

BHU – 2020

Objective Type Questions (Only one option is correct)

1. The equation of the circle passing through the origin which cuts off intercepts of length 6 and 8 from the x and y-axes respectively is:

- (a) $x^2 + y^2 + 6x - 12y = 0$ (b) $x^2 + y^2 + 12x + 16y = 0$
 (c) $x^2 + y^2 - 6x - 8y = 0$ (d) $x^2 + y^2 - 6x + 16y = 0$

2. Let $f(x) = |x - 1|$, then :

- (a) $f(x^2) = \{f(x)\}^2$ (b) None of these (c) $f(|x|) = |f(x)|$ (d) $f(x + y) = f(x) + f(y)$

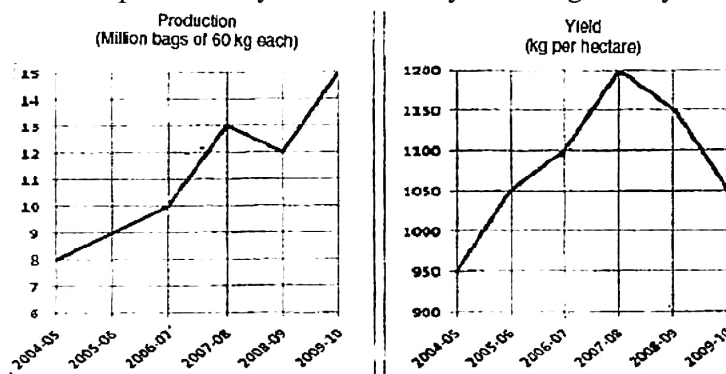
3. If x, y, z are non-zero and $\begin{vmatrix} 1+x & 1 & 1 \\ 1 & 1+y & 1 \\ 1 & 1 & 1+z \end{vmatrix} = 0$, then $x^{-1} + y^{-1} + z^{-1}$ is equal to:

- (a) xyz (b) $\frac{-1}{xyz}$ (c) $x + y + z$ (d) -1

4. If $\frac{1}{b+c}, \frac{1}{c+a}, \frac{1}{a+b}$ are in A.P. then

- (a) None of these (b) a, b, c are in A. P. (c) $\frac{1}{a}, \frac{1}{b}, \frac{1}{c}$ are in A.P. (d) a^2, b^2, c^2 are in A. P.

5. The trends in production and productivity of Rice for 6 years are given by following charts.



In which year highest increase in productivity was observed as compared to its previous year?

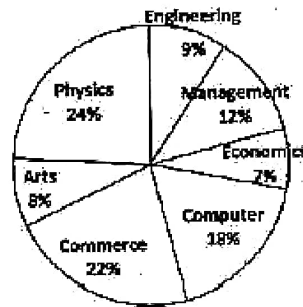
- (a) 2004-05 (b) 2006-07 (c) 2005-06 (d) 2007-08

6. The set of solution of an inequality $\left|x + \frac{1}{4}\right| > \frac{7}{4}$, is:

- (a) $x \in \left(-2, \frac{3}{2}\right)$ (b) $x \in (-\infty, 2) \cup \left(\frac{5}{2}, \infty\right)$ (c) $x \in (-2, \infty)$ (d) $x \in (-\infty, -2) \cup \left(\frac{3}{2}, \infty\right)$

7. The following chart shows the percentage distribution of students of a university in different subjects. Total number of student registered in commerce is 1056.

Percentage of students in different subjects in the university



Which of the following sequence shows the increasing order of subjects according to number of enrollment?

- (a) Arts, Physics, Economics, Management (b) Physics, Computer, Engineering, Economics
 (c) Economics, Commerce, Physics, Computer, Arts (d) Economics, Engineering, Computer, Physics

8. The p^{th} , q^{th} and r^{th} terms of an A. P. as well as those of a G. P. are a , b , c respectively. The value of $a^{b-c} \times b^{c-a} \times c^{a-b}$ is equal to:

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

9. Given $f(x) = \log\left(\frac{1+x}{1-x}\right)$ and $g(x) = \frac{3x+x^3}{1+3x^2}$ then $f \circ g(x)$ equals:

- (a) $3f(x)$ (b) $-f(x)$ (c) None of these (d) $\{f(x)\}^3$

10. The angle between the lines $2x^2 - 7xy + 3y^2 = 0$ is:

- (a) 60° (b) 45° (c) 30° (d) $\tan^{-1}\left(\frac{7}{6}\right)$

11. The argument of $\frac{1-i\sqrt{3}}{1+i\sqrt{3}}$ is

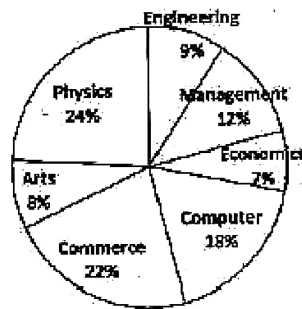
- (a) $\frac{2\pi}{3}$ (b) $\frac{7\pi}{6}$ (c) $\frac{4\pi}{3}$ (d) $\frac{\pi}{3}$

