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AMU MCA ENTRANCE PAPER 2018-19

1. A rod of weight W, supported by two parallel knife edges A and B, is in equilibrium at a horizontal position. The knives are at distance d from each other and the centre of mass of the rod is at distance x from A. The normal reaction on A is

(a) $\frac{xW}{d}$ (b) $\frac{Wd}{x}$

(c) $\frac{W(d-x)}{x}$ (d) $\frac{W(d-x)}{d}$

2. The origins of two frames of reference, s and s′ coincide initia e frame, s′ is moving with velocity $(2\hat{\imath} + 3\hat{\jmath} + 4\hat{k})$ m/s relative to s. After 2 seconds if t dinates of any point, as observed by an observer, at the origin of s are (4, 5, –6) m, the coo f the same point with respect to the frame of reference, s′ will be

(a) (0, –1, –14) (b) (0, +1, –14)

(c) (0, –1, +14) (d) (0, +1, +14)

3. The rest mass of an electron is m_o. If it is moving with velocity v = 0.6c (c is the velocity of light) its mass will be

(a) 0.8 m_o (b) m_o / 0.6

(c) 0.6 m_o (d) m_o / 0.8

4. An atomic clock is placed in a jet airplane. The clock measures a time interval of 3600s when the jet moves with speed 400 m/s. For an identical clock held by an observer at rest on the ground, the measured time interval would be larger than the previous measurement by

(a) 3.2×10^{-9} s (b) 10.6×10^{-6} s

(c) 8.2×10^{-6} s (d) 16.4×10^{-9} s

5. An RLC resonant circuit has a resonant frequency of 2 MHz and a Q-factor of 100. The sharpness of resonance will be

(a) 1 (b) 1/10

(c) 1/100 (d) 1/1000

6. The Superposition Theorem is essentially based on the concept of

(a) duality (b) reciprocity

(c) linearity (d) non-linearity

7. The power factor of a resonant series circuit is

(a) –1 (b) 0.5

(c) 0 (d) 1

8. Two polaroids are oriented with their planes perpendicular to incident light and transmission axis making an angle of 30° with each other. What fraction of incident unpolarised light is transmitted?

(a) 37.5% (b) 3.75%

(c) 27.5% (d) 2.75%

9. In a Newton's rings experiment, the diameter of the 5th ring was 0.336 cm and the diameter of the 15th ring was 0.590 cm. The radius of curvature of the plano-convex lens, if the wavelength of light used is 5890 Å, is

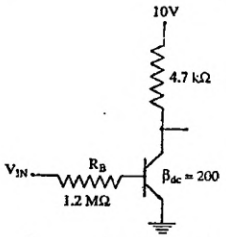
(a) 81.05 cm (b) 13.64 cm

(c) 99.82 cm (d) 116.36 cm

10. If the wavelength of the incident radiation is 5000 Å and the number of lines per inch on the grating is 2620, the number of orders that would be visible is

(a) 2 (b) 4
(c) 8 (d) 19

11. Referring to the figure given below, what would be the minimum value of I_B that will produce saturation ?



(a) 0.25×10^{-3} A (b) 5.325×10^{-6} A
(c) 1.065×10^{-6} A (d) 10.425×10^{-6} A

12. The self bias circuit is used in amplifier quite often because it

(a) limits the a.c. signal going to the base (b) makes the operating point almost independent of β
(c) reduces the d.c. base current (d) reduces the cost of the circuit

13. In three RC network of transistor phase-shift oscillator, which produces a phase-shift of 180° between its input and output voltage, the attenuation ratio β is

(a) $\frac{1}{49}$ (b) $-\frac{1}{49}$
(c) $-\frac{1}{29}$ (d) $\frac{1}{29}$

14. The Laurent series expansion of the fraction $f(z) = \frac{2+3z}{z^2+z^3}$ about z = 0

(a) $\frac{2}{z^2}+\frac{1}{z}-1+z-z^2+\cdots$ (b) $-\frac{2}{z^2}-\frac{1}{z}+1-z+z^2-\cdots$
(c) $\frac{1}{2}-\frac{z^2}{4!}+\frac{z^4}{6!}-\frac{z^6}{8!}+\cdots$ (d) $-\frac{1}{2}+\frac{z^2}{4!}-\frac{z^4}{6!}+\frac{z^6}{8!}-\cdots$

