FAR WESTERN UNIVERSITY
Faculty of Science and Technology
Department of Computer Science and Information Technology
Entrance Examination B. Sc. CSIT 2082
Time: 2Hrs

Attempt all the questions. 1×100=100

Mathematics

1. The negation of "some students are intelligent " is
   a. No student is intelligent b. All students are intelligent
   c. Some students are not intelligent d. Not All students are intelligent

2. The set of intelligent students in a class is
   a. Empty set b. singleton set c. a finite set d. not a well-defined set

3. If n(U) = 125, n(A) =80 and n(B) = 65, then the greatest value of n(A∪B) is
   a. 125 b. 80 c. 100 d. 110

4. For any real number x, $|x|$is
   a. x b. –x c. min{ x, -x} d. max{ x, -x}

5. The value of $\log_2 7$ is
   a. An integer b. a rational number c. an irrational number d. prime number

6. The domain of the function $y = x^2 + 5x + 6$ is
   a. $(-\infty, \infty)$ b. $(0, \infty)$ c. (-2, -3) d. none

7. Let f and g are the two functions defined by $f(x) = \frac{x}{x+1}$ and $g(x) = \frac{x}{1-x}$ then fog is
   a. $\frac{1}{x}$ b. $\frac{1}{x-1}$ c. x-1 d. x

8. The period of sinx + tanx is
   a. π b. 2π c. $\pi/2$ d. 0

9. The sum of 40 AM's between two numbers is 120. The sum of 50 AM's between two numbers is
   a. 160 b. 150 c. 140 d. 130

10. If a, b, c and d are in H.P. then
    a. ac > bd b. ad > bc c. ad < bc d. ac < bd

11. For a matrix A, $A^2 = \begin{bmatrix} 4 & 0 \\ 0 & 4 \end{bmatrix}$ then A is equal to
    a. 2I b. -2I c. $\pm 2I$ d. 3I

12. From the matrix equation AB = AC we conclude that B =C provided
    a. A is singular b. A is nonsingular c. A is symmetric d. A is square

13. If $\begin{vmatrix} 6i & 3i & 1 \\ 4 & 3i & -1 \\ 20 & 3 & i \end{vmatrix}$ = x+iy then
    a. x = 0, y = 0 b. x = 0, y = 3 c. x = 1, y = 3 d. x = 3, y = 1

14. The polar form of 1- i is
    a. $\sqrt{2}$ (cos 315° + i sin 315°) b. $\sqrt{2}$ (cos 45° + i sin 45°)
    c. $\sqrt{2}$ (cos 135° + i sin 135°) d. $\sqrt{2}$ (cos 225° + i sin 225°)

15. In a ΔABC if a = 4, b =8 and <C = 60^0 then
    a. c = $4\sqrt{3}$ b. <B = 90^o c. <A = 30^o d. all of the above

16. The circumcenter of the of a right-angled triangle with vertices A(3,0), B(0, 4) and C(0, 0) is
    a. (0, 0) b. (1, 2) c. (3, 2) d. (3/2, 2)

17. Which of the followings represent a vector?
    a. a straight line b. a line segment c. a directed line segment d. none

18. The angle between the vector $\vec{\imath} + 2\vec{j} + 3\vec{k}$ and y-axis is
    a. $\frac{3\pi}{4}$ b. $\cos^{-1}\frac{2}{\sqrt{5}}$ c. $\cos^{-1}\frac{2}{\sqrt{14}}$ d. $\cos^{-1}\frac{2}{\sqrt{8}}$

19. A person has 3 children. That probability that all three are boys is
    a. 0 b. 1 c. ¼ d. 1/8

20. The derivative of log(sinx) is
    a. cosecx b. cotx c. tanx d. secx

21. Which of the followings is the discontinuity of the function f(x) = $\frac{x-2}{x^2-1}$?
    a. 2 b. -1 c. 1 d. both b and c

22. The absolute maxima and minima of the function f(x) =4x - $\frac{x^2}{2}$ in the interval $\left[-2,\frac{9}{2}\right]$ are
    a. 4,-2 b. 9,0 c. 8,-10 d. 12,-3