12. If both the roots of the equation $ax^2 + bx + c = 0$ are zero, then:

- (a) $b = 0, c \neq 0$ (b) $b, c = 0$ (c) $b \neq 0, c \neq 0$ (d) $b \neq 0, c = 0$

13. The following chart shows the percentage distribution of students of a university in different subjects. Total number of student registered in commerce is 1056.

Percentage of students in different subjects in the university



Total number of subjects registered in finance related subjects is:

- (a) 1969 (b) 2248 (c) 2500 (d) 576

14. Which one is the better offer?

Three successive discounts of 10%, 10% and 30% or three successive discounts of 40%, 5% and 5%?

- (a) Second offer is better (b) Insufficient information (c) First offer is better (d) Both are similar

15. If the system of equation $a + 4ay + az = 0$, $x + 3by + bz = 0$, $x + 2cy + cz = 0$ have a non-zero solution, then $a, b, c (\neq 0)$ are in”

- (a) A.P. (b) G.P. (c) H.P. (d) a, b, c are not in any sequence

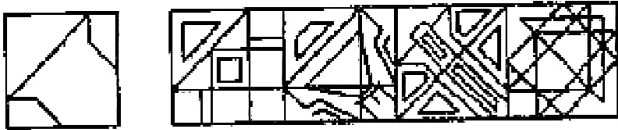
16. If $x^2 - kxy + y^2 + 2y + 2 = 0$ denotes a pair of straight lines then $k =$

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

17. If $A = \begin{bmatrix} 3 & 2 \\ 1 & 1 \end{bmatrix}$ and $A^2 + aA + bI = 0$, then values of ‘a’ and ‘b’ are

- (a) $a = 4, b = 23$ (b) $a = -3, b = 2$ (c) $a = -4, b = 1$ (d) $a = -2, b = -5$

18. Find out the alternative figure which contains figure (X) as its part:



(X) (1) (2) (3) (4)

- (a) 1 (b) 3 (c) 2 (d) 4

19. How many three digit number are divisible by 7?

- (a) 127 (b) 128 (c) 125 (d) 126

20. Which of the following relations on R is an equivalence relation?

- (a) $xR_1y \Leftrightarrow |x| = |y|$ (b) $xR_3y \Leftrightarrow \frac{x}{y}$ (c) $xR_2y \Leftrightarrow x \geq y$ (d) None of these

21. The volume of spherical balloon is increasing at rate of $20 \text{ cm}^3/\text{sec}$. The rate of change of its surface area at the instant when its radius is 8 cm, is given by

- (a) $\frac{8\pi}{5} \text{ cm}^2 / \text{sec}$ (b) $8 \text{ cm}^2 / \text{sec}$ (c) $5 \text{ cm}^2 / \text{sec}$ (d) $8\pi \text{ cm}^2 / \text{sec}$

