FAR WESTERN UNIVERSITY
Faculty of Science and Technology
Re-Entrance Examination B. Sc. CSIT 2081
Time: 2Hrs

Attempt all the questions. 1×100=100

Mathematics

1. If ${}^nP_2 = 30$ then n = ?
   a. 5 b. 6 c. 4 d. 3

2. In how many ways 11 players can be selected out of 15 players if one particular person is never included
   a. 362 b. 364 c. 360 d. 354

3. In the expansion of $(1+x)^{50}$ the sum of coefficients of odd power of x is
   a. 0 b. 2^{49} c. 2^{50} d. 2^{25}

4. In ΔABC, b cosC + c cosB is equal to
   a. bc b. b c. c d. a

5. In ΔABC, if A = 30^0, B = 45^0 and b =4 then c = ?
   a. $\sqrt{3}+1$ b. $\sqrt{3}-1$ c. $\sqrt{6}$ d. None

6. The eccentricity of the parabola $x^2 - 4x + 4y + 1 = 0$ is
   a. $\frac{1}{2}$ b. $\frac{1}{4}$ c. 0 d. 1

7. The foci of the hyperbola $2x^2 - 3y^2 = 5$ is
   a. $\left(\pm\frac{5}{\sqrt{6}}, 0\right)$ b. $\left(\pm\frac{4}{\sqrt{6}}, 0\right)$ c. $\left(\pm\frac{5}{8}, 0\right)$ d. (2, -3)

8. The area of the parallelogram whose diagonals are represented by $\vec{a}$ and $\vec{b}$ is
   a. $\vec{a}\times\vec{b}$ b. $|\vec{a}\times\vec{b}|$ c. $\frac{1}{2}|\vec{a}\times\vec{b}|$ d. $\vec{a}.\vec{b}$

9. If P(A) = 0.50 , P(B) = 0.75 and P(A∩ B) = 0.40 then P(B/A) is
   a. $\frac{8}{15}$ b. $\frac{6}{5}$ c. $\frac{4}{15}$ d. $\frac{4}{5}$

10. The correlation coefficients between two variables is 1 then there is a
    a. Positively perfect correlation b. Negatively perfect correlation
    c. No correlation d. None of these

11. $\lim_{x\to 0} \frac{x-sinx}{x^3}$ = ……..

a. $\frac{1}{5}$ b. $\frac{2}{5}$ c. $\frac{1}{6}$ d. $\frac{2}{3}$

12. The tangent to a given curve is perpendicular to x-axis if

a. $\frac{dy}{dx}$ =0 b. $\frac{dy}{dx}$ =1 c. $\frac{dx}{dy}$ =0 d. $\frac{dx}{dy}$ =1

13. The value of $\int \frac{dx}{\sqrt{9-4x^2}}$ is

a. $\frac{1}{2}\sin^{-1}\frac{2x}{3}$ + C b. $\sin^{-1}\frac{2x}{3}$ + C c. $\frac{1}{2}\tan^{-1}\frac{2x}{3}$ + C d. $\tan^{-1}\frac{2x}{3}$ + C

14. The solution of the linear differential equation $\frac{dy}{dx} + \frac{y}{x} = x^2$ is

a. $xy = x^4 + C$ b. $xy = \frac{x^4}{4}$ +C c. $y = x^4$ +c d. xy = C

15. The rate of change of volume of sphere is equal to the rate of change of its radius then its radius is

a. $\frac{1}{2\pi}$ b. $\frac{1}{2\sqrt{\pi}}$ c. $\frac{1}{\sqrt{2}}$ d. 1

16. The negation of the statement " if p then q " is

a. p and not q b. not p and q c. not q implies p d. not p implies q

17. Which of the following is equal to A – B

a. $\overline{A} \cap \overline{B}$ b. $A \cap \overline{B}$ c. $\bar{A} \cap B$ d. $\bar{A} - \bar{B}$

18. Which of the following is an even function

a. sinx b. tanx c. cosx d. $x^2 + x$

19. If f and g are one to one and onto functions then gof is

a. one to one and onto b. one to one c. onto d. into

20. If a, b, c are in H.P. then

a. ac < bd b. ad > bc c. ab > cd d. ab < cd

21. If A is square matrix then $A + A^T$ is

a. diagonal matrix b. scalar matrix c. skew-symmetric matrix d. symmetric matrix

22. If $A = \begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix}$ then correct statement is

a. $A^2 – 5A + 7I = 0$ b. $A^2 + 5A + 7I = 0$ c. $A^2 – 5A - 7I = 0$ d. $A^2 + 5A - 7I = 0$

