Tribhuvan University
Institute of Science and Technology
4 Years Bachelor in Computer Science and Information Technology
Entrance Examination
Model set 3

Math

1. The range of relation R={(1,3),(2,5),(3, 7),(4,9)} is
   a. {1,2,3,4}
   b. {3,5,7,9}
   c. {1,5,7,3}
   d. {1,5,7,9}
2. If A = {1,2,3,4} then the relation on A x A where R = {(1,1),(1,2),(2,1)} is defined by
   a. {(x,y):y-2x}
   b. {(x,y):x+y=1}
   c. {(x,y):x+y<=3}
   d. {(x,y):x+y<=4}
3. The equation of straight line parallel to y-axis and passes through (2,3) is
   a. x=2
   b. x=3
   c. y=2
   d. x=-2
4. The equation x=0 represents
   a. the origin
   b. a line parallel to y-axis
   c. a line parallel to x-axis
   d. y-axis
5. Two vertices of a triangle are (5,9) and (-4,1) then the third vertex if the median meets at (1,1) is
   a. (3,-1)
   b. (4,2)
   c. (2,-7)
   d. (6,3)
6. If (3,3) lies in the line joining the points (h,0) and (0,k) then
   a. h+k=9
   b. 1/h + 1/k = ⅓
   c. hk=3
   d. 3h-3k=1
7. $lim_{x\to 0}\, xcosecx$ =
   a. 1
   b. ½
   c. -1
   d. 0
8. $\frac{lim_{x\to\theta}\, xcos\theta - \theta cosx}{x-\theta}$=
   a. cosθ + θsinθ
   b. sinθ - θcosθ
   c. cosθ - θsinθ
   d. θtanθ

9. Which of the following is null
   a. $\{x: x^2 - 2 = 0, xisirrational\}$
   b. $\{x: x^2 + x + x = 0, xisreal\}$
   c. the set of circles through three collinear points
   d. all of the above
10. The foot of perpendicular from $(\alpha, \beta, \gamma$on y-axis is
    a. $(\alpha, 0,0)$

b. $(0,\beta,0)$
c. $(0,0,\gamma$
d. (0,0,0)

11. $\frac{lim_{x\to\infty}\ 1+2+3+.....+n}{n^2}$=
a. ½
b. ¼
c. ⅓
d. ⅙

12. The equation whose roots are reciprocals of the equation a$x^3+bx^2+cx+d=0$ is
a. bx^3+cx^2+dx+c=0
b. dx^3+cx^2+bx+a=0
c. cx^3+dx^2+bx+a=0
d. dx^3-cx^2+bx-a=0

13. A = {x:2x+1=0 and x is an integer} then $A^{-1}$is a
a. disjoint set
b. power set
c. universal set
d. null set

14. The range of the function f(x) = e^x+1 is
a. R
b. R-{0}
c. (0,∞)
d. (-∞,0)

15. The direction cosines of the line joining the point A(-1,2,5) and B(-2,4,3) is
a. -⅓ ,⅔,-⅔
b. ¼ . -¾ , 1¾
c. -⅓ . -⅔ , ⅔
d. none

16. The number of real roots of the equation ax^2+b|x|+c=0 (a,b,c>0) are
a. 1
b. 2
c. 4
d. 0

17. If A, B , C are any sets then A-(B∪C) is equal to
a. (A-B)∪ $(A-C)$
b. $(A-B)\cap(A-C)$
c. $(A-B)\cup C$
d. $(A-B)\cap C$

18. If cosx = ½ and 0<x<360 , then the solutions are
a. x = 60,240
b. x=120,240
c. x=120,210
d. x=120,300

19. The projection of a line segment on the co-ordinate axes are 12,4,3 respectively then the length of the line segment is
a. 13
b. 14
c. 7
d. 8

20. A is symmetric as well as skew symmetric matrix then A is a
a. square matrix
b. scalar matrix

c. null matrix
d. identity matrix

21. The mapping of f:A→B is one to one if
a. f(A)=B
b. f(A)⊂B
c. f(x)=f(y)≠x=y
d. none

22. If $\text{cosec}^2 x = 2\cot x$ then the general value of x is equal to
a. $n\pi \pm \pi/4$
b. $n\pi + \pi/4$
c. $2n\pi \pm \pi/6$
d. $-1^{\,n}\,\pi/3 + n\pi$