23. If y = $\tan^{-1}$x then $\frac{dy}{dx}$ is
    a. $1+x^2$ b. $1-x^2$ c. $\frac{1}{1-x^2}$ d. $\frac{1}{1+x^2}$

24. The value of $\lim_{x\to\pi/2}\frac{sec3x}{secx}$ is
    a. $\frac{-1}{3}$ b. $\frac{1}{3}$ c. $\frac{-1}{9}$ d. $\frac{1}{9}$

25. The velocity of the particle at t = 5sec when its distance from a fixed point is $t^3 - t^2 + 7$ is
    a. 65m/sec b. 60m/sec c. 75 m/sec d. 75m/sec

26. The value of $\int\frac{1}{\sqrt{a^2-x^2}}dx$ is
    a. $\sin^{-1}$ x +C b. $\sec^{-1}$x +C c. $\sin^{-1}$x/a +C d. $\sec^{-1}$ x/a +C

27. Which of the following equation is homogeneous differential equation?
    a. $xdy + y^2dx = 2$ b. $x^2dx + y^2dy = 0$ c. $x^2dx + y^2dy = 3$ d. sinxdx + dy =0

28. The degree of the differential equation $\left(\frac{d^2y}{dx^2}\right)^3 + 2\left(\frac{dy}{dx}\right)^2 + 3\frac{dy}{dx} = 0$ is
    a. 1 b. 2 c. 3 d. 0

29. The area bounded by the curve $y = 4x^2$ and the ordinates at x =0 and x=1 is
    a. 4/3 b. 2/3 c. ¾ d. 3/2

30. The property of cube root of unity where ω is the cube root of unity is
    a. $1+\omega+\omega^2=0$ b. $1+\omega^2=0$ c. $\omega=-\omega^2$ d. $\omega+\omega^2=1$

Physics

31. The frequency of second overtone in closed pipe is:
    a. 2f b. 3f c. 5f d. 4f

32. Dimension of angular momentum is:
a. MLT^{-2} b. ML^2T^{-1} c. ML^2T^{-2} d. MLT^{-1}

33. Which of the following is the vector quantity:
a. Speed b. mass c. work d. momentum

34. A particle is projected at an angle θ with velocity v. The ratio of maximum height to horizontal range:
a. $\frac{\tan\theta}{4}$ b. $\frac{\tan\theta}{2}$ c. $\frac{\sin\theta}{\cos\theta}$ d. $\tan\theta$

35. Escape velocity of earth is 11.2 km/s. If earth's radius is doubled keeping mass same, escape velocity becomes:
a. Half b. Double c. Same d. $\frac{1}{\sqrt{2}}\ times$

36. Quality of sound depends on:
a. Frequency b. Amplitude c. Waveform d. Velocity

37. If heat is supplied at constant volume, work done is:
a. Maximum b. Zero c. Minimum positive d. Negative

38. Unit of resistivity is:
a. Ohm b. Ohm/m c. Ohm m d. Ohm/m^2

39. Gauss law is applicable to:
a. Symmetric charges distribution b. Any charge
c. Infinite charges only d. Point charges only

40. Work done to move a charge in electric field depends on:
a. Path b. Potential difference c. Speed d. Charge sign

41. Two masses, m and 2m, are dropped from the same height. Neglecting air resistance. The ratio of times taken to reach the ground is:
a. 1 : 2 b. 1 : 1 c. 2 : 1 d. 4 : 1

42. Power delivered by a force is given by:
a. $\vec{F}.\vec{s}$ b. $m.\vec{a}$ c. $\vec{F}.\vec{a}$ d. $\vec{F}.\vec{v}$

43. Force on moving charge in magnetic field is maximum when angle with B is:
a. 0° b. 180° c. 270° d. 360°

44. SI unit of magnetic flux density is:
a. Tesla b. Weber c. Gauss d. Henry

45. A galvanometer is converted into an ammeter by connecting:
a. High resistance in series b. Low resistance in parallel
c. High resistance in parallel d. Battery in series