23. The quadratic equation $ax^2 + 2x + 1 = 0$ has one double root if

a. a =0 b. a = -1 c. a = 1 d. None

24. If both roots of $x^2 + bx + c = 0$ and $x^2 + dx + e = 0$ are common then
a. bc = de b. bd = ce c. $b^2c = d^2e$ d. be = cd

25. If ω is the imaginary cube root of unity then ω^{31} is
a. ω b. ω^2 c. 1 d. 0

26. The distance of the complex number $1 + i$ from the origin is
a. 1 b. 2 c. $\frac{1}{\sqrt{2}}$ d. $\sqrt{2}$

27. The value of $\cos^{-1}(\cos(\frac{5\pi}{4}))$ is
a. $\frac{5\pi}{4}$ b. $\frac{3\pi}{4}$ c. $-\frac{\pi}{4}$ d. $\frac{\pi}{4}$

28. If $7\sin^2x + 3\cos^2x = 4$ then the general solution is
a. $n\pi \pm \frac{\pi}{6}$ b. $n\pi \pm \frac{\pi}{3}$ c. $n\pi \pm \frac{\pi}{4}$ d. $n\pi \pm \frac{\pi}{2}$

29. For any positive integer n, $7^n - 2^n$ is divisible by
a. 3 b. 4 c. 5 d. 7

30. If the system of linear equations has infinite solutions then it is called
a. independent and consistent b. independent and inconsistent
c. dependent and consistent d. dependent and inconsistent

Physics

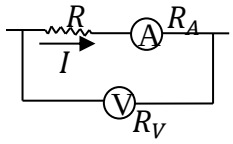
31. A quantity of ideal gas undergoes an expansion that increase its volume from V_1 to $V_2 (= 2V_1)$. The final pressure of the gas is P_2. Does the gas do more work on its surrounding if the expansion is at constant pressure or at constant temperature?
a. at constant pressure b. at constant temperature
c. the same amount of work is done in both cases d. not enough information is given to decide

32. A negative point charge moves along a circular orbit around a stationary positive point charge. Which aspect of the electric force on the negative point charge will remain constant as it moves?
a. magnitude b. direction
c. both magnitude and direction d. neither magnitude nor direction

33. A capacitor has vacuum in the space between the conductors. If you double the amount of charge on each conductor, what happens to the capacitance?

a. it increases
b. it decreases
c. it remain the same
d. the answer depend on the shape and size of the conductors

34. Suppose we want to measure an unknown resistance R using the circuit shown in figure below. The meter resistance are $R_V = 10{,}000\ \Omega$ (for voltmeter) and $R_A = 2\ \Omega$ (for ammeter). If the voltmeter reads $12\ V$ and the ammeter reads $0.1\ A$, what is the resistance R of resistor?



a. 120 Ω b. 118 Ω c. 100 Ω d. 98 Ω

35. What magnetic field strength is required for electrons to move in circular paths with frequency$f = \frac{800}{\pi}\ MHz$?

a. $9.1 \times 10^{-9} T$ b. $9.1 \times 10^{-3}\ T$ c. $9.1 \times 10^{9}\ T$ d. $9.1 \times 10^{3}\ T$

36. If two protons are traveling parallel to each other in the same direction and at the same speed, what is the nature of magnetic force between them?

a. attractive b. repulsive c. do not experience any force d. none of the above

37. In photoelectric effect if the intensity of light is increased by three times, then maximum kinetic energy of photoelectrons will become

a. three times b. nine times c. remain same d. one third

38. A transverse wave travels along the Z-axis. The particles of the medium must move

a. along the Z-axis b. along the Y-axis c. along the X-axis d. in the X-Y plane

39. A sine wave is travelling in a medium. The minimum distance between the two particles, always having same speed, is

a. $\frac{\lambda}{4}$ b. $\frac{\lambda}{3}$ c. $\frac{\lambda}{2}$ d. λ

40. Which of the following properties show that light is a transverse wave?

a. Reflection b. Interference c. Diffraction d. Polarization

41. When light is refracted, which of the following does not change?

a. Amplitude b. Frequency c. Wavelength d. Velocity

42. If Young's double slit experiment is performed in water

a. the fringe width will decrease
b. the fringe width will increase
c. the fringe width will remain unchanged
d. there will be no fringe

43. A symmetric double convex lens is cut in two equal parts by a plane perpendicular to the principal axis. If the power of the original lens was 4 D, the power of the cut-lens will be
    a. 2D b. 3D c. 4D d. 5D

