PURBANCHAL UNIVERSITY

Gothgaun, Morang

Faculty of Engineering
Entrance Examination's Model Questions-2078

BE (Civil / Computer / Electrical / Electronics,Communication & Automation / Geomatic) / B. Arch.

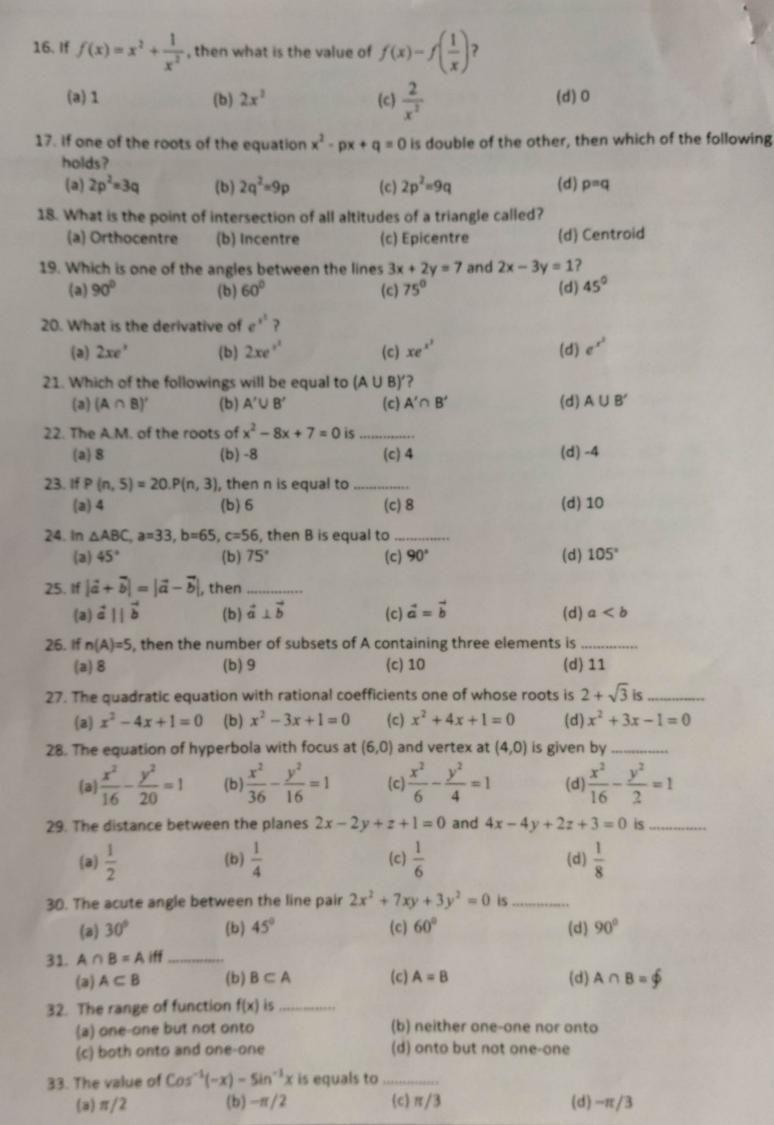Time: 2:00 Hours   Total Marks: 100

Choose the most appropriate answer and <u>DARKEN</u> the circle on the attached <u>ANSWER SHEET</u>. Answer all questions. All questions carry equal marks.

1. The oncologist studied the result of the biopsy and decided .... addition at first.
   (a) should order   (b) to order   (c) he should ordering   (d) ordering

2. Unless he had given me the money, I .... him.
   (a) wouldn't have helped   (b) would help
   (c) could help   (d) might help

3. He must dispense .... his services.
   (a) of   (b) with   (c) at   (d) in

4. My father is not only the town mayor, he runs .... too.
   (a) a business   (b) a piece of business (c) business   (d) some business

5. 'Speak the truth '. The passive is ....
   (a) you are ordered to speak the truth   (b) let the truth be spoken
   (c) truth must be spoken   (d) the truth should be spoken

