FAR WESTERN UNIVERSITY
Faculty of Science and Technology
Department of Computer Science and Information Technology

Model Question

Attempt all the questions. 1×100=100

MATHEMATICS

1. The value of $\lim_{x\to 0} \frac{1-\cos px}{1-\cos qx}$ is
   a. $\frac{q^2}{p^2}$ b. $\frac{p^2}{q^2}$ c. $-\frac{q^2}{p^2}$ d. $-\frac{p^2}{q^2}$

2. The derivative of sin x with respect to cos x is
   a. – cot x b. cos x c. tan x d. sin x

3. The function $f(x) = x^3 - 6x^2 + 3x + 18$ is strictly decreasing in
   a. (–8, 1) b. (1, 3) c. (3, 8) d. (1, 8)

4. Area bounded by x – axis and the curve $y = 3x$, $x = 0$, $x = y$ is
   a. 240 b. 260 c. 230 d. 250

5. The area of the circle $x^2 + y^2 = a^2$ is
   a. πa b. a^2 c. πa^2 d. $\pi a^2/2$

6. If 1, w, w^2 are the cube roots of unity, then
   a. $w^3 = 1$ b. $1 + w + w^2 = 0$ c. $w^2 = \bar{w}$ d. all of the above

7. The polar form of complex number is
   a. $r(\sin\theta + i\cos\theta)$ b. $r(\cos\theta + i\sin\theta)$ c. $r(\sin\theta - i\cos\theta)$ d. $r(\cos\theta - i\sin\theta)$

8. If the roots of the equation $ax^2 + bx + c = 0$ are in the ratio 2:3 then
   a. $6b^2 = 25ac$ b. $25b^2 - 6ac = 0$ c. $25b^2 + 6ac = 0$ d. $25ac + 6b^2 = 0$

9. The value of sin $(2\tan^{-1}x)$ is
   a. $\frac{1+x^2}{2x}$ b. $\frac{x}{1+x^2}$ c. $\frac{x}{1-x^2}$ d. $\frac{2x}{1+x^2}$

10. If sin x + 1 = 0, then x is equal to
    a. $(4n-1)\frac{\pi}{2}$ b. $(4n+1)\frac{\pi}{2}$ c. $(4n+1)\pi$ d. $(4n-1)\pi$

11. The value of x in 1 + 6 + 11 + 16 + …… + x = 148 is
    a. 8 b. 30 c. 36 d. 32

12. Sum to infinity of the series $1 + \frac{3}{2} + \frac{5}{4} + \frac{7}{8} + \cdots$ to ∞ is
    a. 2 b. 4 c. 8 d. 6

13. The value of $\begin{vmatrix} 1 & w & w^2 \\ w & w^2 & 1 \\ w^2 & 1 & w \end{vmatrix}$ is equal to

a. 0 b. w c. w^2 d. $-w$

14. The angle between the pair of lines $2x^2 + 5xy + 2y^2 = 0$ is

a. $\cos^{-1}(4/5)$ b. 0 c. $\pi/2$ d. $\tan^{-1}(4/5)$

15. The perpendicular length from point (2, 3) to the line $3x + 4y + k = 0$ is 6 units. The value of k is

a. 12 b. 36 c. 24 d. 48

16. The equation of the tangent to the circle $x^2 + y^2 = 4$ at (2, 1) is

a. $x + y = 4$ b. $x - y = 4$ c. $2x + y = 4$ d. $x + 2y = 4$

17. The value of $\lim_{x\to 0} \frac{1-2\cos^2 ax}{x^2}$ is

a. 0 b. a^2 c. $2a^2$ d. 2

18. If $(2x - 1, -3) = (3, y + 3)$ then

a. $x = 1, y = 0$ b. $x = -1, y = -3$ c. $x = 2, y = -6$ d. $x = 0, y = -1$

19. $\int x \sin x \, dx$ is equal to

a. $\sin x - x \cos x + c$ b. $\sin x + x \cos x + c$ c. $\cos x + x \sin x + c$ d. $-\sin x + x \cos x + c$