15. Value of the definite integral $\int_{-1}^{1} p_3^2(x)dx$ is (when p is the Legendre polynomial)

(a) 0 (b) 4/9
(c) 9/4 (d) 2/7

16. If $\vec{r} = x\hat{i} + y\hat{j} + z\hat{k}$ is a position vector, then the value of $\nabla(\log r)$ is

(a) $\frac{\vec{r}}{r}$ (b) $\frac{\vec{r}}{r^2}$
(c) $-\frac{\vec{r}}{r}$ (d) $\frac{\vec{r}}{r^3}$

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17. The recurrence formula for Legendre polynomial is

(a) $P_{n+1}(x) = \frac{2n+1}{n+1}xP_n(x) - \frac{n}{n+1}P_{n-1}(x)$ (b) $P_{n+1}(x) = \frac{2n}{n+1}xP_{n-1}(x) - \frac{n}{n+1}P_n(x)$
(c) $P_{n+1}(x) = \frac{2(n+1)}{n}P_{n+1}(x) - \frac{2n}{n+1}P_n(x)$ (d) $P_{n+1}(x) = \frac{2n}{n+1}xP_{n-1}(x) - \frac{2n+1}{n+1}P_{n-1}(x)$

18. X-rays of wavelength 0.6 Å, scattered from a block of carbon are viewed at an angle of 90° to the incident beam. The Compton shift Δλ is

(a) 4.84 A° (b) 0.0242 A°
(c) 0.121 A° (d) 0.00726 A°

19. In a simple cubic crystal the ratio of the intercepts of the three axes by (123) plane is

(a) 6 : 3 : 2 (b) 3 : 2 : 1
(c) 2 : 3 : 6 (d) 1 : 2 : 3

20. A spectroscopic transition involves an energy change of 3×10^{-21} J molecule^{-1}. If there are 1,500 molecules in the ground state, what is the equilibrium population of the state when the temperature is 300 K ?

(a) 3 (b) 91
(c) 727 (d) 10^{21}

21. Prefix expression of A/B^C – D is

(a) /–A B ^ C D (b) –/A ^ B C D
(c) ^/A–B C D (d) /–^ A B C D

22. Grant is a command from SQL type

(a) Data Definition Language (b) Data Manipulation Language
(c) Data Control Language (d) Data Retrieval Language

23. Worst case time complexity of quick sort is

(a) O (n) (b) O (n^2)
(c) O (log n) (d) O (n log n)

24. The reason for the implementation of the cache memory is

(a) To increase the internal memory of the system (b) To handle the difference in speeds of operation of the processor and memory
(c) To reduce the memory access and cycle time (d) All of the above

25. Which of the following are themselves a collection of different data types ?

(a) string (b) structures
(c) char (d) All of the mentioned

26. In wireless ad-hoc network

(a) access point is not required (b) access point is must
(c) nodes are not required (d) none of the mentioned

27. In a linked list implementation of a queue with two pointers front and rear, the time needed to insert an element in a queue of length n is

(a) O(1) (b) O($\log_2$ n)
(c) O(n) (d) O(n $\log_2$ n)

28. If an undirected graph with n vertices and e edges is represented by adjacency matrix, what is the time required to determine the degree of any vertex ?

(a) O(e) (b) O(n)
(c) $O(n^2)$ (d) O(e + n)

29. The 2's complement of the number 1101101 is

(a) 0101110 (b) 0111110
(c) 0110010 (d) 0010011

30. If $M = (1010100)_2$ & $N = (1000100)_2$ then the value of (M – N) using 1's complement is

(a) 10101 (b) 10001
(c) 10000 (d) 11001

31. FM radio uses ..... band of electromagnetic spectrum

(a) Low frequency (b) High frequency
(c) Very low frequency (d) Very High frequency

32. An entity relationship diagram is a tool to represent

(a) Data model (b) Process model
(c) Event model (d) Customer model

33. Suppose v is an isolated vertex in a graph, then the degree of v is

(a) 0 (b) 1
(c) 2 (d) 3

34. Example of metadata is

(a) E – R diagram (b) Data dictionary
(c) Table (d) Venn- diagram

35. Combination of IP address and Port numbe. is called

(a) Socket address (b) MAC address
(c) Host address (d) Network address

36. Class of IPv4 address 220.5.15.110 is

(a) A (b) B
(c) C (d) D

37. Six files F1, F2, F3, F4, F5 and F6 have 100, 200, 50, 80, 120, 150 number of records respectively. In what order should they be stored so as to optimize access time? Assume each file is accessed with the same frequency.

