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1. .Let f(x)= $|x|$ and $g(x) = |x^3|$, then at $x = 0$:
   (a)f (x) and g (x) are both continuous
   (b)f (x) and g (x) are both differentiable
   (c)f (x) is differentiable but g (x) is not differentiable
   (d)f (x) is not continuous bur g (x) is continuous
2. $\lim_{x\to 1} \frac{x+x^2+\cdots+x^n-n}{x-1}$ is :
   (a)0 (b)n (c)$\frac{n(n-1)}{2}$ (d) $\frac{n(n+1)}{2}$
3. The value of the derivative of $|x-1| + |x-3|$ at x = 2 is:
   (a)cannot be found (b)-2 (c)0 (d)2
4. If $x^m y^n = (x + y)^{m+n}$, then $\frac{dy}{dx}$ is equal to:
   (a) $\frac{y}{x}$ (b) $\frac{py}{qx}$ (c) $\frac{qy}{px}$ (d) $\frac{x}{y}$
5. If $3^x + 3^y = 3^{x+y}$, then the value of $\frac{dy}{dx}$ at $x = 1, y = 1$ *is*:
   (a)-1 (b)0 (c)1 (d)3
6. If $\begin{vmatrix} a & b & 0 \\ 0 & a & b \\ b & a & 0 \end{vmatrix} = 0$, then
   (a) a = b = -1 (b)a = b = 1
   (c)$\frac{a}{b}$ is a cube root of unity
   (d) $\frac{a}{b}$ is a cube root of - 1
7. If α, β, γ are the roots of the equation $x^2 + px + q = 0$ (with $p \neq 0, q \neq 0$), then the value of the determinant $\begin{vmatrix} \alpha & \beta & \gamma \\ \beta & \gamma & \alpha \\ \gamma & \alpha & \beta \end{vmatrix}$ is:
   (a)0 (b)p (c)q (d) $p^2 - 2q$
8. In the expansion of $\left(x^3 - \frac{1}{x^2}\right)^{15}$, the term independent of x is:
   (a)-$^{15}C_9$ (b)0 (c)1 (d) $^{15}C_9$
9. If the coefficients of the middle term in the expansion of $(1 + x)^{2n+2}$ is p and the coefficient of middle terms in the expansion of $(1 + x)^{2n+1}$ are q and r, then:
   (a)p = q + r (b)q = p + r (c)r = p + q (d)2p = q + r
10. Arithmetic Mean of 10 consecutive natural numbers is 'M', then the Arithmetic Mean of the next 10 consecutive natural numbers is:
    (a)can not be found (b)M
    (c)M + 5 (d) M + 10
11. If G_1, G_2 are the geometric means of two series of observations and G is the geometric mean of the ratios the corresponding observations, then G is equal to:
    (a) $\frac{G_1}{G_2}$ (b) $logG_1 - logG_2$
    (c) $\frac{logG_1}{logG_2}$ (d)$log\ \frac{G_1}{G_2}$
12. For fitting a polynomial of K^{th} – degree, there should be:
    (a)K Normal equations in K unknowns
    (b)K Normal equations in (K+1) unknowns
    (c)K + 1 Normal equations in (K + 1) unknowns
    (d)K + 1 Normal equations in K unknowns
13. In an experiment, a coin is tossed twice. If the second toss results in a head, a die is rolled. The number of elements in the sample space is:
    (a)9 (b)12 (c)14 (d)16
14. For two events A, B associated with a random experiment, B ⊂ A, then $P(A \cap \bar{B})$is equal to:
    (a) $P(A) - P(B)$ (b) $P(A) - 1 + P(B)$
    (c) $P(A) + 1 - P(B)$ (d) $P(A) - 1 - P(B)$
15. Which of the following statements is correct?
    (a)Every LPP admits and optimal solution.
    (b)Every LPP admits a unique optimal solution.
    (c)Every LPP admits an infinite number of optimal solutions.
    (d)If a LPP admits two optimal solutions, is has an infinite number of optimal solutions.
16. Consider the following statements:
    A: the set of all feasible solutions of a LPP is called the feasible region.
    B: The set of all feasible solutions is a convex set. In your opinion:
    (a)Only A is correct
    (b)Only B is correct
    (c)Both A and B are correct
    (d)Both A and B are incorrect
17. If A and B are two sets, then A∩ $(A \cap B)$ equals:
    (a)ϕ (b)A (c)B (d)A∩ B
18. A set contains n elements. The power set contains
    (a)n elements (b) n^2 elements
    (c) 2^n elements (d) n^n elements
19. In an examination, 60% candidates passed in Physics, 75% passed in Mathematics. If x% passed in both, then:
    (a) $15 \leq x \leq 60$ (b) $15 \leq x \leq 75$
    (c) $35 \leq x \leq 75$ (d) $35 \leq x \leq 60$
20. If A = {1, 2, 3}, B= {2, 3, 4} and C = {2, 4}, then the number of elements in (A-B) × $(B - C)$ is:
    (a)1 (b)2 (c)3 (d)4
21. The value of $\frac{1-tan^2 15^\circ}{1+tan^2 15^\circ}$ is:
    (a)$\frac{\sqrt{3}}{2}$ (b)1 (c) $\sqrt{3}$ (d)2
22. The value of $|sinx + cosx|$ is:
    (a)$\leq -\frac{1}{\sqrt{2}}$ (b) $\leq \sqrt{2}$ (c) ≤ 2 (d) $\geq \sqrt{2}$
23. In a triangle ABC, a = 5, b = 4, $\angle A = 60^\circ$, then c is the root of the equation:
    (a) $c^2 + 4c + 9 = 0$ (b) $c^2 + 4c - 9 = 0$
    (c) $c^2 - 4c - 9 = 0$ (d) $c^2 - 4c + 9 = 0$
24. If the angles of a triangle are in the ratio 3:2:1, the corresponding sides are in the ratio:
    (a)1:2:3 (b)1:$\frac{1}{2}$:$\sqrt{3}$ (c)2: $\sqrt{3}$:1 (d)3:2:1