23. The remainder when $(kx^2 + x + 1)$ is divided by (x+2k) is
a. -2k-1
b. k-1
c. $4k^3 + 2k$
d. $4k^3 - 2k - 1$

24. If a line lies in the octant OXYZ and makes equal angles with the axes then
a. $l = m = n = \pm 1/\sqrt{2}$
b. $l = m = n = \pm 1/\sqrt{3}$
c. $l = m = n = 1/\sqrt{3}$
d. $l = m = n = 1/3$

25. If the vertices of a triangle have integral co-ordinates then the triangle is
a. equilateral
b. never equilateral
c. isosceles
d. right angled

English

26. The word 'Moresque' has primary stress on the _____ syllable
a. 1st
b. 2nd
c. 3rd
d. none

27. Exacerbate is
a. vex
b. embitter
c. exasperate
d. all of these

28. The antonym for 'boisterous' is
a. justify
b. placid
c. descend
d. deny

29. Try to make ____ the meaning of this word
a. out
b. at
c. in

d. on

30. She pinned ____ the lost child
    a. on
    b. for
    c. at
    d. in
31. A wise man profits _____ the mistakes of others.
    a. with
    b. on
    c. by
    d. at
32. My _____ overlooks the garden
    a. room
    b. cabin
    c. apartment
    d. garden
33. She wants someone to help her. The correct passive voice is
    a. she wants herself to be helped
    b. she wants to be helped by someone
    c. she wants being helped by someone
    d. she wants to be helped
34. I still recall ____ her in those days.
    a. to meet
    b. meeting
    c. to meeting
    d. met
35. When he was class 10, he _____ football.
    a. was playing
    b. played
    c. playing
    d. had played
36. They became obliged ____ our favor.
    a. take
    b. to take
    c. to taking
    d. taking
37. Dick, along with his friends , _____ in the river.
    a. was sunk
    b. was drowned
    c. were sunk
    d. were drowned
38. If she had left her home early, she_____ here now.
    a. would have been
    b. would be
    c. may have reached
    d. can be
39. One should do ____ duty sincerely if one is a human being.
    a. his
    b. her
    c. one’s
    d. ones
40. The passive of “She let us go out “ is
    a. we are let go out
    b. we were let go out
    c. we were let to go out
    d. we were allowed to go out

41. Do you think this book is_____?
    a. worth of reading
    b. worthy reading
    c. worthy reading
    d. worth of seeing
42. Nothing but trees can be seen from my house , _____?
    a. can't they
    b. can they
    c. do they
    d. can it
43. Kareena and Kaeishma do not resemble _____ each other.
    a. to
    b. from
    c. with
    d. no preposition
44. How many syllables does the word 'headmaster' have?
    a. 1
    b. 2
    c. 3
    d. 4
45. The pair _____ has the same pronunciation.
    a. sun, son
    b. set, seat
    c. fool, full
    d. hut ,hat
46. It's time we ____ our lunch.
    a. had
    b. have
    c. should have
    d. will have
47. "Do as you are told" is a _____ sentence.
    a. simple
    b. complex
    c. compound
    d. optative
48. The antonym of 'latent' is
    a. hidden
    b. forbidding
    c. obvious
    d. artificial
49. If she had left her home early, she _____ here now.
    a. would have been
    b. would be
    c. may have reached
    d. can be
50. 'Is it going to rain?' It's incorrect answer is
    a. i don't hope so
    b. I hope not
    c. I don't suppose so
    d. I suppose not

Physics

51. At top of trajectory of a projectile, the direction of its velocity and acceleration are
    a. perpendicular to each other
    b. parallel to each other

c. anti-parallel to each other
d. inclined at angle of 45°

52. A body of mass m is taken from the surface of earth to a height equal to a height equal to radius of earth. The change in GPE is
a. 2MgR
b. MgR
c. MgR/2
d. MgR/4