(a) F3, F4, F1, F5, F6, F2 (b) F2, F6, F5, F1, F4, F3
(c) F1, F2, F3, F4, F5, F6 (d) Ordering is immaterial as all files are accessed with the same frequency

38. Which of the following statements are true ?

I. As the number of entries in the hash table increases, the number of collisions increases.
II. Recursive programs are efficient.
III. The worst time complexity of quick sort is $O(n^2)$.
IV. Binary search implemented using a linked list is efficient.

(a) I and II (b) II and III
(c) I and IV (d) I and III

39. A compiler for a high level language that runs on one machine and produce code for different machine is called

(a) Optimizing compiler (b) One pass compiler
(c) Cross compiler (d) Multipass compiler

40. The technique used to store programs larger than the memory is _____.

(a) Overlays (b) Extension registers
(c) Buffers (d) Both (b) and (c)

41. Cost of 8 pens and 4 pencils is Rs. 176 and the cost of 2 pens and 2 pencils is Rs. 48. What is the cost of one pen ?

(a) Rs. 16 (b) Rs. 14
(c) Rs. 12 (d) Rs. 20

42. Aruna cut a cake into two halves and cut one half into smaller pieces of equal size. Each of the small piece is twenty grams in weight. If she has seven pieces of the cake in all with her, how heavy was the original cake ?

(a) 120 grams (b) 140 grams
(c) 240 grams (d) 280 grams

43. In a certain code language, 'put tir fin' means 'delicious juicy fruit' , 'tie dip sig' means 'beautiful white lily' and 'sig lon fin' means 'lily and fruit'. Which of the following stands for 'and' in that language ?

(a) lon (b) sig
(c) fin (d) put

44. The question mark in the series 1, 2, 3, 3, 4, 7, 5, 6, 11, ? should be replaced by

(a) 11 (b) 8
(c) 7 (d) 5

45. M and N are brothers. O and P are sisters. M's son is P's brother. How is N related to O ?

(a) Father (b) Brother
(c) Uncle (d) Grandfather

46. If 1st October is Sunday, then 1st November will be

(a) Monday (b) Tuesday
(c) Wednesday (d) Friday

47. A drawer contains 10 black and 10 brown socks which are all mixed up. What is the fewest number of socks you can take from the drawer without looking and be sure to get a pair of the same color?
(a) 7 pairs
(b) 7 pieces only
(c) 10 pieces only
(d) 3 pieces only

48. The question mark in the series 9 , 27 , 31 , 155 , 161 , 1127 , ? should be replaced by
(a) 316
(b) 1135
(c) 1288
(d) 2254

49. In a family of six persons, A, B, C, D, E and F, there are two married couples. D is grandmother of A and mother of B. C is wife of B and mother of F. F is the granddaughter of E. Who among the following is one of the couples ?
(a) CD
(b) DE
(c) EB
(d) DF

50. Five boys took part in a race. Raj finished before Mohit but behind Gaurav. Ashish finished before Sanchit but behind Mohit. Who won the race ?
(a) Raj
(b) Gaurav
(c) Mohit
(d) Ashish

51. The directional derivative of the scalar function $f(x, y, z) = x^2 + xy + z^2$ at the point A(1, -1, -1) in the direction of the line AB, where B has co-ordinates (3, 2, 1), is
(a) $\frac{1}{\sqrt{2}}$
(b) $\frac{1}{2}$
(c) $\frac{1}{\sqrt{17}}$
(d) 6