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25. In a triangle ABC, $\frac{b+c}{8} = \frac{c+c}{9} = \frac{a+b}{7}$,then the value of cos c is:
(a)0 (b) $\frac{3}{5}$ (c) $\frac{4}{5}$ (d)1

26. The least possible value of n for which $\left(\frac{1-i}{1-i}\right)^n$ is real is:
(a)1 (b)2 (c)3 (d)4

27. If w is the cube root of unity, then w, w^2 are the roots of:
(a) $z^2 + z + 1 = 0$ (b) $z^2 - z + 1 = 0$
(c) $z^2 - z - 1 = 0$ (d) $z^2 + z - 1 = 0$

28. If $z + z^{-1} + 1 = 0$, then $z^{200} + z^{-200}$ is equal to:
(a)-i (b)i (c)1 (d)-1

29. The number of vectors of unit length perpendicular to the vectors $\hat{\imath} + \hat{\jmath} + \hat{k}$ and $\hat{\imath} + \hat{\jmath} + k$ is:
(a)2 (b)1 (c)3 (d)Infinite

30. A force $\bar{F} = 2\hat{\imath} - \hat{\jmath} + \hat{k}$ is acting at a point which is displaced from point A to B. If the position vectors of A and B are $2\hat{\imath} + \hat{\jmath} + 2\hat{k}$ and $3\hat{\imath} - \hat{\jmath} + 2\hat{k}$ respectively, the work done by the force is:
(a)2 units (b)3 units (c)4 units (d)5 units

31. A force $\bar{P} = \hat{\imath} + 2\hat{\jmath} + 3\hat{k}$ is acting at a point A whose position relative to origin is $\hat{\imath} + \hat{\jmath} + \hat{k}$. The moment of the force about the origin is:
(a) $\hat{\imath} + 2\hat{\jmath} + \hat{k}$ (b) $\hat{\imath} - 2\hat{\jmath} + \hat{k}$ (c) $\hat{\imath} + \hat{\jmath} - 2\hat{k}$ (d) $\hat{\imath} + \hat{\jmath} + 2\hat{k}$

32. If the vectors $\underset{a}{\rightarrow} = 3\hat{\imath} + \hat{\jmath} - 2\hat{k}$, $\underset{b}{\rightarrow} = -\hat{\imath} + 3\hat{\jmath} + 4\hat{k}$ and $\underset{c}{\rightarrow} = 4\hat{\imath} - 2\hat{\jmath} + \lambda\hat{k}$ form the sides of a triangle, then the value of λ is:
(a)2 (b)-4 (c)-6 (d)6