53. The frequency of the sound of a car horn as percieved as an observer towards whom the car is moving increases due to
a. increase in wavelength
b. decrease in wavelength
c. increase in velocity
d. decrease in velocity

54. Two metal straps that constitute the thermostat must necessarily differ in their
a. mass
b. length
c. resistivity
d. coefficient of linear expansion

55. In Carnot engine, the temperature of the working substance at the end of the cycle is
a. equal to that at the beginning
b. less than that at the beginning
c. more than that at the beginning
d. depends on the amount of heat rejected to the sink

56. The critical angle of light passing from glass to air is minimum for
a. red
b. green
c. yellow
d. violet

57. During production of X-rays
a. conversion of KE to radiant energy
b. conservation of momentum
c. conservation of mass to energy
d. conservation of electric charge

58. On increasing the reverse bias to a large value in PN junction diode, current
a. increases slowly
b. remains fixed
c. suddenly increases
d. decreases slowly

59. A body is moving along a straight line by a machine delivering constant power. The distance moved by the body in time t is proportional to
a. $t^{1/3}$
b. $t^{3/4}$
c. $t^{3/2}$
d. t^2

60. A body is moving with constant speed v in a circle of radius r. Its angular acceleration is
a. vr
b. v/r
c. zero
d. v^2/r

61. Melting point of ice
a. increases with increased pressure
b. decreases with increased pressure

c. is independent of pressure
d. is proportional to pressure

62. The root mean square velocity of gas molecules of mass m at a given temp is proportional to
a. m^0
b. m
c. $m^{1/2}$
d. $m^{-1/2}$

63. To get three images of straight object, one should have two plane mirrors of angles
a. 60^o
b. 90^o
c. 120^o
d. 30^o

64. If T is reverberation time of an auditorium of volume v then
a. $T\alpha\, 1/V$
b. $T\alpha\, 1/\sqrt{2}$
c. $T\alpha V^2$
d. $T\alpha V$

65. The force between two short electric dipoles separated by a distance r varies as
a. r^2
b. r^4
c. r^{-2}
d. r^{-4}

66. The sensitivity of potentiometer can be increased by
a. increasing the emf of the cell
b. increasing length of potentiometer wire
c. decreasing the length of potentiometer wire
d. decreasing emf of battery of main current

67. A proton and an alpha particle are accelerated through same kinetic field. The ratio of their de-Broglie wavelength is
a. 1:1
b. $\sqrt{2}:1$
c. 2:1
d. 4:1

68. The minimum number of vectors of unequal magnitude required to produce a zero resultant is
a. 2
b. 3
c. 4
d. >4

69. An iron ball is heated. The percentage increase will be largest on
a. diameter
b. surface area
c. volume
d. density

70. Wavelength of laser beam can be used as standard for
a. time
b. temperature
c. angle
d. length

71. Velocity of waves in string depends upon
a. length of string
b. tension on string
c. density of surrounding medium
d. temperature of atmosphere

72. Two free parallel wires carrying current in opposite directions

a. attract each other
b. repel each other
c. rotate
d. neither attract nor repel

73. Value of relative permeability of diamagnetic substance is
a. 1
b. less than 1
c. more than 1
d. very large

74. Majority charge carrier in p-type semiconductor is
a. electrons
b. holes
c. both
d. none

Chemistry

75. Which one force is strongest?
a. gravitational
b. electromagnetic
c. nuclear
d. all have same magnitude

76. The weight of a molecule of $C_{60}H_{122}$ is
a. $1.4x10^{-21}$g
b. $5.025x10^{23}$g
c. $1.09x10^{-21}$g
d. $16.023x10^{23}$g