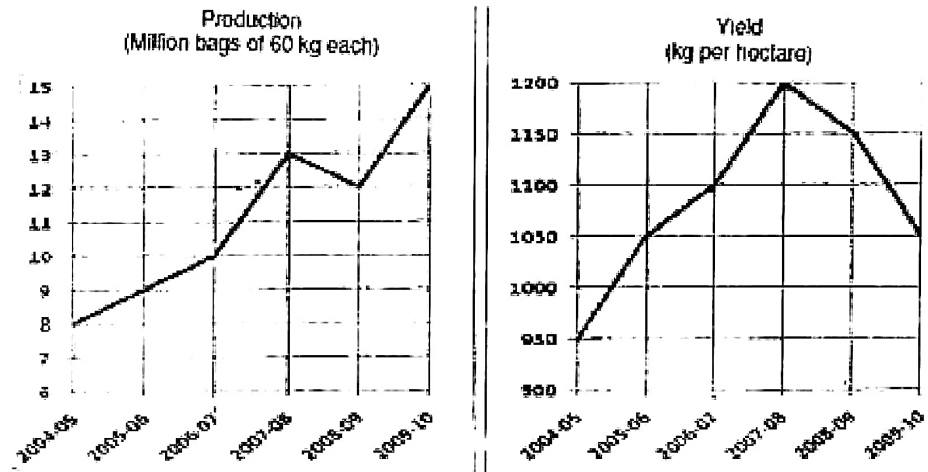
22. The orthocenter of the triangle formed by the lines $xy = 0$ and $x + y = 1$ is:
 (a) $\left(\frac{1}{2}, \frac{1}{2}\right)$ (b) $(0, 0)$ (c) $\left(\frac{1}{4}, \frac{1}{4}\right)$ (d) $\left(\frac{1}{3}, \frac{1}{3}\right)$
23. The smallest value of x satisfying the inequality ${}^{10}C_{x-1} > 2 \cdot {}^{10}C_x$ is:
 (a) 8 (b) 9 (c) 10 (d) 7
24. If $a^x = b^{2x-3}$, then value of x is ($a > 0, b > 0$ and $a, b \in \mathbb{R}$)
 (a) $\frac{3 \log b}{(2 \log b - \log a)}$ (b) $\frac{a^2}{b^3}$ (c) $\frac{b^3}{a^2}$ (d) $\frac{\log b}{(\log b - 2 \log a)}$
25. If $\frac{1}{x-3} - \frac{1}{x+5} = \frac{1}{6}$, $x \neq 3$ and $x \neq -5$, then value of x is:
 (a) 11; -9 (b) -11; 9 (c) 7; -9 (d) -7; 8
26. A man can row upstream at 6km/hr and downstream at 10 km/hr. Find speed of stream:
 (a) 2 km/hr (b) 1 km/hr (c) 3 km/hr (d) 4 km/hr
27. On selling an article for Rs. 48, one loses 20%. In order to gain 20% what would be the selling price?
 (a) Rs. 74 (b) Rs. 76 (c) Rs. 78 (d) Rs. 72
28. The only root of the equation $9 \log_3(\log_2 x) = \log_2 x - (\log_2 x)^2 + 1$ is:
 (a) $x = 1$ (b) $x = 4$ (c) $x = 3$ (d) $x = 2$
29. Rahul put his timepiece on the table in such a way that at 6 P.M. hour hand points to North. In which direction the minute hand will point at 9:15 P.M.
 (a) South-East (b) West (c) North (d) South
30. If $f(x) = \sin^{-1}\left(\frac{2x}{1+x^2}\right)$ then $f(x)$ is differentiable on:
 (a) $[-1, 1]$ (b) $\mathbb{R} - [-1, 1]$ (c) None of these (d) $\mathbb{R} - \{1, -1\}$
31. If $f: \mathbb{R}_+ \rightarrow [-5, \infty)$ and $f(x) = 9x^2 + 6x - 5$, f is invertible, then $f^{-1}(y)$ is equal to:
 (a) $f^{-1}(y) = \frac{\sqrt{5+3}}{3}$ (b) $f^{-1}(y) = \frac{\sqrt{y+5}}{9}$ (c) $f^{-1}(y) = \frac{(\sqrt{y+6})-1}{3}$ (d) $f^{-1}(y) = -\left(\frac{\sqrt{y+5}-1}{9}\right)$
32. Determine b satisfying $\log_{\sqrt{8}} b = 3\frac{1}{3}$:
 (a) 32 (b) 24 (c) 16 (d) 40
33. If the cost price of 4 things be equal to the sale price of 3 things, then profit present is:
 (a) 25% (b) 40% (c) $33\frac{1}{3}\%$ (d) $37\frac{1}{2}\%$

34. Let R is a relation from $\{11, 12, 13\}$ to $\{8, 10, 12\}$ defined by $y = x - 3$, then R^{-1}
 (a) None of these (b) $\{(10, 13), (8, 11)\}$ (c) $\{(11, 8), (13, 10)\}$ (d) $\{(8, 11), (10, 13)\}$

35. If $z = \frac{i-1}{\cos \frac{\pi}{3} + i \sin \frac{\pi}{3}}$ then polar form of z is:
 (a) $\sqrt{2} \left(\cos \frac{5\pi}{12} + i \sin \frac{5\pi}{12} \right)$ (b) $\frac{1}{2} \left(\cos \frac{3\pi}{4} + i \sin \frac{3\pi}{4} \right)$ (c) $\sqrt{2} \left(\cos \frac{3\pi}{4} + i \sin \frac{3\pi}{4} \right)$ (d) $\frac{1}{2} \left(\cos \frac{\pi}{3} + i \sin \frac{\pi}{3} \right)$