44. When current in a coil changes from 5 A to 2 A in 0.1 s, average voltage of 60 V is produced. The self-inductance of the coil is
    a. 2 H b. 3 H c. 6 H d. 8H

45. Value of current in an A.C. circuit is $I = 2\cos(\omega t + \theta)$.The value of I_{rms}
    a. $\sqrt{2}\,A$ b. $\frac{1}{\sqrt{2}}\,A$ c. $\frac{1}{2}\,A$ d. $2\,A$

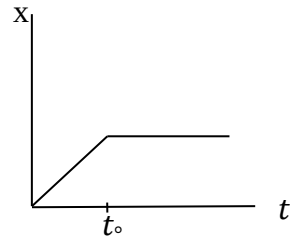
46. Two bodies of masses m and 2m are moving with same momentum. Then ratio of their kinetic energies will be
    a. 2:1 b. 4:1 c. 1:4 d. 1:2

47. The bob of a simple pendulum is a spherical hollow ball filled with water. A plugged hole near the bottom of the oscillating bob gets suddenly unplugged. During observation, till water is coming out, the time period of oscillation would
    a. Remain unchanged b. Increase towards a saturation value
    c. First increase and then decrease to the original value
    d. First decrease and then increase to the original value

48. If force $'F'$, velocity 'V' and time 'T' are fundamental quantities, which one is the dimension of energy
    a. $[\mathrm{F\,V^{-1}T^{-1}}]$ b. [F V T] c. $[\mathrm{F\,V\,T^{-1}}]$ d. $[\mathrm{F^{-1}V^{-1}T^{-1}}]$

49. The resultant of $\vec{A}$ and $\vec{B}$ makes an angle α with $\vec{A}$ and β with $\vec{B}$
    a. $\alpha < \beta \;\; if A > B$ b. $\alpha < \beta \;\; if \; A < B$ c. $\alpha < \beta$ d. $\alpha < \beta \; if \; A = B$

50. Figure below shows the displacement-time graph of a particle moving in X-axis



    a. the particle moves at a constant velocity up to a time $t_\circ$, and then stops
    b. the particle is continuously going in positive x direction
    c. the particle is at rest
    d. the velocity increases up to a time $t_\circ$, and then become constant.

51. If angle between two equal forces (F) is 90°, then the magnitude of the resultant is
    a. $F\sqrt{2}$ b. $\sqrt{2F}$ c. $2\sqrt{2F}$ d. $2F$

52. The displacement of a body from a fixed point at any instant is given by $x = 5t^2 + 6t + 4$, what type of motion the particle undergoes?
    a. with uniform velocity
    b. with uniform acceleration
    c. with non-uniformly accelerated motion
    d. can not be predicted

53. The horizontal range of projectile is $4\sqrt{3}$ times maximum height, angle of projectile is
    a. $30°$ b. $45°$ c. $60°$ d. $90°$

54. Electrons are the minority carriers in which type of semiconductor?
    a. Extrinsic b. Intrinsic c. n-type d. p-type

55. An airplane pilot sets a compass course due west and maintains an air speed of 210 km/hr. After flying for 0.50 hr, she finds herself over a town 120 km west and 20 km south of her starting point. What is the velocity of wind?
    a. 121.66 km/hr, $\tan^{-1}\frac{1}{6}$ west of south
    b. 121.166 km/hr, $\tan^{-1} 6$ west of south
    c. 50 km/hr, $\tan^{-1}\frac{3}{4}$ west of south
    d. 50 km/hr, $\tan^{-1}\frac{4}{3}$ west of south

56. A traffic light of weight w hangs from two lightweight cables, one on each side of the light. Each cable hangs at a $45°$ angle from the horizontal. What is the tension in each cable?
    a. $\sqrt{2}w\frac{w}{2}$ b. $2w$ c. $\frac{w}{\sqrt{2}}$ d. $\frac{w}{2}$

57. A copper rod of cross-sectional area $0.5\ cm^2$ and length $1\ m$ is elongated by $2 \times 10^{-2} mm$, and a steel rod of the same cross-sectional area but $0.10\ m$ in length is elongated by $2 \times 10^{-3}\ mm$. Which rod has greater tensile strain?
    a. the copper rod b. the steel rod c. the strain is same for both d. None of the above

58. A particle is executing S.H.M. with amplitude A. At what displacement from mean position its speed is $\frac{2}{3}$ of its maximum speed?
    a. $\frac{\sqrt{5}}{3}\ A$ b. $\frac{3}{\sqrt{5}}\ A$ c. $\sqrt{5}\ A$ d. $\frac{1}{3}A$