52. The extremal of the functional $I = \int_0^1 (y'^2 + 12xy)dx$ such that $y(0) = 0, y(1) = 1$ has
(a) no critical point at $x = 0$
(b) point of maxima at $x = 0$
(c) point of minima at $x = 0$
(d) point of inflexion at $x = 0$

53. Let $T : R^3 \to R^3$ be a linear transformation having eigenvalue 5 with an eigenvector (-1, 1, 4), then the eigenvalue of $T^2 - 5T + 2I$ is
(a) 5
(b) 4
(c) 3
(d) 2

54. The equation of the cylinder whose generators are parallel to z-axis and which passes through a circle whose centre is (a, 0, 0) and radius 'a', lying in the plane $z = 0$, is
(a) $x^2 + y^2 - 2az = 0$
(b) $x^2 + y^2 - ax - 2ay = 0$
(c) $x^2 + y^2 - 2ax - ay = a^2$
(d) $x^2 + y^2 - 2ax = 0$

55. Let $\mathbb{R}^2 = \{ (x, y) \mid x, y \in \mathbb{R} \}$ be the vector space over the field of real numbers $\mathbb{R}$.
Let $W = \{ (x, 0) \mid x \in \mathbb{R} \}$ be the subspace of $\mathbb{R}^2$. Geometrically, the quotient space $\mathbb{R}^2/W$ represents,
(a) the set of all straight lines parallel to $y=x$
(b) the set of all straight lines perpendicular to line $y = 2x + 6$.
(c) the set of all straight lines parallel to x-axis
(d) the set of all straight lines parallel to y-axis

P.T.O.

56. The plane $x + 2y - 3z = 4$ touches the conicoid $x^2 - y^2 + kz^2 = 1$ then the value of k is
(a) 9/19
(b) 19/9
(c) 7/19
(d) 11/19

57. The c-discriminant of the differential equation $p^3 - 4pxy + 8y^2 = 0$ equals
(a) $y^2 = 27x^3$
(b) $y(27y - 4x^3) = 0$
(c) $x(27x - 4y^3) = 0$
(d) $y(4x - 27y^3) = 0$

58. The area of the region between the x-axis and the graph of $f(x) = x^3 - x^2 - 2x, -1 \le x \le 2$, is
(a) $\frac{27}{12}$
(b) $\frac{37}{12}$
(c) $\frac{5}{12}$
(d) $\frac{8}{3}$

59. The number of real roots of $f(x) = x^3 + 3x^2 + 3x + 7$ is / are
(a) Zero
(b) One
(c) Two
(d) Three

60. The complete solution of $\frac{\partial^2 z}{\partial x^2} + \frac{\partial^2 z}{\partial x \partial y} - 2\frac{\partial^2 z}{\partial y^2} = ycosx$, is
(a) $z = \phi_1(y+x) + \phi_2(y-2x) + \sin x + y\cos x$
(b) $z = \phi_1(y+x) + \phi_2(y-2x) + \sin x - y\cos x$
(c) $z = \phi_1(y-x) + \phi_2(y+2x) + \sin x + y\cos x$
(d) $z = \phi_1(y-x) + \phi_2(y+2x) + \sin x - y\cos x$

61. The value of $\int_0^\infty \int_x^\infty \frac{e^{-y}}{y}\, dy\, dx$ is
(a) Zero
(b) $\frac{3}{4}$
(c) 1
(d) $\frac{1}{4}$

62. Consider the following statements :
I : The convergence method of secant method is 1.61.
II : Convergence of Regula-Falsi method is linear.
III : Bisection method is based upon the repeated application of "intermediate value theorem".
Which of the following options is correct ?
(a) Only I and II are correct
(b) Only I and III are correct
(c) Only II and III are correct
(d) All three I, II and III are correct

63. The asymptotes of the hyperbola $xy = hx + ky$ are
(a) $x - k = 0$ and $y - h = 0$
(b) $x + h = 0$ and $y + k = 0$
(c) $x - k = 0$ and $y + h = 0$
(d) $x + k = 0$ and $y - h = 0$

64. If enveloping cone of the sphere $x^2 + y^2 + z^2 - 2az = 0$ is cut by the plane $z = 0$ in a parabola, then the locus of the vertex of the cone is
(a) $z^2(x^2+y^2+z^2+4az+4a^2) = 2az(x^2-y^2)$
(b) $z^2(x^2+y^2+z^2-4az+4a^2) = 2az(x^2+y^2)$
(c) $x^2 + y^2 + z^2 = a^2$
(d) $yz + zx + xy = 0$

65. Consider the following statements :

I : $L(L(S)) = L(S)$; where $L(S)$ denotes the linear span of a subset S in any vector space V.