20. The value of $\lim_{\theta\to 0} \frac{\sin\theta}{\theta}$ is equal to

a. 1 b. 0 c. – 1 d. ∞

21. The value of $\lim_{n\to\infty} \frac{1^2+2^2+3^2+\cdots+n^2}{n^3}$ is equal to

a. $-\frac{1}{3}$ b. 0 c. – 1 d. $\frac{1}{3}$

22. The function $f(x) = 2x^3 - 6x^2 + 5$ is concave upward if

a. $x > 1$ b. $x = 1$ c. $x < 1$ d. $x < -1$

23. Integration of $\tan x$ with respect to x is

a. $\log|\sec x| + c$ b. $-\log|\cos x| + c$ c. both a and b d. none

24. $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \sin^2 x dx$ is equal to

a. $\frac{\pi}{2}$ b. $-\frac{\pi}{2}$ c. π d. $-\pi$

25. The sum of first hundred even numbers is

a. 9702 b. 10100 c.12100 d.11100

26. For what value of k the equation $x^2 - kxy + y^2 + 2y + 2 = 0$ represents a pair of straight lines?

a. $\pm\sqrt{2}$ b. $\frac{\sqrt{2}}{3}$ c. $\frac{\sqrt{3}}{2}$ d. $-\sqrt{3}$

27. Two lines represented by the equation $9x^2 + 24x - 16y^2 = 0$ are
a. perpendicular b. coincident c. parallel d. none

28. The angle between the two lines given by the equation $4x^2 - 4y^2 = 0$ is
a. 75^0 b. 45^0 c. 90^0 d. 120^0

29. The length of the tangent drawn from the point (2, 5) to the circle $x^2 + y^2 - 2x - 3y - 1 = 0$ is
a. $\sqrt{26}$ b. 26 c. 13 d. $\sqrt{13}$

30. If $f(x) = \sqrt{4 - x^2}$ then $f(2)$ is
a. 0 b. 4 c. 2 d. – 2

PHYSICS

31. The energy (E) radiated per unit area per second by a black body at temperature (T) is given by $E = \sigma T^4$where σ is Stefan's constant. The dimension of σ is
a. $MT^{-2}K^{-2}$ b. $MT^{-3}K^{-4}$ c. MT^3K^{-4} d. $ML^2T^{-3}K^{-4}$

32. If two vectors each having magnitude P is acting at a point and angle between them is θ, then resultant is given by
a.$\sqrt{2}P\cos\frac{\theta}{2}$ b.$2P\cos\frac{\theta}{2}$ c.$\sqrt{2}P\sin\frac{\theta}{2}$ d.$\sqrt{2p\cos\frac{\theta}{2}}$

33. A ball is released from the top of a tower of height H. It takes T seconds to reach ground. What is the time required to reach half of tower (H/2)
a. $\frac{T}{2}$ b. $\sqrt{T}$ c. $\sqrt{2}T$ d. $\frac{T}{\sqrt{2}}$

34. Inertia of a body depends upon
a. velocity b. mass c. area d. length

35. A bomb of 12 kg explodes into two pieces of masses 4 kg and 8 kg. The velocity of 8 kg mass is 6m/s, the kinetic energy of other mass is
a. 148 J b. 232 J c. 124 J d.288 J

36. By what angle should a cyclist has to incline so that he can move in a circle of radius r with speed v
a. $\sin^{-1}\frac{v^2}{rg}$ b.$\cot^{-1}\frac{v}{rg}$ c.$\tan^{-1}\frac{v^2}{rg}$ d.$\tan^{-1}\frac{v}{rg}$

37. Acceleration due to gravity is not affected by moving
a. towards pole b. along equator c. above the surface of earth d. below the surface of earth

