can control their tongue
65. Refractive index of a medium is lowest for
A. red light
B. violet light
C. green light
D. yellow light
66. In a reflecting astronomical telescope parabolic mirrors are use because they are free from
A. spherical aberration
B. chromatic aberration
C. spherical & chromatic aberration
D. no aberration
67. When distance between two charged particles is halved, the coulomb force between them become
A. one half
B. one fourth
C. double
D. four times
68. The terminal potential difference of a cell when short circuited is
A. E
B. E/3
C. E/2
D. 0
69. Sensitivity of a moving coil galvanometer can be increased by decreasing
A. number of turns in coil
B. area of coil
C. magnetic field
D. couple per unit twist of suspension
70. Nuclear forces are
A. short range
B. always attractive
C. charge independent
D. all of above

SECTION: CHEMISTRY

[20 × 1 = 20]

Select the best alternatives:

71. Splitting of line spectra in magnetic field is called
 A. Zeeman effect
 B. Stark effect
 C. de-Broglie hypothesis
 D. Bohr's effect
72. The oxidation number of Na in Na-amalgam is
 A. +1
 B. -1
 C. 0
 D. +2
73. Maximum covalent character is found in
 A. HF
 B. HCl
 C. HBr
 D. HI
74. 'Al' bears a diagonal relationship with
 A. Be
 B. B
 C. carbon
 D. Mg
75. 1 mole of glucose contains ___ moles of carbon.
 A. one
 B. two
 C. six
 D. twelve
76. Which of the following is used as a reducing agent in smelting?
 A. C
 B. Al
 C. Zn
 D. Fe
77. Rolled gold contains
 A. Cu & Zn
 B. Cu & Sn
 C. Cu & Au
 D. Cu & Al
78. Spelter is
 A. impure Cu
 B. impure Zn
 C. ZnO
 D. CuO
79. The acid employed for etching glass
 A. HF
 B. HCl
 C. HI
 D. HClO
80. Oil of vitriol is
 A. H₂SO₃
 B. H₂SO₄
 C. H₂SO₅
 D. H₂S₂O₈
81. The elements of group VA are generally known as
 A. normal element
 B. transition element
 C. halogens
 D. p-block elements
82. Which is manufactured by the electrolysis of aqueous sodium chloride?
 A. NaOH
 B. NaClO
 C. Na
 D. NaClO₃
83. Chain isomers differ in
 A. empirical formula
 B. molecular weight
 C. molecular formula
 D. length of carbon atom
84. The first organic compound was synthesized in the laboratory by
 A. Kekule
 B. Liebig
 C. Lavoisier
 D. Wohler
85. Ethylene can be prepared by dehydration of
 A. ethyl alcohol
 B. methyl alcohol
 C. acetic acid
 D. oxalic acid
86. The number of H⁺ -ion present in 500ml of 0.2M H₂SO₄ solution is
 A. 1.2×10²³
 B. 6.023×10²²
 C. 1.2×10²²
 D. 6.023×10²³
87. Which of this set of quantum number is not permitted?
 A. n=2, l=1, m=0
 B. n=2, l=0, m=-1
 C. n=3, l=0, m=0
 D. n=3, l=2, m=0

88. Which of this has an unpaired electron?
A. SO₂ B. CO
C. NO D. H₂O₂
89. Which of this have highest electron affinity value?
A. O B. S
C. Se D. Te
90. In the redox rxn, Cr₂O₇ + 14H⁺ + ne → 2Cr⁺³ + 7H₂O, the value of n is
A. 3 B. 4
C. 5 D. 6

SECTION: ENGLISH

Select the best alternatives:

[10 × 1 = 10]

91. The phonemic transcription of the word "indelible" is _____.
A. /indelɒbl/
C. indeli:b1/ B. /endelibl/
D. /i:ndelibl/
92. The word 'incurable' has its primary stress on the _____ syllable.
A. 1st B. 2nd
C. 3rd D. none of these
93. Ostentation is _____
A. pomp B. parade
C. display D. all of these
94. The antonym of 'novice' is a veteran
A. veteran B. disregard
C. profit D. retreat
95. I can carry _____ with the job even without your help.
A. out B. on
C. at D. upon
96. The enemy levelled the _____ the ground.
A. at B. upon
C. with D. on
97. We prevailed _____ him to come to the meeting.
A. at B. upon
C. on D. in
98. Lata is _____ in singing.
A. adapt B. adopt
C. adept D. adopted
99. They called him a traitor . He _____ a traitor.
A. is called B. was called
C. has been called D. was called to be
100. Would you mind _____ your car?
A. me moving B. my moving
C. to move D. none



Programmes offered at NCIT

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