77. The equivalent weight of H_3PO_4 in reaction (P = 31)

$NaOH + H_3PO_4 \rightarrow NaH_2PO_4 + H_2O$

a. 59
b. 26
c. 98
d. 49

78. Energy of atomic orbitals in a shell is in the order
a. s<p<d<f
b. s>p>d>f
c. p<d<f<s
d. f>d>s>p

79. Which of the following halides is not oxidized by MnO_2
a. F
b. Cl
c. Br
d. I

80. The lightest metal is
a. Na
b. Hg
c. Ca
d. Li

81. Unit of Faraday is
a. ampere
b. C
c. $Cmol^{-2}$
d. $Csec^{-1}$

82. The density of neutrons is in the order
    a. $10^3 kgcm^{-3}$
    b. $10^6 kgcm^{-3}$
    c. $10^9 kgcm^{-3}$
    d. $10^{12} kgcm^{-3}$
83. Mark the element which gives $M^{-3} ion?$
    a. P
    b. N
    c. As
    d. Sn
84. Which of the following does not cause hardening of water
    a. $CaCl_2$
    b. $MgSO_4$
    c. Na_2SO_4
    d. $FeSO_4$
85. Which one of the following produces H_2S gas?
    a. $H_2 + S$
    b. $Sb_2S_3 + H_2$
    c. $FeS + H_2SO_4$
    d. all of above
86. Extremely hot copper wire reacts with steam to give
    a. CuO
    b. Cu_2O
    c. Cu_2O_2
    d. CuO_2
87. Spiegeleisen is an alloy of carbon containing
    a. Fe+Mn, 5-15%; C, 60%
    b. Fe+Mn, 60%; C 15%
    c. Fe+Mn, 25%; C, 60%
    d. Fe+Mn, 25%; C, 60%
88. First organic compound was synthesized in lab by
    a. Wohler
    b. Kekule
    c. Liebig
    d. Hannel

89. Which of the following is more volatile
    a. Carboxylic acid
    b. Benzene
    c. Benzoic acid
    d. Ethyl iodide
90. The IUPAC name of $CCl_3.CHOis$
    a. Trichloroacetaldehyde
    b. 1,1,1-trichloro acetaldehyde
    c. 2,2,2-trichloro ethanoyl chloride
    d. 2,2,2-Trichloro ethanal
91. Total number of compounds represented by the compound $CuSO_4.5H_2O$ is
    a. 27
    b. 21
    c. 5
    d. 8
92. The number of unpaired electrons in $3 + Cr$ ion is

a. 6
b. 4
c. 3
d. 1

93. Oxygen is in positive oxidation state in
a. H_2O_2
b. Cl_2O
c. F_2O
d. $NaOCl$

94. Which one of the following is a metalloid
a. C
b. Si
c. Ge
d. Pb

95. The unit of electrochemical equivalent is
a. gram
b. gram/ampere
c. gram/coulomb
d. coulomb/gram

96. The mass of neutron is of the order
a. $10^{-23}kg$
b. $10^{-24}kg$
c. $10^{-26}kg$
d. $10^{-27}kg$

97. Pure nitrogen is obtained from
a. $NH_3 + NaNO_2$
b. $NH_4Cl + NaNO_2$
c. N_2O + Cu
d. $NH_4{}_2Cr_2O_7$

98. Zeolites are used as
a. gem
b. ion exchanger
c. pigments
d. lubricant

99. Blister copper is
a. pure copper
b. alloy of copper
c. ore of copper
d. copper containing 1% impurity

100. Stainless steel contains
a. Fe+Cr+Ni
b. Fe+Ni+Cu
c. Fe+Cr+Cu
d. Fe+C+Ni

Answers

1.a	2. c	3.a	4. d	5. c	6. b	7. a	8.	9. d	10. b
11.	12.	13.	14. a	15.	16.	17.	18.	19.	20. c
21.	22.	23	24.	25.	26.	27. c	28. b	29.	30.
31.	32. a	33. b	34.	35. d	36.	37. b	38. a	39. c	40. d
41. d	42. d	43. c	44. c	45. a	46. c	47. a	48. c	49. a	50. b
51. a	52. a	53.	54. d	55.	56. d	57.	58. a	59. c	60. d
61. b	62. c	63. b	64. a	65.c	66. b	67.	68. a	69. b	70. a
71. b	72. b	73. b	74. b	75. b	76. a	77.	78. a	79. a	80. d
81. b	82. c	83. b	84. c	85. c	86. a	87. a	88. b	89. a	90. a
91. c	92. 1	93. c	94. c	95. c	96. d	97.	98. b	99. d	100. a