33. A rigid body is rotating at 2.5 radians per second about an axis AB, where A and B are points $\hat{\imath} - 2\hat{\jmath} + \hat{k}$ and $3\hat{\imath} - 4\hat{\jmath} + 2\hat{k}$. The velocity of the particle P of the body at the point $5\hat{\imath} - \hat{\jmath} - \hat{k}$ is:
(a) $\hat{\imath} - 5\hat{\jmath} + 6\hat{k}$ (b)$-2\hat{\imath} + 13\hat{\jmath} + 8\hat{k}$ (c) $2\hat{\imath} - \hat{\jmath} + \hat{k}$ (d) $5\hat{\imath} - 4\hat{\jmath} + 6\hat{k}$

34. Find 'a' such that the vectors $2\hat{\imath} - \hat{\jmath} + \hat{k}$, $\hat{\imath} + 2\hat{\jmath} - 3\hat{k}$ and $3\hat{\imath} + a\hat{\jmath} + 5\hat{k}$ are coplanar:
(a)-4 (b)4 (c)-2 (d)2

35. Weights of 1gm, 2gm,..... 100 gm are hanging at, marks 1, 2,..... 100 of a meter-scale. The scale will be balanced at the point marked as:
(a)50 (b)60 (c)65 (d)67

36. A body of weight 4 kg rests in limiting equilibrium on an inclined plane whose slope is 30°. The normal reactions and co-efficient of frictions are, respectively:
(a)$2\sqrt{3}\,kg, \frac{1}{\sqrt{3}}$ (b) $2\sqrt{3}\,kg, \frac{1}{\sqrt{3}}$
(c) $3\sqrt{2}\,kg, \frac{1}{\sqrt{3}}$ (d) $3\sqrt{2}\,kg, \frac{1}{\sqrt{2}}$

37. The semi-vertical angle of cone of friction is 30°. The co-efficient of friction is:
(a) $\frac{1}{\sqrt{3}}$ (b) $\frac{1}{\sqrt{2}}$ (c) $\frac{\sqrt{3}}{2}$ (d) $\frac{1}{3}$

38. A uniform rod rests entirely with in a smooth spherical bowl. Its inclination to the horizontal is:
(a) 0° (b) 30° (c) 35° (d) 45°

39. A body travelling along a straight line traversed one-third the distance with a velocity of m/s. The remaining part of the distance was covered with velocity 3 m//s for half the time and with velocity 2 m/s for the other half of the time. The average velocity of the body over the whole time of motion will be:
(a)2 m/s (b)2.5 m/s (c)3 m/s (d)5 m/s

40. A projectile is thrown with an initial velocity $\bar{v} = (p\hat{\imath} + q\hat{\jmath})$ m/s. If the range of the projectile is double the maximum height reached by it, then:
(a)p=2q (b)q=4p (c)q=2p (d)q=p

41. The position of a particle x (in meters) at a time t second is given by the relation:
$$\bar{r} = 3 + \hat{\imath} - t^2\hat{\jmath} + 4\hat{k}$$
The magnitude of velocity (in m/s) of the particle after 5 seconds is:
(a) $\sqrt{102}$ (b) $\sqrt{109}$ (c) $\sqrt{110}$ (d) $\sqrt{102}$

42. If $\frac{1}{b+c}, \frac{1}{c+a}, \frac{1}{a+b}$ are in AP. Then:
(a)a, b, c are in AP (b)a, b, c are in HP
(c) a^2, b^2, c^2 are in AP (d) $\frac{1}{a}, \frac{1}{b}, \frac{1}{c}$ are in AP

43. If $\frac{1}{1^2} + \frac{1}{2^2} + \frac{1}{3^2} + \ldots = \frac{\pi^2}{6}$, then $\frac{1}{1^2} + \frac{1}{3^2} + \frac{1}{5^2} + \ldots$. equals:
(a) $\frac{\pi^2}{8}$ (b) $\frac{\pi^2}{9}$ (c) $\frac{\pi^2}{12}$ (d) $\frac{\pi^2}{18}$

44. If s = 1 + a + a^2 +....., (a<1), the a = ?
(a) $\frac{s}{s-1}$ (b) $\frac{s}{1-s}$ (c) $\frac{s-1}{s}$ (d) $\frac{1-s}{s}$

45. The sum of integers from 1 to 60 that are divisible by 2 or 3 is:
(a)330 (b)1230 (c)1560 (d)1830

46. The fifth, tenth and fifteenth terms of a GP are p, q, r respectively. Then:
(a) $p^2 = qr$ (b) $q^2 = pr$ (c) $r^2 = pq$ (d) $pqr = 1$