36. If ω is a cube root of unit and $\omega \neq 1$, then value of $\begin{vmatrix} 1 & \omega & \omega^2 \\ \omega & \omega^2 & 1 \\ \omega^2 & 1 & \omega \end{vmatrix}$ is equal to:
 (a) 2 (b) 1 (c) 0 (d) -1

37. The trends in Production and Productivity of Rice for 6 years are given by following charts.



The approximate decrease present in rice cultivation area from the year 2007-08 to 2008-09 was.
 (a) 8% (b) 2% (c) 4% (d) 9%

38. For the set $A = \{1, 2, 3\}$, R is a relation on the set A as $R = \{(1, 1), (2, 2), (3, 3), (1, 3)\}$ to make it the smallest equivalence relation the ordered pairs to be added is:
 (a) $(3, 2), (2, 3), (3, 1)$ (b) $(3, 2), (2, 3)$ (c) $(3, 2)$ (d) $(3, 1)$

39. If 4-digit numbers be formed using the digits 1, 2, 3, 4 and 5, such that no digit is used more than once in a number, then the number of such even numbers is
 (a) 24 (b) 120 (c) 48 (d) 60

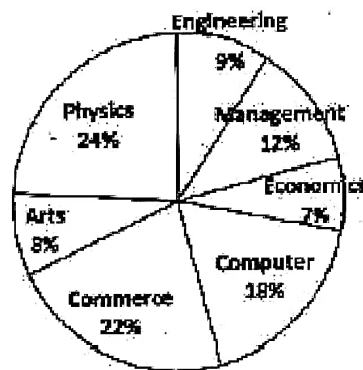
40. If $a + ib = \frac{c+i}{c-i}$, $a, b, c \in \mathbb{R}$, then value of $a^2 + b^2$ is equal to:
 (a) 0 (b) 2 (c) 3 (d) 1

41. If $y = \sqrt{\log x + \sqrt{\log x + \sqrt{\log x + \dots \infty}}}$, then $\frac{dy}{dx}$ is equal to:
 (a) $\frac{1}{x(y+1)}$ (b) $\frac{1}{x(y-1)}$ (c) $\frac{1}{x(2y-1)}$ (d) $\frac{1}{x(2y+1)}$

42. The sides of a triangle are in the ratio $\frac{1}{3} : \frac{1}{4} : \frac{1}{5}$ and its perimeter is 94 cm. The length of the smallest side is
 (a) 23.5 cm (b) 18.8 cm (c) 31.3 cm (d) 24 cm
43. Fill in the blanks:
 ELFA, GLHA, ILJA,, MLNA:
 (a) OLPA (b) KLLA (c) KLMA (d) LLMA
44. The value of $\int_0^{2\pi} \cos^{99} x dx$ is:
 (a) 0 (b) 99 (c) -1 (d) 1
45. The equations of the lines passing through the intersection of lines $4x - 3y - 1 = 0$ and $2x - 5y + 3 = 0$ and equally inclined to the axes, are:
 (a) $x = y; x + y - 2 = 0$ (b) $x + y + 3 = 0; x = y$
 (c) $x + y + 2 = 0; x + y = 0$ (d) $x + y - 3 = 0; 2x + 3y = 0$
46. 250 bananas were divided equally among a certain number of students. If there were 25 more students each would have received half banana less. The number of students is
 (a) 125 (b) 1250 (c) 120 (d) 100
47. The square root of the complex number $(5 + 12i)$ is
 (a) $\pm(3+i)$ (b) $\pm(9+4i)$ (c) $\pm(3+2i)$ (d) $\pm(9+2i)$
48. If $\log_2^x + \log_4^x + \log_8^x = \frac{11}{6}$, then value of x is:
 (a) 8 (b) 2 (c) 4 (d) 1

49. The following chart shows the percentage distribution of students of a university in different subjects.

Percentage of students in different subjects in the university

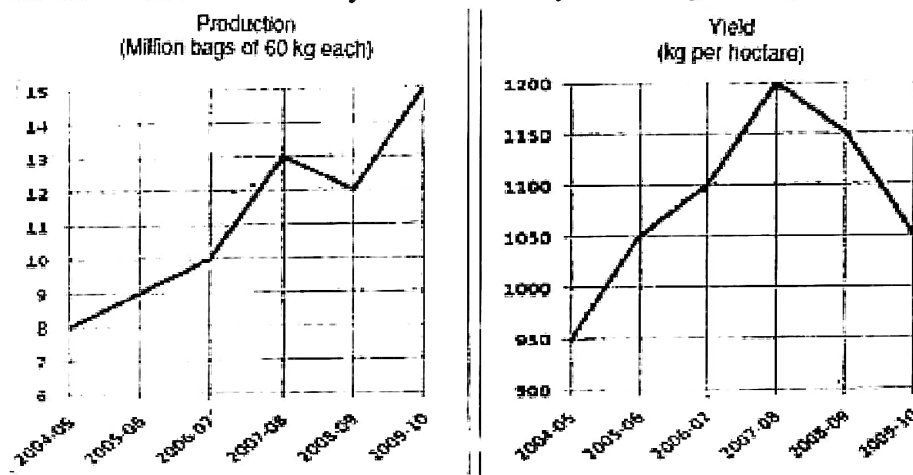


Total number of student registered in commerce is 1056.