46. Critical angle $'c'$ is related to refractive index $'n'$ by:
a. $\cos c = \frac{1}{n}$ b. $\tan c = n$ c. $\tan c = \frac{1}{n}$ d. $\sin c = \frac{1}{n}$

47. A horizontal pipe carries water with speed 2 m/s at pressure $2 \times 10^5\ Pa$. The pipe narrows so that water speed increases to 5 m/s. Find the pressure in the narrow section. (Density of water is 1000 kg/m^3)
a. $1.5 \times 10^5\ Pa$ b. $1.7 \times 10^5\ Pa$ c. $1.9 \times 10^5\ Pa$ d. $2.2 \times 10^5\ Pa$

48. A 2 μF and 1 μF capacitor in series across 9 V. Charge on each (in μC) equals:
a. 6 μC b. 18 μC c. 9 μC d. 27 μC

49. A radioactive sample's activity drops to 1/16 in time t. The number of half-lives elapsed is:
a. 4 b. 6 c. 8 d. 10

50. An inductor of 0.5 H is connected to 100 V, 50 Hz AC. Inductive resistance is:
a. 157 Ω b. 314 Ω c. 78.5 Ω d. 100 Ω

51. A long straight wire carries a current I. The magnetic field at a distance r is B. If both the current and the distance are doubled, the new magnetic field becomes:
a. $B/2$ b. B c. $2B$ d. $B/4$

52. The output of a NOT gate for input 1 is:
a. Depends on circuit b. 1 c. infinite d. 0

53. The half life of a substance is 20 min. Its decay constant is:
a. 0.0347 min^{-1} b. 0.693 min^{-1} c. 0.05 min^{-1} d. 3.47 min^{-1}

54. In an intrinsic semiconductor, the number of electron is:
a. Greater than hole b) Less than hole c. Equal to holes d. Zero

55. For de Broglie wavelength, the kinetic energy of particle is proportional to:
a. λ b. $\frac{1}{\lambda}$ c. $\frac{1}{\lambda^2}$ d. λ^2

56. The effective resistance between two diagonally opposite corners of a square made of four equal resistors (R each) is:
a. R b) $\frac{R}{2}$ c. $2R$ d. $\frac{R}{\sqrt{2}}$

57. A rod 0.5 m long moves perpendicular to B = 0.2 T with velocity 10 m/s. Induced emf across its ends is:
a. 1 V b. 0.5 V c. 2 V d. 10 V

58. A series LCR circuit is at resonance at angular frequency $\omega_\circ$. If the inductance L is doubled and the capacitance C is halved, the new resonant frequency becomes:
a. $\frac{\omega_\circ}{2}$ b. $\frac{\omega_\circ}{\sqrt{2}}$ c. $\omega_\circ$ d. $2\omega_\circ$

59. A metal work function is 1 eV. Monochromatic light of wavelength 310 nm is incident on the plate. Stopping potentials in volts is:
a. 3V b. 1 v c. 0.5 V d. 2 V

60. Two bodies each 1 kg collide elastically. One at 4 m/s, the other at rest. Speed after collision:
a. 2 m/s and 2 m/s b. 0 m/s and 4 m/s c. 1 m/s and 3 m/s d. 4 m/s and 0 m/s

English

61. I usually _____ to school by bus.
a. am going b. go c. goes d. going

62. They _____ lived here since 2010.
a. have b. has c. had d. having

63. Identify the subordinate clause in this sentence: **I know that you are honest.**
a. I know b. you are honest c. that you are honest d. know that

64. A simple sentence contains:
a. Two independent clauses b. One independent clause only
c. One main and one subordinate clause d. No verb

65. I wish I …… studied harder last year.

a. will b. can c. have d. had

66. You _____ wear a helmet when riding a bike.
a. may b. might c. must d. can't

67. He avoided _____ the question.
a. answering b. to answer c. answer d. answered

68. Which marker indicates cause and effect?
a. Although b. Therefore c. But d. While

69. He _____ working here since 2015.
a. is b. will be c. was d. has been

70. Neither of the options _____ good.
a. are b. is c. were d. be

71. The reported speech of: **"I cannot swim," she said.**
a. She said she could not swim. b. She said she cannot swim.
c. She said can not swim. d. She said she can swim.