II : $W_1 \cap (W_2 + W_3) \subseteq (W_1 \cap W_2) + (W_1 \cap W_3)$

III : $W_1 \cap (W_2 + W_3) \supseteq (W_1 \cap W_2) + (W_1 \cap W_3)$

where W_1, W_2, W_3 are arbitrary subspaces of vector space V.

Which of the above statement / statements is / are incorrect.

(a) III only (b) II only

(c) I and II only (d) II and III only

66. Consider the group R^* (non-zero reals) under multiplication. Define binary operation 'o' on R^* such that for every $x,y \in R^*$, $xoy = \frac{xy}{6}$, then the inverse of $4 \in R^*$ under operation 'o' is equal to

(a) 4 (b) 6

(c) 9 (d) 12

67. Let $f : \mathbb{R}^2 \to \mathbb{R}$ such that $\frac{\partial f}{\partial x}$ and $\frac{\partial f}{\partial y}$ exist at all points. Then,

(a) The total derivative of f exists at all points of $\mathbb{R}^2$. (b) f is continuous on $\mathbb{R}^2$.

(c) The function $f(x,y)$ as a function of x for every fixed y and $f(x,y)$ as a function of y for every fixed x are continuous. (d) all directional derivatives of f exist at all points of $\mathbb{R}^2$.

68. The solution of the differential equation $x^2\frac{d^2y}{dx^2} + 3x\frac{dy}{dx} + y = x + \log x$, is

(a) $y = \frac{c_1}{x} + \frac{c_2 \log x}{x} + \log x + \frac{1}{4}x - 2$ (b) $y = \frac{c_1}{x} + \frac{c_2 \log x}{x} + \log x + x - 2$

(c) $y = c_1 x + \frac{c_2}{x} + \log x + \frac{1}{4}x - 2$ (d) $y = c_1 x + c_2 x \log x + \log x + \frac{1}{4}x - 2$

69. The value of the integral $\oint_C xydy - y^2\,dx$, where C is the square cut from the first quadrant by the lines $x = 1$ and $y = 1$ is

(a) $\frac{3}{2}$ (b) 3

(c) $\frac{1}{2}$ (d) $\frac{3}{4}$

70. If h is the interval of differencing, then $(\Delta - \nabla)\,x^2$ equals to :

(a) 2h (b) $2h^2$

(c) $2h^3$ (d) None of these

71. If the slope of one of the lines of $3x^2 + 2hxy + 2y^2 = 0$ is twice that of the other, then h =

(a) ± 3 (b) $\pm\frac{3\sqrt{3}}{2}$

(c) $\pm\frac{16}{3}$ (d) ± 2

72. The equations of the tangent planes to the paraboloid $2x^2 - 3y^2 = 2z$, which pass through the line $\frac{x-1}{3} = \frac{y-1}{-2} = \frac{z}{12}$ are

(a) $6x - z = 3,\ 10y - z = 10$ (b) $4x - z = 4,\ 6y + z = 6$

(c) $4x + z = 4,\ 10y + z = 10$ (d) $6x + z = 3,\ 6y - z = 6$

73. Let V be the space of all $n \times n$ matrices and $T : V \to V$ be a linear operator defined by $T(A) = \frac{1}{2}(A + A^T)$, then nullity of T is

(a) 2n (b) $\frac{n^2}{2}$

(c) $\frac{n(n+1)}{2}$ (d) $\frac{n(n-1)}{2}$

74. If the radius of a cylinder is measured with maximum error of 2%, height is measured with maximum error of 0.5%, then the maximum possible error in the computation of volume of the cylinder is