47. The sum of n terms of $\frac{1}{2} + \frac{3}{4} + \frac{7}{8} + \frac{15}{16} + \ldots$. is:
(a)n + $2^n - 1$ (b) n + $2^{-n} - 1$
(c) n - $2^{-2} - 1$ (d) n - $2^n - 1$

48. The value of $\sum_{r=1}^{n} \frac{{}^nP_r}{r!}$ is:
(a) 2^{n-1} (b) 2^n (c) $2^n - 1$ (d) $2^{n-1} + 1$

49. The sum of the digits in the unit place of all the four digit numbers formed with 2, 3, 4, 5 taken all at a time, is:
(a)14 (b)42 (c)84 (d)336

50. The area of the figure bounded by the curves y = e^x, e^{-x} and the straight line x = 1 is:
(a) $e + e^{-1}$ (b) $e + e^{-1} - 2$ (c) $e + e^{-1} - 1$ (d) $e - e^{-1} + 1$

51. The orthocenter of the triangle formed by x = 3, y = 4 and 4x + 3y = 12 is at the point:
(a(3, 0) (b)(0, 4) (c)$\left(\frac{3}{2}, 2\right)$ (d)(3, 4)

52. The lines represented by the equation $Ax^2 + 2Bxy + Cy^2 = 0$ are perpendicular, if:
(a)A + B = 0 (b)A + C = 0
(c)B + C = 0 (d)AC = -1
53. The medians AD, and BE of the triangle ABC with vertices A (0, b), B(0, 0) and C(a, 0) are mutually perpendicular is:
(a)a = b (b)ab = -1 (c)a = $\pm\sqrt{2}b$ (d) b = $\pm\sqrt{2}a$
54. The circle $x^2 + y^2 - 4x - 6y - 12 = 0$ cuts an intercept on x-axis of length:
(a)8 (b)6 (c)4 (d)2
55. The circles $x^2 + y^2 = 1$ and $x^2 + y^2 - 2x - 2y - 1 = 0$:
(a)do not intersect
(b)touch internally
(c)touch externally
(d)intersect at two points
56. The vertex of the parabola $y^2 + 6x - 2y + 13 = 0$ is:
(a)(-2, -1) (b) (-2, 1) (c) (2, -1) (d) (2, 1)
57. If (a, 1) is the mid-point of a chord passing through the vertex of the parabola $y^2 = 4x$, then:
(a)2a = 1 (b)a = 1 (c)a = 2 (d) $a^2 = 1$
58. P is a variable point on the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ with AA' as the major axis. Then the maximum value of the area of the triangle APA' is:
(a) $\frac{1}{2}ab$ (b)ab (c)2ab (d)None of these
59. The line x =at^2 meets the ellipse at real points if, and only if:
(a)$|t| \leq 1$ (b) $|t| \leq 2$ (c) $|t| \geq 2$ (d) $|t| \geq 1$
60. If x = 5 is the chord of contact of the hyperbola $x^2 - y^2 = a$, then the equation of the corresponding pair of tangents is:
(a) $25x^2 - 16y^2 - 90x - 81 = 0$
(b) $25x^2 - 16y^2 - 90x + 81 = 0$
(c) $25x^2 - 16y^2 + 90x + 81 = 0$
(d) $25x^2 - 16y^2 + 90x - 81 = 0$
61. The ASCH is a:
(a)7 bit code (b)12 bit code
(c)4 cit code (d)6 bit code
62. Which is the correct sequence of steps in the operation of a basic computer?
(a)Fetch, execute, decode
(b)Fetch, decode, execute
(c)Decode, fetch, execute
(d)Execute, decode, fetch
63. The contents of an 8- bit register|||| ||||. If the represented number is in signed- 1's complement form, the decimal equivalent of the number is:
(a)-127 (b)127 (c)128 (d)-0
64. USB stands for:
(a)Universal Standard Bus
(b)Universal Serial Bus
(c)Unified Standard BUs
(d)Uniform Serial Bus
65. Level 1 cache is a form of:
(a)processor (b)Input device
(c)output device (s)memory
66. The number of bits required to encode 30 pieces of information is
(a)4 (b)5 (c)6 (d)7
67. Which of the following is not a valid library function in the C programming language?
(a)peek ( ) (b)poke ( )
(c)atoc ( ) (d)malloc ( )
68. What is the output of the following C-program?
include <stdio.h>
Void main ( )
{
Char letter= 'z'
Print f(''\n%c'', letter);
}
(a)z (b)90
(c)Error (d)Garbage value
69. Specify the output of the following C-program:
#include<stdio.h>
Void main( )
{
Int a = 10, b = 20;
Char x = 1, y =0;
If (a, b, x, y)
{
Print f("EXAM");
}
}
(a)AM is printed (b)EXA is printed
(c)Compile error (d)None of the above
70. Hexadecimal equivalent of Octal 1217 is:
(a)1217 (b)028F (c)2297 (d)OB17
71. In a certain code language 'COMPUTRONE' is written as 'PMOCTUENOR'. How is 'ADVATNSAGE' written in the same code?
(a)IDUJLAIC (b)AVDATNSEGA
(c)ADVATNSAGE (d)AVDANTSEGA
72. If CAT=12 then MAN=?
(a)14 (b)24 (c)16 (d)None of these
73. If 'Lily' is called 'Lotus', 'Lotus', is called 'Rose', ROSE is called 'Sunflower' and sunflower is called 'Marigold', then which will be the national flower of India?
(a)Lily (b)Lotus (c)Rose (d)Marigold
Direction(Q no. 74-76): In each of the following questions, there is certain relationship between two given words on one side of ": :" and one word is given on