72. Change to passive: **They are building a new bridge.**
a. A new bridge was built. b. A new bridge is built.
c. A new bridge is being built. d. A new bridge builds.

73. If you _____ ice, it melts.
a. heat b. heating c. heated d. will heat

74. They have finished, _____?
a. have they b. haven't they c. did they d. do they

75. He failed the test _____ he studied hard.
a. but b. because c. so d. although

76. Transform into complex sentence: **He failed. He didn't study.**
a. He failed because he didn't study. b. He failed and he didn't study.
c) He failed but he didn't study. d. He failed or he didn't study.

77. Correct the sentence: **Lets eat grandma!**
a. Let's eat grandma! b. Lets eat, grandma!
c. Let's eat, grandma! d. Let's eat grandma.

78. Identify the type of adverb: **"She smiled happily."**
a. Adverb of time b. Adverb of place c. Adverb of manner d. Adverb of frequency

79. Choose the sentence that uses the adjective incorrectly:
a. That is an interesting book. b. He is more stronger than before.
c. The cake tastes delicious. d. It was a sunny day

80. Which of these is a preposition?
a. Quickly b. Beautiful c. However d. Between

Computer Science

81. Which of the following is the brain of the computer?
a. Central Processing Unit b. Memory
c. Arithmetic and Logic unit d. Control unit

82. Which of the following computer language is written in binary codes only?
a. pascal b. machine language c. C d. C#

83. Which of the following is the smallest unit of data in a computer?
a. Bit b. KB c. Nibble d. Byte

84. Which of the following is not a type of computer code?
a. EDIC b. ASCII c. BCD d. EBCDIC

85. Which of the following is used in EBCDIC?
a. Super Computers b. Mainframes c. Machine Codes d. Programming

86. Which of the following storage is a system where a robotic arm will connect or disconnect off-line mass storage media according to the computer operating system demands?
a. Magnetic b. Secondary c. Virtual d. Tertiary

87. Which of the following can access the server?
a. Web Client b. User c. Web Browserd. Web Server

88. Which of the following is created when a user opens an account in the computer system?
a. SFD b. MFD c. Subdirectory d. RFD

89. Which of the following type of computer is mostly used for automatic operations?
a. analog b. digital c. hybrid d. remote

90. Which of the following is the first neural network computer?
a. AN b. AM c. RFD d. SNARC

91. When a key is pressed on keyboard, which standard is used for converting the keystroke into the corresponding bits?
a. ANSI b. ASCII c. EBCDIC d. ISO

92. Which of these output devices are used for the translation of information from any computer into a pictorial form on the papers?
a. Card punch b. Touch panel c. Plotter d. Mouse

93. What is the function of the Control Panel in Windows?
a. To access web browsers b. To change settings and control system configurations
c. To edit documents d. To play media files

94. What does SSD stand for?
a. Solid State Drive b. Standard Storage Disk
c. Static State Disk d. Solid Storage Drive

95. Which of the following keys is used to enter the BIOS setup when starting a computer?
a. Esc b. F2 c. F8 d. F10

96. Which key combination is used to force quit an application in Windows?
a. Ctrl + Alt + Delete b. Ctrl + Shift + Esc c. Ctrl + F4 d. Alt + F4

97. The first generation of computers used which technology?
a. Transistors b. Vacuum tubes c. Integrated circuits d. Microprocessors

98. What is phishing?
a. A method of securing data b. A type of computer virus
c. A fraudulent attempt to obtain sensitive information d. A network protocol

99. Which of the following does not represent a programming paradigm?
a. Object-Oriented b. Procedural c. Relational d. Functional

100. The term used to refer to horizontal page orientation–
a. portrait b. alignment c. table d. landscape

GOOD LUCK