(a) 4.25% (b) 5%

(c) 4% (d) 4.5%

75. For the function $y = 1 - x^4$, the point $x = 0$ is a point of

(a) inflection (b) minima

(c) maxima (d) absolute minima

76. The complete solution of $p(q^2+1) + (b - z)\,q = 0$, is

(a) $2\sqrt{a(z-b)-1} = x + ay + b'$ (b) $2\sqrt{a(z+b)+1} = x + ay + b'$

(c) $2\sqrt{a(z-b)^2-1} = x + ay + b'$ (d) $2\sqrt{a(z+b)^2+1} = x + ay + b'$

77. The centres of the sections of $ax^2 + by^2 + cz^2 = 1$ by the planes which are at a constant distance p from the origin lie on the surface

(a) $(ax^2+by^2+cz^2)^2 = p^2(a^2x^2+b^2y^2+c^2z^2)$ (b) $(ax+by+cz)^2 = p\,(a^2x^2+b^2y^2+c^2z^2)$

(c) $(ax+by+cz) = p^2(x^2+y^2+cz^2)^2$ (d) $(a^2x^2+b^2y^2+c^2z^2)^2 = p\,(ax+by+cz)^2$

78. If $W_1 = \{(x, y, z) \mid x + y - z = 0\}$,

$W_2 = \{(x, y, z) \mid 3x + y - 2z = 0\}$ and

$W_3 = \{(x, y, z) \mid x - 7y + 3z = 0\}$,

are subspaces of R^3, then $\dim(W_1 \cap W_2 \cap W_3)$ is

(a) 0 (b) 2

(c) 3 (d) 1

79. If $f(x) = (x + |x|)\,|x|$, for all $x \in \mathbb{R}$, where $\mathbb{R}$ denotes the set of real numbers, then which of the following is incorrect?

(a) f is continuous (b) f' is continuous

(c) f' is not differentiable for some x (d) f' is differentiable

80. The length of the astroid $x = \cos^3 t$, $y = \sin^3 t$, $0 \le t \le 2\pi$, is

(a) 3/2 (b) 3

(c) 6 (d) 9

81. If $A = \begin{bmatrix} 1 & -2 & 3 \\ 0 & 5 & 0 \\ 2 & 4 & 3 \end{bmatrix}$, then A^{-1} equals,

(a) $A^2 - 9A - 17\,I_3$ (b) $\frac{1}{15}(A^2 + 9A - 16\,I_3)$

(c) $A^2 + 6A - 17\,I_3$ (d) $-\frac{1}{15}(A^2 - 9A + 17\,I_3)$

82. The equation of integral surface of partial differential equation $(x-y)p+(y-x-z)q=z$, which passes through the circle $z=1, x^2+y^2=1$, will be

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

83. The area of the cap cut from the hemisphere $x^2+y^2+z^2=2; z\geq 0$, by the cylinder $x^2+y^2=1$ is :

(a) 2π (b) $2\sqrt{2}\pi$
(c) $2\pi(2-\sqrt{2})$ (d) $2\pi(2+\sqrt{2})$

84. For the function $f=(x,y)=\begin{cases}0, & xy\neq 0\\ k, & xy=0\end{cases}$

Which of the following statements is true ?

(a) function is discontinuous at origin if k=0 (b) function is discontinuous at origin because it is not defined there
(c) limit of the function does not exist at origin if $k\neq 0$ (d) None of these

85. In the Gauss elimination method for solving a system of algebraic equations, triangularization leads to

(a) diagonal matrix (b) lower triangular matrix
(c) upper triangular matrix (d) singular matrix

86. If rank correlation coefficient (r) is 0.4, $\sum_i d_i^2=72$ and no rank is repeated, then n is equal to

(a) 8 (b) 7
(c) 6 (d) 9

87. For a bivariate data (x_i, y_i), $i=1, 2, \ldots\ldots n$, we have $\sigma_y=2\sigma_x$ and the tangent of the angle between x-axis and the line of regression of y on x is 0.6, then the coefficient of correlation between x and y is