6. How many syllables are there in the word "Punctuation"?
   (a) 6   (b) 5   (c) 4   (d) 3

7. Which of the following is not a punctuation mark?
   (a) full stop   (b) hash tag   (c) comma   (d) colon

8. We got our house .... for the party by Mary.
   (a) decorate   (b) decorated   (c) decorating   (d) to decorate

9. Mary's parents didn't let her .... out last night.
   (a) go   (b) gone   (c) to go   (d) going

10. The prefix "non" goes with which word?
    (a) talented   (b) regular   (c) injurious   (d) belief

11. .... Chinese language is difficult.
    (a) An   (b) A   (c) The   (d) None of these

12. Neither of workers was happy with the decision, ...?
    (a) were they   (b) weren't they   (c) was they   (d) wasn't they

13. My fingers were injured so my sister had to write the notes .... me.
    (a) with   (b) to   (c) for   (d) in

14. I have a Buddha statue at home. .... brown in color.
    (a) They   (b) It was   (c) It is   (d) Itself

15. The news has been brought to us by him. ....
    (a) He brought us the news.   (b) He has brought us the news.
    (c) He was brought the news to us.   (d) We brought the news for him.

16. If $f(x) = x^2 + \frac{1}{x^2}$, then what is the value of $f(x) - f\left(\frac{1}{x}\right)$?

(a) 1
(b) $2x^2$
(c) $\frac{2}{x^2}$
(d) 0

17. If one of the roots of the equation $x^2 - px + q = 0$ is double of the other, then which of the following holds?

(a) $2p^2 = 3q$
(b) $2q^2 = 9p$
(c) $2p^2 = 9q$
(d) $p = q$

18. What is the point of intersection of all altitudes of a triangle called?

(a) Orthocentre
(b) Incentre
(c) Epicentre
(d) Centroid

19. Which is one of the angles between the lines $3x + 2y = 7$ and $2x - 3y = 1$?

(a) 90^0
(b) 60^0
(c) 75^0
(d) 45^0

20. What is the derivative of e^{x^2}?

(a) $2xe^x$
(b) $2xe^{x^2}$
(c) xe^{x^2}
(d) e^{x^2}

21. Which of the followings will be equal to $(A \cup B)'$?

(a) $(A \cap B)'$
(b) $A' \cup B'$
(c) $A' \cap B'$
(d) $A \cup B'$

22. The A.M. of the roots of $x^2 - 8x + 7 = 0$ is ....

(a) 8
(b) -8
(c) 4
(d) -4

23. If $P(n, 5) = 20.P(n, 3)$, then n is equal to ....

(a) 4
(b) 6
(c) 8
(d) 10

24. In $\triangle ABC$, $a=33$, $b=65$, $c=56$, then B is equal to ....

(a) $45°$
(b) $75°$
(c) $90°$
(d) $105°$

25. If $|\vec{a} + \vec{b}| = |\vec{a} - \vec{b}|$, then ....

(a) $\vec{a} \parallel \vec{b}$
(b) $\vec{a} \perp \vec{b}$
(c) $\vec{a} = \vec{b}$
(d) $a < b$

26. If $n(A)=5$, then the number of subsets of A containing three elements is ....

(a) 8
(b) 9
(c) 10
(d) 11

27. The quadratic equation with rational coefficients one of whose roots is $2 + \sqrt{3}$ is ....

(a) $x^2 - 4x + 1 = 0$
(b) $x^2 - 3x + 1 = 0$
(c) $x^2 + 4x + 1 = 0$
(d) $x^2 + 3x - 1 = 0$

28. The equation of hyperbola with focus at $(6,0)$ and vertex at $(4,0)$ is given by ....

(a) $\frac{x^2}{16} - \frac{y^2}{20} = 1$
(b) $\frac{x^2}{36} - \frac{y^2}{16} = 1$
(c) $\frac{x^2}{6} - \frac{y^2}{4} = 1$
(d) $\frac{x^2}{16} - \frac{y^2}{2} = 1$

29. The distance between the planes $2x - 2y + z + 1 = 0$ and $4x - 4y + 2z + 3 = 0$ is ....

(a) $\frac{1}{2}$
(b) $\frac{1}{4}$
(c) $\frac{1}{6}$
(d) $\frac{1}{8}$

30. The acute angle between the line pair $2x^2 + 7xy + 3y^2 = 0$ is ....

(a) 30^0
(b) 45^0
(c) 60^0
(d) 90^0

31. $A \cap B = A$ iff ....