the other side of it, while another word is to be selected from the given alternative showing the same relationship with the words, as the words of the given pair bear. Choose the correct alternatives:

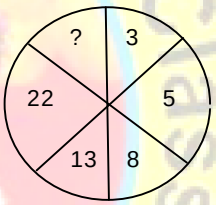
74. Malaria : Disease : : Spear :?
(a)Wound (b)Sword (c)Weapon (d)Death
75. Food : Stomach : : Fuel : ?
(a)Engine (b)Plane(c)Truck (d)Automobile
76. Five : Ashes : : Explosion : ?
(a)Flame (b)Death (c)Sound (d)Debris

Directions (Q no 77-83): The following questions consist of two words that have certain relationship between each other, followed by four letter pairs of words. Select the related pair that has the same relationship as the original pair of words:

77. Fodder : Cattle : : ?
(a)Pen : Ink (b)Ball : Stick
(c)Fruit : Juice (d)Grass : Horse
78. Horse : Hoof : : ?
(a)Man : Foot (b)Dog : Black
(c)Paise : Rupee (d)Pen : Pencil
79. Sailor : Compass : : ?
(a)Student : Exam (b)Doctor : Stethoscope
(c)Pen : Officer (d)Painter : Artist
80. Cells : Cytology : : ?
(a)Worms : Ornithology (b)Insects : Entomology
(c)Diseases : Physiology (d)Tissues : Morphology
81. Sin : Crime : : ?
(a)Man : Animal (b)Home : Court
(c)Morality : Legality (d)Jury : Priest
82. Man : Mammal : : ?
(a)Liberty : : literate (b)Hail : Snow
(c)Native : Inhabitant (d)Offspring : Family
83. Spring : Elasticily : : ?
(a)Persons : Whims (b)Wool :Warmth
(c)Marketing : Advertising (d)Radio : Broadcast

Directions : (Q no. 84-90): In each of the following questions four pair of words are given, out of these words one pair does not bear the common relationship which rest bear. You are required to find that odd pair.

84. (a) Needle – Prick (b) Gun- Fire
(c)Auger-Bore (d)Chisel- Carve
85. (a) Lion-Roar (b) Snake-Hiss
(c)Bees-Hum (d)Frog- Bleat
86. (a) Dim-Bright (b) Wrong-Right
(c)Shallow-Deep (d)Genuine-Real
87. (a) Oil-Lamp (b) Water-Tap
(c)Oxygen-Life (d)Chisel- Carve
88. (a) Needle – Prick (b) Gun- Fire
(c)Auger-Bore (d)Chisel- Carve
89. (a)Captain-Team (b)Boss-Gang
(c)Chief Minister-Cabinet (d)Artist-Troupe
90. (a)Hard-Soft (b)Pointed-Blunt
(c)Sweet-Soar (d)Long-High
91. A man starts from a point 'X' and walks 3 km southwards, then he turns left and walks 6 km. In which direction is he from the starting point?
(a)South-West (b)South-East
(c)West (d)South
92. Ram and Shyam start walking in opposite directions. Ram covers 6 km and Shyam 8 km. Then Ram truns right and walks 8 km and Shyam turns Left and walks 6 km. How far everyone is from the starting point?
93. If 18th February, 2009 is a Friday, then what will be the day of 18th February, 2011?
(a)Sunday (b)Monday
(c)Tuesday (d)Wednesday
94. Which number, in the given series, is wrong?
160, 118, 83, 65, 34, 20
(a)83 (b)118 (c)34 (d)65
95. Find the missing number in the following:



(a)1 (b)26 (c)39 (d)45
96. If (i) ' A-B' means ' A is father of B'
(ii) 'A+B' means ' A is daughter of B'
(iii) 'A÷ B' means ' A is son of B'
(iv) 'A× B' means ' A is wife of B'
Which of the following means P is grandson of S?
(a) $P + Q - S$ (b) $P \div Q \times S$ (c) $P \div Q \div S$ (d) $P \times Q \div S$
97. Today is Monday. After 61 days, it will be:
(a) Wednesday (b) Saturday
(c) Tuesday (d) Thursday
98. Consider the statement: A = B C $\geq D = E \leq F$
Conclusions $I: F > B$
$II. B \geq D$
In your opinion :
(a)Only conclusion I follows
(b)Only conclusion II follows
(c)Either conclusion I or II follows
(d)Neither conclusion I nor II follows
99. Consider the statement: Imprisonment for 27 years made Nelson Mandela the President. Assumptions
I. Only who will be imprisoned for 27 years will become the President.

II. To become the President, imprisonment is a qualification. In your opinion:
(a)Only Assumption I is implicit
(b)Only Assumption II is implicit
(c)Either I or II is implicit
(d)Neither I nor II is implicit

100. How many times are the hands of a clock at right angle in a day?
(a)22 (b)24 (c)44 (d)48

101. Karl Pearson's coefficient of skewness is given by:
(a) $\frac{AM-Median}{SD}$ (b) $\frac{AM-Mode}{SD}$
(c) $\frac{Median-Mode}{SD}$ (d) $\frac{AM-Mode}{Median}$

102. If standard deviation of $\{x_1, x_2, \dots x_n\}$ is S, then the standard deviation of $\{1-2x_1, 1-2x_2, \dots, 1-2x_n\}$ is equal to
(a) $1-2S$ (b)-2S (c)2S (d)1-S

103. If X and Y are two variables such that $SD(X+Y) \geq SD(X-Y)$ then:
(a) $-1 \leq r(X,Y) \leq 0$ (b) $0 \leq r(X,Y) \leq 1$
(c) $r(X,Y) = 0$ (d) $r(X,Y) = \pm 1$

104. If two lines of regression of Y on X and X on Y are respectively $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$,then
(a) $a_1a_2 \leq b_1b_2$ (b) $a_1b_2 \leq a_2b_1$
(c) $a_1b_2 \geq a_2b_1$ (d) $a_1a_2 \geq b_1b_2$

105. For any two events A and B, the probability that exactly one of the two events occurs, is given by:
(a)P(A) + P (B) – P (A∩B)
(b)P(A) + P (B) – 2P (A∩B)
(c)1 – P(A ∩ B) (d) 1 – P(A ∪ B)

106. A fair coin is tossed repeatedly. If head appears in first four tosses, then the probability of head appearing in the fifth toss is :
(a)$\frac{1}{32}$ (b) $\frac{1}{5}$ (c) $\frac{1}{2}$ (d) $\frac{31}{32}$

107. Consider the LPP: Minimize Z = 3x + 5y
Subject to $x \geq 3; y \geq 1; 2x + y \geq 5$
Redundant constraint in this Lpp is:
(a)$2x + y \geq 5$ (b)$y \geq 1$ (c) $x \geq 3$ (d)None of these

108. Solve the LPP:
Maximize $Z = 2x + 3y$
Subject to $X \leq 3; y \leq 3; x + y \leq 5; x, y \geq 0$
What do you find?
(a)Optimal solution is at $x = 2, y = 3$; Maximum value of $Z = 12$
(b)Optimal solution is at $x = 3, y = 2$; Maximum value of Z=12
(c)Optimal solution is at x = 3, y=2 ; Maximum value of Z = 13
(d)Optimal solution is at x = 2, y = 3; Maximum value of Z = 13

109. If sets A and B are defined as:
A = $\{(x,y)\}\ y = e^x,\ x \in R\}$
B = $\{(x,y)\}\ y = x,\ x \in R\}$ then:
(a)A ⊂ B (b) $B \subset A$ (c)A∩ $B = \phi$ (d)A∪B=A