(a) 0.5 (b) 0.3
(c) –0.2 (d) 0.9

88. Suppose that $P(X=a)=p$, $P(X=b)=1-p$, then $V(X)$ is equal to

(a) $abp(1-p)$ (b) $a^2b^2p(1-p)$
(c) $(a-b)p(1-p)$ (d) $(a-b)^2p(1-p)$

89. If X is a geometric random variable with parameter p, then $E\left(\frac{1}{X}\right)$ is equal to

(a) $-\frac{p}{q}\log(p)$ (b) $\frac{q}{p}\log(p)$
(c) $\frac{p}{q}\log(p)$ (d) $-\frac{q}{p}\log(p)$

90. The linear function which is to be minimized (or maximized) is called :

(a) Feasible function (b) Optimal function
(c) Objective function (d) Constraint

91. In five tosses of a fair coin, the chance of getting three heads is

(a) 1/8 (b) 3/32
(c) 5/8 (d) 5/16

P.T.O.

92. An urn contains n balls numbered 1 through n. If m balls are withdrawn randomely in sequence, each time replacing the ball selected previously, then $P(X=K)$, $K=1, 2, \ldots\ldots, m$ and where X is the maximum of the m chosen numbers, is equal to -

(a) $\left(\frac{K}{n}\right)^m$ (b) $\left(\frac{K-1}{n}\right)^m$
(c) $\left(\frac{K+1}{n}\right)^m$ (d) $\left(\frac{K}{n}\right)^m-\left(\frac{K-1}{n}\right)^m$

93. The value of β_2 for a mesokurtic curve is

(a) 0 (b) 3
(c) 1 (d) -1

94. Mean is a measure of

(a) location (b) dispersion
(c) correlation (d) extreme values

95. If two regression coefficients are given as $b_{xy}=-0.8$ and $b_{yx}=-1.2$, then correlation coefficient γ_{xy} is equal to

(a) 0.96 (b) –0.96
(c) 0.979 (d) –0.979

96. A population has 4 units 1, 2, 3, 4 possessing the values 2, 3, 4 and 6 for the study variable. The variance of the sample mean S when the sampling is without replacement equals

(a) 1.09 (b) 3.75
(c) 0.73 (d) 0.99

97. If $P(B)=\frac{3}{4}$, $P(A\cap B\cap \bar{C})=\frac{1}{3}$ and $P(\bar{A}\cap B\cap \bar{C})=\frac{1}{3}$, then $P(B\cap C)$ is

(a) 2/9 (b) 3/7
(c) 1/12 (d) 4/5

98. If $f(x)=\lambda e^{-ax}\ (a>0)$ for $0\leq x<\infty$ is a probability density, then λ is equal to

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

99. In simple random sampling without replacement, the variance of the sample mean (for small sample) is given by

(a) $\frac{(N-1)}{N}.S^2$ (b) $\frac{\sigma^2}{n}$
(c) $\frac{(N-n)}{nN}.S^2$ (d) $\frac{\sigma^2}{\sqrt{n}}$

100. If $x_1, x_2, \ldots\ldots x_n$ be a random sample from $N(\mu, 1)$, then an unbiased estimator of μ^2+1 is

(a) $\frac{1}{n}\sum_{i=1}^{n}x_i^2$ (b) $\frac{1}{n-1}\sum_{i=1}^{n}x_i^2$
(c) $\frac{1}{n}\sum_{i=1}^{n}x_i$ (d) $\frac{1}{n}\sum_{i=1}^{n}(x_i-\bar{x})^2$