- (a) 96 (b) 90 (c) 69 (d) 86
50. If $|Z + \bar{Z}| + |Z - \bar{Z}| = 2$, then Z lies on
 (a) a straight line (b) a square (c) a circle (d) None of these

51. If A and B are two fixed points, then the locus of a point which moves in such a way that angle APB is a right angle is
 (a) an ellipse (b) a circle (c) a parabola (d) a hyperbola
52. Let $R = \{(a, a), (b, b), (c, c), (a, b)\}$ be a relation on set $A = \{a, b, c\}$ then R is
 (a) Identity relation (b) Reflexive (c) Antisymmetric (d) Symmetric
53. If A is any of square matrix of order n, then $A(\text{adj } A)$ is equal to
 (a) 1 (b) $|A| I_n$ (c) $|A|^n$ (d) $|A|^{n-1}$

54. The trends in Production and Productivity of Rice for 6 years are given by following charts.



Average rice production (in kg) during the six years was?

- (a) 670000000 (b) 607000000 (c) 760000000 (d) 706000000

55. Which of the following function is inverse of itself:

- (a) $f(x) = 2^{x(x-1)}$ (b) None of these (c) $f(x) = \frac{1-x}{1+x}$ (d) $f(x) = 5^{\log x}$

56. The area bounded by the straight lines $y = 1$ and $\pm 2x + y = 2$ is:

- (a) $\frac{1}{2}$ sq. unit (b) $\frac{3}{2}$ sq. unit (c) 1 sq. unit (d) 2 sq. unit

57. If z_1 and z_2 are two n^{th} roots of unity, then $\arg\left(\frac{z_1}{z_2}\right)$ is a multiple of:

- (a) None of these (b) $n\pi$ (c) $\frac{3\pi}{n}$ (d) $\frac{2\pi}{n}$

58. If the centre of the ellipse is (0, 0), major axis is y-axis and it is passing through the points (3, 2) and (1, 6) then equation of the ellipse is

- (a) $\frac{x^2}{8} + \frac{y^2}{10} = 1$ (b) $\frac{x^2}{10} + \frac{y^2}{160} = 1$ (c) $\frac{x^2}{100} + \frac{y^2}{320} = 1$ (d) $\frac{x^2}{10} + \frac{y^2}{40} = 1$

59. Out of 40 consecutive integers, two are chosen at random, the probability that their sum is odd, is

- (a) $\frac{1}{2}$ (b) $\frac{20}{39}$ (c) $\frac{14}{29}$ (d) None of these

60. The interval in which the function $y = \frac{x-1}{x^2-3x+3}$ transforms the real line is:

- (a) $(0, \infty)$ (b) $\left[-\frac{1}{3}, 1\right]$ (c) $[0, 1]$ (d) $(-\infty, \infty)$

61. If a, b, c, d are in G.P. and $a^x = b^y = c^z = d^u$, then x, y, z, u are in:

- (a) A.P. (b) H.P. (c) G.P. (d) None of these

62. The modulus of the complex number $\left(\frac{3+2i}{2-5i} + \frac{3-2i}{2+5i}\right)$ is

- (a) $\frac{8}{29}$ (b) $\frac{2\sqrt{2}}{29}$ (c) $2\sqrt{\frac{2}{29}}$ (d) $\frac{2}{5}$

63. ZRYQ : KCJB :: PWOV : ?

- (a) EOFP (b) ELDK (c) GBHA (d) ISJT

64. The least positive integer n for which $\left(\frac{1+i}{1-i}\right)^n$ is real is

- (a) 8 (b) 6 (c) 2 (d) 4

65. Let $f(x) = [x]$ and $g(x) = |x|$, then value of $(g \circ f)\left(\frac{-5}{3}\right) - (f \circ g)\left(\frac{-5}{3}\right)$ is:

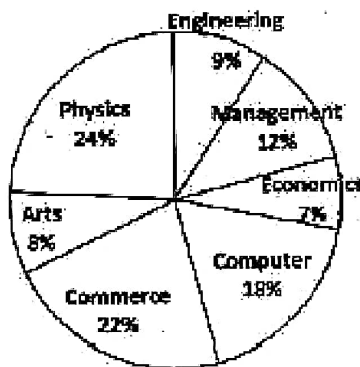
- (a) 3 (b) 1 (c) 0 (d) 2

66. The sum of the first three terms of a G.P. is 16 and the sum of the next three terms is 128. The first terms of the G.P. is

- (a) $\frac{16}{7}$ (b) 8 (c) 16 (d) $\frac{30}{7}$

67. The following chart show the percentage distribution of students of a university in different subjects. Total number of student registered in commerce is 1056

Percentage of students in different subjects in the university



Let sex ratio of enrolled students is 1 : 2 (Female : Male). Number of beds available in university hostel for male is equal to no female resides outside the hostel, what percent of enrolled students residing outside the hostel?

- (a) 30% (b) 35% (c) 50% (d) 33%

68. 8 women can complete a work in 10 days and 10 children take 16 days to complete the same work. How many days will 10 women and 12 children take to complete the work?

- (a) 8 (b) 7 (c) 6 (d) 5

69. Two bus tickets from city A to B and three tickets from city A to C cost Rs. 77 but three tickets from city A to B and two tickets city A to C cost Rs. 73. What are the fares for cities B and C from A?

- (a) Rs 17, Rs 13 (b) Rs. 4, Rs 23 (c) Rs. 15, Rs. 14 (d) Rs. 13, Rs. 17

70. Three numbers are chosen from 1 to 30. The probability that they are not consecutive is:

- (a) None of these (b) $\frac{144}{145}$ (c) $\frac{142}{145}$ (d) $\frac{143}{145}$

71. An integrating factor of the differential equation $\frac{dy}{dx} + y = \frac{1+y}{x}, (x > 0)$ is:

- (a) $\frac{x}{e^x}$ (b) $\frac{e^x}{x}$ (c) xe^x (d) e^x

72. If $A + B$ means A is the brother of B, $A - B$ means A is the sister of B and $A \times B$ means A is the father of B. Which of the following means that C is the son of M?

- (a) $N + M - F \times C$ (b) $M - N \times C + F$ (c) $M \times N - C + F$ (d) $F - C + N \times M$

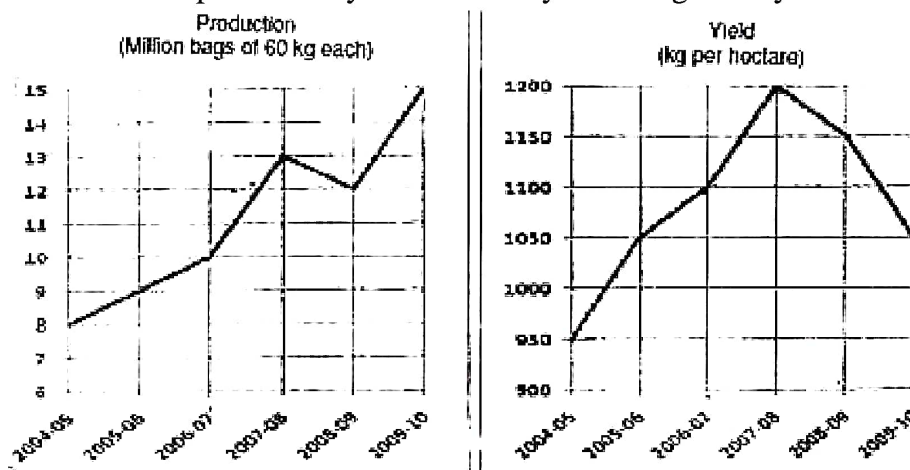
73. The inequality $|2x - x| \leq 1$ is valid when x lies in the interval:

- (a) [1, 2] (b) [-1, 2] (c) (3, 4) (d) (-4, 3)

74. The slope of tangents drawn from a point (4, 10) to the parabola $y^2 = 9x$ are:

- (a) $\frac{1}{4}, \frac{9}{4}$ (b) $\frac{1}{4}, \frac{3}{4}$ (c) $\frac{1}{4}, \frac{3}{4}$ (d) None of these

75. The trends in Production and productivity of rice for 6 years are given by following charts.



Cultivated are (in hectare) of rice in year 2008-09 was:

- (a) 626078 (b) 626080 (c) 626087 (d) 626015

76. The derivative of $\sec^{-1}\left(\frac{1}{2x^2-1}\right)$ with respect to $\sqrt{1-x^2}$ at $x = \frac{1}{2}$ is:

- (a) 2 (b) -2 (c) 4 (d) 1

77. What day of the week was 18th April 1901?

- (a) Monday (b) Wednesday (c) Tuesday (d) Thursday

78. Let $A = \begin{bmatrix} 1 & \sin \theta & 1 \\ -\sin \theta & 1 & \sin \theta \\ -1 & -\sin \theta & 1 \end{bmatrix}$, where $0 < \theta < 2\pi$ then value of $|A|$ is

- (a) $0 < |A| < 4$ (b) $|A| \in [2, \infty)$ (c) $|A| = 0$ (d) $|A| \in [2, 4]$

79. 37% of 150 – 0.05% of 100 = ?