(a) $A \subset B$
(b) $B \subset A$
(c) $A = B$
(d) $A \cap B = \phi$

32. The range of function $f(x)$ is ....

(a) one-one but not onto
(b) neither one-one nor onto
(c) both onto and one-one
(d) onto but not one-one

33. The value of $\cos^{-1}(-x) - \sin^{-1}x$ is equals to ....

(a) $\pi/2$
(b) $-\pi/2$
(c) $\pi/3$
(d) $-\pi/3$

34. If a, b, c are in A.P., then 1/bc, 1/ca, 1/ab are in ....
    (a) A.P.   (b) G.P.   (c) H.P.   (d) A.P. – G.P.

35. Difference of slopes $12x^2 + 7xy - py^2 - 18x + qy + 6 = 0$ is ....
    (a) p = 12, q = 1   (b) p =1, q = 1   (c) p = -1, q = 12   (d) p = 1, q = -12

36. Distance between the parallel lines 5x + 12y = 0 and 5x + 12y – 39 = 0 is ....
    (a) 13   (b) 1/3   (c) 3   (d) 12

37. If the projections of a line segment on the coordinate axes are 5, 4, 3, then its length is ....
    (a) 12   (b) 50   (c) $7\sqrt{2}$ (d) $5\sqrt{2}$

38. The derivative of $Sin\ x^3$ with respect to $Cos\ x^3$ is ....
    (a) $-Tan\ x^3$ (b) $-3x\ Cot\ x^3$ (c) $x\ Cot\ x^3$ (d) $-Cot\ x^3$

39. $\int e^{-\log x}dx$ is equal to ....
    (a) $e^{-\log x} + C$ (b) $\log x + C$ (c) $-1/x^2 + C$ (d) $-x^2/2 + C$

40. Let $\vec{a}$ and $\vec{b}$ are two unit vectors and α be the angle between them. If $\vec{a}+\vec{b}$ is a unit vector, then
    α equals ....
    (a) $\pi/4$ (b) $\pi/3$ (c) $\pi/2$ (d) $2\pi/3$

41. The quantity which has only magnitude is called ....
    (a) a vector quantity (b) a scalar quantity   (c) a chemical quantity   (d) a magnitude quantity

42. Two lines are perpendicular if the product of their slopes is ....
    (a) 0   (b) 1   (c) -1   (d) None of these

43. How many terms of the series 64+ 32 + 16 + ...+t_n must be taken so that the sum may be 255/2?
    (a) 5   (b) 8   (c) 10   (d) 12

44. What is the magnitude of a unit vector?
    (a) It has no magnitude   (b) Zero
    (c) Constant but not zero   (d) Unity

45. For maxima and minima, the first derivative is equal to ....
    (a) 1   (b) 0   (c) 2   (d) 3

46. If the ordered pairs (x+y, 1) and (2, 2x-y) are equal, then ....
    (a) x = 2, y = 1   (b) x = 1, y = 1   (c) x = 1, y = 2   (d) x = 2, y = 2

47. The solution of $|2x+3| = 5$ are ....
    (a) 1, 4   (b) -1, 4   (c) 1, -4   (d) -1, -4

48. If a, 4, b are in A. P., a, 2, b are in G.P., then a, 1, b are in ....
    (a) A. P.   (b) G. P.   (c) H. P.   (d) No relation exists

49. The sum of the roots of the equation $x^2 +|x|-6 = 0$ is ....
    (a) -1   (b) 2   (c) 5   (d) 0

50. The radius of wheel on the rim of which an arc 12π cm long is subtended by a central angle of 36^0
    is ....
    (a) 30 cm   (b) 40 cm   (c) 50 cm   (d) 60 cm