38. Two circular rings have their masses in the ratio 1:2 and their radius are in the ratio 3:1. The ratio of their moment of inertia is
a. 1:3 b. 3:2 c. 9:2 d. 9:4

39. Time period of a simple pendulum is doubled, when
    a. its length is doubled
    b. mass of the bob is doubled
    c. length is made four time
    d. amplitude is halved

40. Two wires of same materials and cross-sections are stretched by same force, if their lengths are in the ratio 1:3, ratio of their elongation is
    a. 3:1 b.1:3 c. 9:1 d. 1:9

41. Kinetic energy of particle, in simple harmonic motion, is maximum when it is
    a. at extreme position
    b.midway between mean and extreme position
    c.at mean position
    d. kinetic energy remains constant throughout the motion

42. Surface tension of liquid with increase of temperature
    a. increase b. decrease c. remains constant d. none of above

43. Viscosity is the property of
    a. liquid only b. solid only c. gasses only d. liquid and gasses both

44. Two bodies will be in thermal equilibrium if they have same
    a. specific heats b. heat energy c. temperature d. thermal conductivity

45. When water is heated from 0℃ to 15℃, its volume
    a. increase
    b. decrease
    c. first increases and then decreases
    d. first decreases then increases

46. A person approaches a plane mirror with velocity v then the relative of approach of person and his image is
    a. zero b. v c. 2v d. v/2

47. The refractive index of diamond is 2.4, velocity of light in diamond is
    a. 1.25×10^8 b. 3×10^8 c. 2.5×10^8 d. 2×10^8

48. If the earth is supposed to be metallic sphere of radius 6400 km. What is its capacitance?
    a. $711\mu F$ b.$811\mu F$ c.$711F$ d.$711pF$

49. An electron of charge e in rest in an electric field between two plates separated by a distance d and with potential difference v then force experienced by it is
    a. $\frac{ev}{d}$ b. $\frac{ed}{v}$ c.$\frac{d}{ev}$ d. $\frac{v}{d}$

50. A uniform wire of resistance 50 Ω is cut into 5 equal parts. These parts are now connected in parallel. The equivalent resistance of the combination is
    a. 2 Ω b. 10Ω c.250 Ω d.6250 Ω

51. A vertical wire carries a current in upward direction. An electron beam sent horizontally towards the wire will be deflected
    a. towards right b. towards left c. upwards d. downwards

52. The mean square speed of the molecules of a gas at absolute temperature T is proportional to
    a. $\frac{1}{T}$ b. $\sqrt{T}$ c. T d. T^2

53. A bar magnet is released from rest along the axis of a very long, vertical copper tube. After sometime the magnet
    a. will stop in tube b. will move with almost constant speed
    c. will move with an acceleration g d. will oscillate

54. A capacitor acts as an infinite resistance for
    a. DC b. AC c. DC as well as AC d. neither AC nor DC

55. Cathode rays constitute a stream of
    a. protons b. electrons c. positive ions d. negative ions

56. If the frequency of light in a photoelectric experiment is doubled, the stopping potential will
    a. be doubled b. be halved c. becomes more than double d. become less than double

57. Electric conduction in a semiconductor take place due to
    a. electron only b. holes only c. both electrons and holes d. neither electrons nor holes

58. Velocity of sound in air is 332 m/s. Its velocity in vacuum will be
    a. greater than 332 m/s b. less than 332 m/s c. equal to 332 m/s d. meaningless.

59. When a drop of oil is spread on a water surface, it displays beautiful colors in daylight because of
    a. dispersion of light b. reflection of light c. polarization of light d. interference of light

60. An X-ray tube is operated at 50 KV. The minimum wavelength produced is
    a. 0.5 Å b. 0.75 Å c. 0.25 Å d.1 Å

ENGLISH

61. Find the correctly spelt word.
    a. entereprenuer b. enterpreneur c. entirepreneur d. entrepreneur

62. "Creature having both male and female organs" means
    a. hermaphrodite b. homosexual c. masochist d. sodomite