- (a) 50 (b) 55.45 (c) 55.55 (d) 55.5

80. Window is to pane as book is to:

- (a) Novel (b) Glass (c) Page (d) Cover

81. What is the next two numbers of the following sequence?

8, 11, 21, 15, 18, 21, 22,,

- (a) 25, 29 (b) 25, 18 (c) 25, 21 (d) 24, 21

82. In the binomial expansion of $(1+x)^n$, the coefficients of the fifth, sixth and seventh terms are in A.P. the value of n is

- (a) 3, 7 (b) 6, 9 (c) 7, 14 (d) 6, 3

83. $2 : 12 :: 5 : ?$

- (a) 30 (b) 35 (c) 25 (d) 15

84. The eccentric angle of a point on the ellipse $\frac{x^2}{6} + \frac{y^2}{2} = 1$, whose distance from the centre of the ellipse is 2, is:

- (a) $\frac{7\pi}{6}$ (b) $\frac{5\pi}{3}$ (c) $\frac{\pi}{4}$ (d) $\frac{3\pi}{2}$

85. Three dice are thrown, the probability that the same number will appear on each of them is:

- (a) None of these (b) $\frac{1}{18}$ (c) $\frac{1}{6}$ (d) $\frac{1}{36}$

86. If a, b, c are in A. P. as well as in G. P. then:

- (a) $a = b \neq c$ (b) $a \neq b \neq c$ (c) $a = b = c$ (d) $a \neq b = c$

87. If a quadratic curve $y = f(x)$, touches the line $y = x$ at the point $x = 1$ and passes through the point $(-1, 0)$, then equation of the quadratic curve is

- (a) $y = \frac{x^2}{2} + \frac{x}{4} - \frac{1}{4}$ (b) $y = x^2 + 2x + 1$ (c) $y = \frac{x^2}{4} + \frac{x}{2} + \frac{1}{4}$ (d) $y = \frac{x^2}{8} - \frac{x}{16} - \frac{1}{16}$

88. The surface area of two spheres are in the ratio $1 : 4$. The ratio of their volumes is:

- (a) $1 : 2$ (b) $1 : 8$ (c) $1 : 4$ (d) $1 : 6$

89. If $f(x) = 2^x$, then $f(0), f(1), f(2) \dots$ are in:

- (a) A. P. (b) Arithmetico Geometric Progression (c) G. P. (d) H. P.

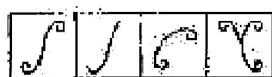
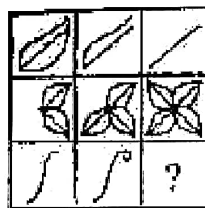
90. If the roots of the equation $x^2 - px + q = 0$ differ by unity then:

- (a) $p^2 = 4q - 1$ (b) $p^2 = 4q + 1$ (c) None of these (d) $p^2 = 4q$

91. Let $A = \{1, 2, 3\}$ and $R = \{(1, 2), (2, 3), (1, 3)\}$ be a relation on A then R is:

- (a) Neither symmetric nor transitive (b) None of these
(c) Transitive (d) Neither reflexive nor transitive

92. Select a suitable figure from the four alternatives that would complete the figure matrix:



A B C D

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

93. The value of $2^{2-\log_2 5}$ is:

- (a) $\frac{3}{5}$ (b) $\frac{4}{5}$ (c) $\frac{2}{5}$ (d) $\frac{1}{5}$

94. The number of straight lines can be formed out of 10 points of which 7 are collinear:

- (a) 21 (b) None of these (c) 25 (d) 26

95. If the roots of the equation $(b-c)x^2 + (c-a)x + (a-b) = 0$, are equal then 'b' is equal to:

- (a) $\frac{(a-c)}{2}$ (b) $2(a-c)$ (c) $\left(\frac{a+c}{2}\right)$ (d) $(a+c)$