51. The following four particles have the same momentum. Which one has maximum kinetic energy?
    (a) Electron   (b) Proton   (c) Deuteron   (d) α-particle

52. A force acts on a body in the direction of motion. The kinetic energy of body will ....
    (a) increase   (b) decrease   (c) remain the same (d) None of these

53. If a force F is applied on a body and it moves with a velocity v, the power will be ....
    (a) $F \times v$ (b) F/v (c) F/v^2 (d) $F \times v^2$

54. Angle of friction and angle of response are ....
(a) equal to each other
(b) not equal to each other
(c) proportional to each other
(d) None of these

55. A force of 100 g wt. is required to pull a body weighing 1 kg over ice. What is the coefficient of friction?
(a) 0.01
(b) 0.1
(c) 1
(d) 10

56. Specific heat of a body depends upon ....
(a) mass of body
(b) rise of temperature
(c) amount of heat supplied
(d) None of these

57. The r.m.s. speed of a gas molecule is ....
(a) directly proportional to T
(b) inversely proportional to T
(c) inversely proportional to molecular weight
(d) None of these

58. If the temperature of the source is increased, the efficiency of a Carnot engine ....
(a) increases
(b) decreases
(c) remains constant
(d) first increases and then remains constant

59. When sound travels from air to water, the quantity that remains unchanged is ....
(a) speed
(b) frequency
(c) intensity
(d) wavelength

60. A convex lens of focal length 0.5 m and concave lens of focal length 1 m are combined. The power of resulting lens will be ....
(a) 1 D
(b) −1 D
(c) 0.5 D
(d) −0.5 D

61. The Young's modulus of elasticity of a perfectly elastic body is ....
(a) Infinity
(b) 0
(c) 1
(d) -1

62. Rain drops fall with constant speed due to ....
(a) gravity
(b) surface tension
(c) viscosity
(d) shape

63. If the weight of a body in air is 40g and in water is 32g the specific gravity of the body is ....
(a) 1.14
(b) 0.88
(c) 10
(d) 5

64. If the temperature of a body in Celsius scale is -40°C, then its temperature in Fahrenheit scale is ...
(a) 232 °F
(b) 312 °F
(c) -40 °F
(d) -20 °F

65. The electric lines of force in uniform electric field are ....
(a) convergent
(b) divergent
(c) parallel
(d) circular

66. Laplace correction to determine the speed of sound follows ....
(a) Isothermal process
(b) Adiabatic process
(c) Isochoric process
(d) Isobaric process

67. Phon is a unit of ....
(a) frequency
(b) intensity
(c) amplitude
(d) loudness

68. If a ray cannot be polarized it may be ....
(a) sound wave
(b) light wave
(c) heat wave
(d) X-rays

69. High frequency capacitors offer ....
(a) more resistance
(b) less resistance
(c) zero resistance
(d) None of these

70. The constituents of proton are ....
(a) uud
(b) udd
(c) ddd
(d) uuu

71. A person on a moving train throws a coin upward and if it falls behind him then the train is ....
(a) accelerating
(b) decelerating
(c) moving at constant velocity
(d) retarding

72. If a lift of mass 500kg moves upward with the acceleration $2m/s^2$, the tension is ....
  (a) 5400
  (b) 5800
  (c) 6000
  (d) 6200

73. A body thrown up with the velocity of 50m/s, maximum horizontal distance it can cover is ....
  (a) 200m
  (b) 250m
  (c) 300m
  (d) 400m

74. The energy density of a wire of strain (S) is ....
  (a) $S^2/2Y$
  (b) $S^2Y/2$
  (c) $2S^2Y$
  (d) $2Y/S^2$

75. The pendulum of clock is made up of brass. If clock keeps correct time at 20 °C, how many seconds per day will it lose at 35 °C ($\alpha brass =2 \times 10^{-5}$ °C^{-1})?
  (a) 12.3 sec
  (b) 26.9 sec
  (c) 34.6 sec
  (d) 49.2 sec

76. At constant T, graph of P vs 1/V is ....
  (a) straight line
  (b) parabolic
  (c) ellipse
  (d) circle

77. What is angle of minimum deviation of a prism of angle 60° which has refractive index √2?
  (a) 90°
  (b) 60°
  (c) 45°
  (d) 30°