63. Choose the synonym for the bold faced word: He did not succeed in his endeavour.
a. enterprise b. effort c. trick d. plan

64. Ram told Shyam that Hari would leave for his native place ……
a. the next day b. tomorrow c. yesterday d. today

65. There are ……views on the issue of giving bonus to the employees.
a. independent b. modest c. divergent d. adverse

66. Choose the correct option for the underlined idiom: Wait here, I shall be back *in a jiffy*.
a. in a hurry b. by some vehicle c. at once d. after some time

67. Identify the antonym for the bold faced word in the given sentence: There is an obscure cave on the other side of the hill.
a. admired b. notorious c. infamous d. well-known

68. They will not be …… to run away by us.
a. allow b. allowed c. allowing d. allows

69. Our sir teaches Mathematics . . . . . English.
a. across b. beside c. besides d. both

70. The word "scientific" has the stress on ..... syllable.
a. first b. second c. third d. fourth

71. The word "farce" has the same vowel sound as the word .....
a. scarce b. rash c. marsh d. fix

72. I wish I ..... solve the exercise.
a. can b. will c. would d. could

73. A period of ten years is called .....
a. century b. decade c. millennia d. jubilee

74. Select the right synonym to the word "several".
a. numerous b. diminutive c. limited d. scarce

75. Give the antonym of "witty".
a. clever b. smart c. fool d. scruffy

76. He ventured ..... small scale business.
a.from b. off c. into d. on

77. What .....the have you been up to?
a. until b. for c. on d. to

78. If you …… a lot, you get cancer.
a. smoke b. smoked c. will smoke d. can smoke

79. She …… to return home if the war didn't end.
a. decided b. had decided c. has decided d. will decide

80. Choose the correct word from given options: Honesty …… the best policy.
a.are b. has c. is d. am

COMPUTER SCIENCE

81. A ……gate give orutput as 1only if input signals are all 1's.
a. OR b. AND c. XOR d. NAND

82. The boolean expression for XOR gate for two variable X and Y is
a. X'Y+XY' b. XY'+X'Y' c. X'Y'+XY d. XY+YX

83. The simplification form of boolean expression AB(B+C) is
a. AB b. AC c. A+C d. A'B

84. MS Word is example of
a. system software b. application software c. input device d. processing device

85. Junk e-mail is also called
a. spoof b. spool c. spam d. draft

86. A …..software is used to view web pages.
a. browser b. search engine c. MS- Excel d. all of the above

87. Which of the following is not social media network?
a. instagram b. facebook c. twitter d. opera

88. The 1GB data storage means…..
a. 1024 KB b. 1024 MB c. 1024 TB d. 1024 bits

89. The energy gap between the conduction band and the valence band of certain material is 0.7eV. The material is
a. an insulator b. phosphorus c. semi-conductor d. semimetal

90. The binary equivalent of decimal number 11 is
a. 1010 b. 1011 c. 1001 d. 1100

91. The binary addition of 1001+0011 is
a. 1100 b. 1010 c. 1001 d. 1110

92. Computer virus is ….
a. language b. bacteria c. hardware d. software

93. The first computer introduced in Nepal was
a. IBM 1401 b. IBM 1402 c. IBM 1400 d. IBM 1405

94. Which of the following is not ISP in Nepal?
a. NTC b. Mercantile c. Dish home d. Nabil

95. …. cannot be used in MS Office.
a. joystick b. mouse c. keyboard d. scanner

96. How do you display current date in MS Excel?
a.today() b. date() c. time() d. now()

97. In the formula, which symbol specifies the fixed columns or rows?
a. # b. $ c. & d. %

98. Which of the following methods cannot be used to enter data in a cell
a. pressing an arrow key b. pressing the tab key
c. pressing the Esc key d. clicking on the formula bar

99. Computer is free from tiresome and boardroom. We call it
a. accuracy b. reliability c. diligence d. versatility

100. Properly arranged data is called
a. field b. words c. information d. file