110. In a battle 71% of the combatants lost and eye, 82% an ear, 74% an arm and 83% a leg. If x% lost all the four limbs, then the minimum value of x:
(a)can not be determined (b)10
(c)71 (d)None of these

111. If tan θ tan 2 θ=1, then θ =?
(a) $n\pi + \frac{\pi}{6}$ (b) $n\pi \pm \frac{\pi}{6}$
(c) $2n\pi \pm \frac{\pi}{6}$ (d) $2n\pi + \frac{\pi}{6}$

112. If sin x + sin 3x + sin 5x = 0, then the value of x such that $0 < x \leq \frac{\pi}{2}$ is:
(a) $\frac{\pi}{12}$ (b) $\frac{\pi}{6}$ (c) $\frac{\pi}{4}$ (d) $\frac{\pi}{3}$

113. The equation a cos x + b sin x = c where $|c| > \sqrt{a^2 + b^2}$ has :
(a)no solution
(b)a unique solution
(c)two solutions
(d)an infinite number of solutions

114. The domain of sin^{-1} *is*:
(a) $(-1,1)$ (b) $(-\pi,\pi)$ (c) $(0,2\pi)$ (d) $(-\infty,\infty)$

115. $sin^{-1}\left(\frac{1}{4}\right) + tan^{-1}\left(\frac{2}{9}\right)$ =?
(a) $tan^{-1}\left(\frac{1}{18}\right)$ (b) $tan^{-1}\left(\frac{17}{36}\right)$
(c) $tan^{-1}\left(\frac{1}{2}\right)$ (d) $\left(\frac{1}{2}\right) tan^{-1}\left(\frac{3}{5}\right)$

116. If the sides of a triangle are 7 cm, $4\sqrt{3}$ cm and $\sqrt{13}$ cm respectively, then the smallest angle is:
(a)15° (b) 30° (c) 45° (d) 60°

117. If b = 3, c = 4,$\angle B = \frac{\pi}{3}$, then the number of triangle that may be constructed is:
(a)0 (b)1 (c)2 (d)Infinite

118. The angle of elevation of the top of an incomplete vertical pillar at a horizontal distance of 50 mt, from its base is 45°. If the angle of elevation of the complete pillar at the same point is to be 60°, then the height of the incomplete pillar is to be increased by:
(a)25 mt (b)50($\sqrt{3}$-1) mt
(c)50 mt (d) 50($\sqrt{3}$+1) mt

119. If every pair from the equations $x^2 + px + qr = 0$; $x^2 + qx + pr = 0$ and $x^2 + rx + pq = 0$ has a common root, then the product of the three common roots is:
(a)$\sqrt{pqr}$ (b)pqr (c) $p^2q^2r^2$ (d)2 pqr

120. The value of $\sqrt{8 + 2\sqrt{8 + 2\sqrt{8 + 2\sqrt{\dots}}}}$
(a)4 (b)6 (c)8 (d)10

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121. The number of real roots of the equation: $|x|^2$-5$|x|$ + 4 = 0, is:
(a)1 (b)2 (c)3 (d)4

122. If the ratio of the roots of $x^2 + bx + c = 0$ amd $x^2 + qx + r = 0$ be the same, then:
(a) b^2q=cr^2 (b) $b^2r = q^2c$ (c) $bq = cr$ (d) $br = cq$

123. The number of roots of the equation:
$9sec^2\theta$-9 $sec\theta$ + 2 = 0, is
(a)0 (b)1 (c)2 (d)4

124. There are 4 letters and 4 directed envelops. The number of ways all the letters are placed in a wrong envelope is:
(a)6 (b)8 (c)9 (d)12
(a)6 (b)8 (c)9 (d)12$\frac{1}{x+1}$

125. Four men and four women are to sit around a circular table such that there is a man on either side of every woman. The number of seating arrangements is:
(a)3! × 4! (b) (3!)^2 (c) (4!)^2 (d) 2(3!)^2

126. If the sum of the co- efficients in the expansion of $(a + b)^n$ is 1024 then the largest coefficient in the expansion is:
(a)84 (b)126 (c)168 (d)252

127. Consider the following statements:
A: Matrix multiplication is associative
B: Matrix multiplication is not commutative, in general.
C: Product of two matrices may be a null matrix, while neither of them is a null matrix.
In your opinion:
(a)A is incorrect (b)B is incorrect
(c)C is incorrect (d)All the three statements are correct