78. Velocity of sound is 330 m/s. The length of closed organ pipe having fundamental 16.5 Hz is ....
  (a) 350 cm
  (b) 240 cm
  (c) 500 cm
  (d) 380 cm

79. For every 1K rise of temperature, the velocity of sound increased by nearly ....
  (a) 1 m/s
  (b) 0.6 m/s
  (c) 0.4 m/s
  (d) 0.1 m/s

80. Two resistance wires A and B are of equal length and of same material. If area of cross section of the wire A is twice that of B and are connected in series with a battery, then the ratio of p.d. across A to B is ....
  (a) 0.2
  (b) 0.5
  (c) 1
  (d) 2

81. The solubility of gases in water depends on ....
  (a) Nature of gas
  (b) Pressure of gas
  (c) Both a and b
  (d) None of these

82. Water of crystallization of Epsom salt is ....
  (a) five
  (b) six
  (c) seven
  (d) eight

83. The total number of electrons in sub-shell having azimuthal quantum number 'l' is ....
  (a) 2l+ 1
  (b) l^2
  (c) 4l+2
  (d) l+1

84. Which of the following molecules is formed by sp hybridization?
  (a) C_2H_2
  (b) C_2H_4
  (c) C_2H_6
  (d) None of these

85. The compound that is not Lewis acid is ....
  (a) $BeCl_2$
  (b) $AlCl_3$
  (c) BCl_3
  (d) $SnCl_4$

86. Mohr's Salt is ....
  (a) $FeSO_4.7H_2O$
  (b) $Fe(NH_4)SO_4.6H_2O$
  (c) $FeSO_4.Al_2(SO_4)_3.2H_2O$
  (d) $FeSO_4.(NH_4)_2SO_4.6H_2O$

87. A gas will approach ideal behavior at ....
  (a) high temperature, low pressure
  (b) low temperature, high pressure
  (c) high temperature, high pressure
  (d) low temperature, low pressure

88. The number of unpaired electrons in Cr^{+++} ion are ....
  (a) 6
  (b) 2
  (c) 3
  (d) 1

89. Which one of the followings has the largest size?
  (a) Cl
  (b) Cl⁻
  (c) Br
  (d) Br

90. Most abundant element on earth is ....
  (a) O
  (b) Si
  (c) Al
  (d) Ca

91. Water softeners are used ....
    (a) to remove the impurities of water   (b) to increase conductivity
    (c) to remove the hardness of water   (d) to decrease conductivity

92. The H-O-H bond angle in a water molecule is about ....
    (a) $90°$ (b) $105°$ (c) $135°$ (d) $180°$

93. 25 cc of an alkali solution is mixed with 10 cc of 0.75 N acid which further required 20 cc of 0.8 N acid, the normality of alkali is ....
    (a) 2   (b) 1.3   (c) 0.94   (d) 0.47

94. At relatively high pressure, Van Der Waals' equation reduces to ....
    (a) $PV = RT$ (b) $PV = RT + a/v$ (c) $PV = RT + Pb$ (d) $PV = RT - a/V^2$

95. Mass number is equal to the ....
    (a) Number of protons + Number of electrons
    (b) Number of protons + Number of neutrons
    (c) Number of neutrons + Number of electrons
    (d) Number of electrons

96. Which of the followings is not a reducing agent?
    (a) CO_2 (b) SO_2 (c) NO_2 (d) ClO_2

97. Which of the followings forms the basis of the modern periodic table?
    (a) Atomic mass   (b) Atomic number   (c) Number of neutrons   (d) Atomic weight

98. In the third period of the periodic table, the element having smallest size is ....
    (a) Na   (b) Ar   (c) Cl   (d) Si

99. Formic acid is also called ....
    (a) Methanoic acid   (b) Ethanoic acid   (c) Carboxylic acid   (d) Acetone

100. In which of the followings, functional group isomerism is not possible?
    (a) Alcohols   (b) Aldehydes   (c) Alkyl halides   (d) Cyanides

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