59. If earth contracts to half its radius, what would be the length of day?
    a. 24 hrs b. 12 hrs c. 6 hrs d. 3 hrs

60. At what depth below the surface of the earth the weight of a man will be one third of that on the surface of the earth?
    a. $\frac{1}{3}R$ b. $\frac{2}{3}R$ c. $\frac{1}{4}R$ d. $\frac{3}{4}R$

English

61. Here …… the hero, the leader of the village.

a. come b. came c. comes d. is coming

62. "I thought we were going on a picnic." Identify the adjectival form of the underlined word.
a. thoughtfully b. thoughtfulness c. think d. thoughtful

63. I have never …… pizza at Pizza hut before.
a. try b. trying c. tries d. tried

64. I wish it ……. a bright day today.
a. can b. will be c. is d. was

65. Will the order be …….. in an instant by her?
a. release b. releases c. releasing d. released

66. All his friends migrated …… one.
a. but b. and c. or d. so

67. I had no time to warn you. ……., I wasn't sure.
a. As for b. Beside c. Besides d. But

68. He hit ..... a dashing plan about the upcoming event.
a. in b. with c. upon d. on

69. You have to walk ..... the bridge to reach the post office.
a. on b. from c. over d. through

70. By 2050, they will …… the tunnel underwater.
a. have dug b. dig c. have been digging d. dug

71. Neither he nor his friends …… going abroad this year.
a. are b. is c. was d. must

72. If you had invited him, he …… to attend the meeting.
a. had tried b. haven't tried c. could had tried d. could have tried

73. I saw the …… of birds migrating towards the south.
a. school b. flock c. battalion d. pride

74. He was …… in the very first round of the bout.
a. knock out b. knocked out c. knocking out d. knocking out

75. Fear of books is called.....
a. misogyny b. hydrophobia c. bibliophobia d. agrophobia

76. Don't you dare come in……?
a. can't you b. won't you c. do you d. will you

77. The word "revelation" has the stress on ..... syllable.
a. First b. Second c. Third d. Fourth

78. The word "chamois" has the same initial consonant sound as the word.....
a. chaos b. call c. shirt d. silt

79. The father along with his sons ……. planting rice in the field.
a. is b. are c. can d. have

80. The …… of toothpaste has finished.
a. pinch b. tube c. slice d. bulb

Computer

81. 81. Which of the following is not a type of computer on the basis of operations?
a. Digital b. Analog c. Hybrid d. Remote

82. VDU stands for ……..
a. Virtual Display Unit b. Visual Display Unit
c. Virtual Detection Unit d. Visual Detection Unit

83. Brain of computer is ……
a. Control Unit b. Arithmetic and Logic Unit c. Memory d. Central Processing Unit

84. What is full form of USB?
a. Universal Serial Bus b. Uniform Service Broadcasting
c. Unique Solution Bus d. Universal Service Broadcasting

85. Which generation of computer used transistor?
a. Fourth b. Third c. Second d. First

86. Which device is used as the standard pointing device in a Graphical User Environment?
a. Keyboard b. Mouse c. Joystick d. Track Ball

87. Software required to run the hardware is known as ……
a. Task manager b. Task Bar c. Program manager d. Device Driver

88. Which of the following is system software?
a. Linux b. Word c. Excel d. Tally

89. Joystick is used for ……
a. Weather forecast b. Gaming c. Word processing d. e-mail writing

90. Which of the following part of a processor contains the hardware necessary to perform all the operations required by a computer?
a. Controller b. Registers c. Cache d. Data path

91. The ability to combine name and address with a standard document is called …….
a. Document formatting b. database management c. Mail merge d. form letters

92. Which of the following memory is non-volatile?
a. SRAM b. DRAM c. ROM d. all of the above

93. Which protocol provides e-mail facility among different hosts?
a. FTP b. SNMP c. TELNET d. SMTP

94. Time during which a job is processed by the computer is ……..
a. Execution time b. delay time c. Real time d. waiting time

95. What feature will you use to apply motion effect in between a slide exits and another enters?
a. Slide Design b. Slide Transition c. Animation Objects d. Animation Scheme

96. Fifth generation computers are based on …….
a. Artificial intelligence b. programming intelligence c. System knowledge d. VVLSI

97. The basic architecture of computer was developed by……
a. John Von Neumann b. Charles Babbage c. Blaise Pascal d. Graden Moore

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

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

100. Which of the following is designed to control the operations of a computer?
a. User b. Application Software c. System Software d. Utility Software

GOOD LUCK