128. From the matrix equation AB=AC we can conclude B = C provided A is:
(a)Singular (b)Non-singular
(c)Symmetric (d)Square

129. Consider the following statements:
$A = \lim_{x\to 0}(1 + \lambda x)^{1/x} = e^{\lambda}$;
$B = \lim_{x\to\infty}\left(1 + \frac{\lambda}{x}\right)^{x} = e^{-x}$.
In your opinion:
(a) Only A is correct
(b)Only B is correct
(c)Both A and B are correct
(d)Both A and B are incorrect

130. If $x^y = a^b, a, b$ being constants, then $\frac{dy}{dx}$ =?
(a)$\frac{y}{x\,log\,x}$ (b) $\frac{ylogx}{x}$ (c)$-\frac{y}{x\,logx}$ (d) $\frac{x}{y\,log\,x}$

131. If $tan^{-1}4x + tan^{-1}6x = \frac{\pi}{4}$, then x equal to:
(a) $\frac{1}{12}$ (b)$-\frac{1}{2}$ (c) $-\frac{1}{12}$ (d)None of these

132. If μ is the coefficient of friction between two bodies in contact, then:
(a)$0 \le \mu \le 1$ (b) $-1 \le \mu \le 1$
(c)$-\frac{1}{2} \le \mu \le \frac{1}{2}$ (d) $\mu > 1$

133. For $2 \le r \le n$, $^nC_r + 2\,{}^nC_{r-1} + {}^nC_{r-2}$=?
(a) $^{n+1}C_{r-1}$ (b) $^{2n+1}C_{r+1}$
(c)2 $^{n+2}C_r$ (d) $^{n+2}C_r$

134. If $f(x) = \frac{x-1}{x+2}$, then $f(2x)$ is:
(a) $\frac{f(x)+1}{f(x)+3}$ (b) $\frac{3f(x)+1}{f(x)+3}$
(c) $\frac{f(x)+3}{f(x)+1}$ (d) $\frac{f(x+1)}{f(x)+3}$

135. The line x + y = 6 is normal to the parabola $y^2 = 8x$ at the point:
(a) (4,2) (b) (2,4) (c) (2,2) (d) (3,3)

136. The largest revenue source in India is:
(a)Railways (b)Sales Tax (c) Excise Duty (d) Direct Tax

137. Which of the following is not provided in the Constitution of India?
(a)Election Commission
(b)Finance Commission
(c)Public service Commission
(d)Planning Commission

138. Which of the following cities is known as the commercial capital of India?
(a)New Delhi (b) Kolkata (c) Chennai (d) Mumbai

139. Who founded the Bharatiya Janasangh ?
(a)Dr. Shyama Prasad Mukherjee
(b)Deen Dayal Upadhyaya
(c)Veer Savarkar
(d)Atal Vehari Vajpayee

140. Tides in sea are coused by:
(a)Effect of Sun
(b)Effect of Moon
(c) Combined effect of Sun and Moon
(d)Gravitational, centripetal and centrifugal forces

141. Polio myelitus is a type of:
(a)bacterial disease (b)viral disease
(c)fungal disease (d)none of these

142. Who is the present Governor of Reserve Bank of India?
(a)D. Subbarao (b)C. Rangarajan
(c)Raghuram Rajan (d)Osborne Smith

143. What is the name of the first antibiotic discovered?
(a)Pennicilin (b)Streptomycin
(c) Actinomycin (d)Tetracycline

144. The next Common Wealth Games will be held in:
(a)Edinburgh (b)Kuala Lumpur
(c)Glasgow (d)Gold Coast

145. The president of India can be removed from his office by the:

(a)Prime Minister (b)Lok Sabha
(c)Chief Justice of India (d)Parliament

146. Fill in the blanks by selecting one from the given alternatives: " Ram, you can call me.....Mondya.....3 O'clock.....the after noon."

147. What is the synonym of ' Crucial'?
(a)Active (b)Dependent
(c)Extremely important (d)Reserve

148. "Birds of same.....flock together." Fill in the blank from the given alternatives:
(a)feather (b)colour (c)group (d)foreign

149. "My best friend, John, is named..... his grandfather". Fill in the gap by the appropriate alternative:
(a)to (b)about (c)after (d)on

150. Fill in the gap by the alternatives:
"I told you about the incident yesterday,.....I."
(a)didn't (b)don't (c)do (d)did