ANSWER SECTION

1	A	B	C	D	41	A	B	C	D	81	A	B	C	D	121	A	B	C	D	161	A	B	C	D
2	A	B	C	D	42	A	B	C	D	82	A	B	C	D	122	A	B	C	D	162	A	B	C	D
3	A	B	C	D	43	A	B	C	D	83	A	B	C	D	123	A	B	C	D	163	A	B	C	D
4	A	B	C	D	44	A	B	C	D	84	A	B	C	D	124	A	B	C	D	164	A	B	C	D
5	A	B	C	D	45	A	B	C	D	85	A	B	C	D	125	A	B	C	D	165	A	B	C	D
6	A	B	C	D	46	A	B	C	D	86	A	B	C	D	126	A	B	C	D	166	A	B	C	D
7	A	B	C	D	47	A	B	C	D	87	A	B	C	D	127	A	B	C	D	167	A	B	C	D
8	A	B	C	D	48	A	B	C	D	88	A	B	C	D	128	A	B	C	D	168	A	B	C	D
9	A	B	C	D	49	A	B	C	D	89	A	B	C	D	129	A	B	C	D	169	A	B	C	D
10	A	B	C	D	50	A	B	C	D	90	A	B	C	D	130	A	B	C	D	170	A	B	C	D
11	A	B	C	D	51	A	B	C	D	91	A	B	C	D	131	A	B	C	D	171	A	B	C	D
12	A	B	C	D	52	A	B	C	D	92	A	B	C	D	132	A	B	C	D	172	A	B	C	D
13	A	B	C	D	53	A	B	C	D	93	A	B	C	D	133	A	B	C	D	173	A	B	C	D
14	A	B	C	D	54	A	B	C	D	94	A	B	C	D	134	A	B	C	D	174	A	B	C	D
15	A	B	C	D	55	A	B	C	D	95	A	B	C	D	135	A	B	C	D	175	A	B	C	D
16	A	B	C	D	56	A	B	C	D	96	A	B	C	D	136	A	B	C	D	176	A	B	C	D
17	A	B	C	D	57	A	B	C	D	97	A	B	C	D	137	A	B	C	D	177	A	B	C	D
18	A	B	C	D	58	A	B	C	D	98	A	B	C	D	138	A	B	C	D	178	A	B	C	D
19	A	B	C	D	59	A	B	C	D	99	A	B	C	D	139	A	B	C	D	179	A	B	C	D
20	A	B	C	D	60	A	B	C	D	100	A	B	C	D	140	A	B	C	D	180	A	B	C	D
21	A	B	C	D	61	A	B	C	D	101	A	B	C	D	141	A	B	C	D	181	A	B	C	D
22	A	B	C	D	62	A	B	C	D	102	A	B	C	D	142	A	B	C	D	182	A	B	C	D
23	A	B	C	D	63	A	B	C	D	103	A	B	C	D	143	A	B	C	D	183	A	B	C	D
24	A	B	C	D	64	A	B	C	D	104	A	B	C	D	144	A	B	C	D	184	A	B	C	D
25	A	B	C	D	65	A	B	C	D	105	A	B	C	D	145	A	B	C	D	185	A	B	C	D
26	A	B	C	D	66	A	B	C	D	106	A	B	C	D	146	A	B	C	D	186	A	B	C	D
27	A	B	C	D	67	A	B	C	D	107	A	B	C	D	147	A	B	C	D	187	A	B	C	D
28	A	B	C	D	68	A	B	C	D	108	A	B	C	D	148	A	B	C	D	188	A	B	C	D
29	A	B	C	D	69	A	B	C	D	109	A	B	C	D	149	A	B	C	D	189	A	B	C	D
30	A	B	C	D	70	A	B	C	D	110	A	B	C	D	150	A	B	C	D	190	A	B	C	D
31	A	B	C	D	71	A	B	C	D	111	A	B	C	D	151	A	B	C	D	191	A	B	C	D
32	A	B	C	D	72	A	B	C	D	112	A	B	C	D	152	A	B	C	D	192	A	B	C	D
33	A	B	C	D	73	A	B	C	D	113	A	B	C	D	153	A	B	C	D	193	A	B	C	D
34	A	B	C	D	74	A	B	C	D	114	A	B	C	D	154	A	B	C	D	194	A	B	C	D
35	A	B	C	D	75	A	B	C	D	115	A	B	C	D	155	A	B	C	D	195	A	B	C	D
36	A	B	C	D	76	A	B	C	D	116	A	B	C	D	156	A	B	C	D	196	A	B	C	D
37	A	B	C	D	77	A	B	C	D	117	A	B	C	D	157	A	B	C	D	197	A	B	C	D
38	A	B	C	D	78	A	B	C	D	118	A	B	C	D	158	A	B	C	D	198	A	B	C	D
39	A	B	C	D	79	A	B	C	D	119	A	B	C	D	159	A	B	C	D	199	A	B	C	D
40	A	B	C	D	80	A	B	C	D	120	A	B	C	D	160	A	B	C	D	200	A	B	C	D

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