96. In how many years, a sum will be thrice of it at the rate of 10% per annum?

- (a) 15 years (b) 40 years (c) 30 years (d) 20 years

97. The centre of a circle passing through the point $(0, 0), (1, 0)$ and touching the circle $x^2 + y^2 = 9$ is:

- (a) $\left(\frac{1}{2}, \frac{1}{2}\right)$ (b) $\left(\frac{1}{2}, -\sqrt{2}\right)$ (c) $\left(\frac{1}{2}, \frac{3}{2}\right)$ (d) $\left(\frac{3}{2}, \frac{1}{2}\right)$

98. The value of the $\int_0^4 |x^2 - 4| dx$, is

- (a) $\frac{16}{3}$ (b) 16 (c) $\frac{32}{3}$ (d) 8

99. Compute $\log_3 4 \log_4 5 \log_5 6 \log_6 7 \log_7 8 \log_8 9$:

- (a) 1 (b) 3 (c) 2 (d) 4

100. A table is bought For Rs 950 and sold at Rs. 1140. Find the gain percent:

- (a) 30% (b) 20% (c) 10% (d) 25%

101. Sanjana's brother-in-law is the son of Ramya. How is Sanjana's husband related to Ramya's husband if Sanjana had no siblings?

- (a) Father-in-law (b) Son (c) Son-in-law (d) Nephew

102. The value of $\begin{vmatrix} b+c & a-b & a \\ c+a & b-c & b \\ a+b & c-a & c \end{vmatrix}$ is:

- (a) $3abc - a^3 - b^3 - c^3$ (b) 0 (c) $a^2 + b^2 + c^2 - ab - bc - ca$ (d) $a^3 + b^3 + c^3 - abc$

103. The area of the greatest rectangle that can be inscribed in the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ is:

- (a) 4ab (b) 3ab (c) ab (d) 2ab

104. If α is an n th root of unity, then $1 + 2\alpha + 3\alpha^2 + \dots + n\alpha^{n-1}$ equals:

- (a) $\frac{-n}{1-\alpha}$ (b) $\frac{-n}{(1-\alpha)^2}$ (c) None of these (d) $\frac{n}{1-\alpha}$

105. In 1 minute $\frac{3}{7}$ of a bucket is filled. The rest of the bucket can be filled in:

- (a) $\frac{1}{3}$ minute (b) 2 minute (c) $\frac{4}{3}$ minute (d) $\frac{7}{3}$ minute

106. If $\frac{2x}{x-3} + \frac{1}{2x+3} + \frac{3x+9}{(2x+3)(x-3)} = 0$ $\left(x \neq 3, x \neq \frac{-3}{2}\right)$, then value of x is:

- (a) -2 (b) -1 (c) 2 (d) 1

107. REASON : SFBTPO :: THINK : ?

- (a) UJKPM (b) SGHMJ (c) UHNKI (d) UIJOL

108. The price of an article is reduced by 25%. In order to retain the original price, the present price has to be increased by

- (a) $33\frac{1}{3}\%$ (b) 20% (c) 50% (d) 25%

109. A man running a race-course, note that the sum of the distances from two flag posts from him is always 10 units and distance between the flag posts is 8 units. The equation of path traced by the man is:

- (a) $\frac{x^2}{25} + \frac{y^2}{9} = 1$ (b) $\frac{x^2}{25} - \frac{y^2}{16} = 1$ (c) $\frac{x^2}{9} - \frac{y^2}{16} = 1$ (d) $\frac{x^2}{25} + \frac{y^2}{16} = 1$

110. The point on the curve $y = x^3 - 11x + 5$ at which the tangent has the equation $y = x - 11$, is given by

- (a) (3, -8) (b) (-2, -13) (c) (2, -9) (d) (4, -7)

111. The value of $x^{\log y - \log z} \times y^{\log z - \log x} \times z^{\log x - \log y}$; is

- (a) $(x + y + z)^{\log x + \log y + \log z}$ (b) xyz (c) 0 (d) 0

112. Look at this series : 1.5, 2.3, 3.1, 3.9, what number should come next?

- (a) 4.2 (b) 4.4 (c) 5.1 (d) 4.7

113. David gets on the elevator at the 11th floor of a building and rides up at the rate of 57 floors per minute. At the same time, Albert gets on the elevator at the 51th floor of the same building and rides down at the rate of 63 floors per minute. If they continue travelling at these rates, then at which floor will their paths cross?

- (a) 28 (b) 30 (c) 37 (d) 19

114. Arrange the words given below in a meaningful sequence:

- (i) Presentation (ii) Recommendation (iii) Arrival (iv) Discussion (v) Introduction
 (a) v, iii, iv, i, ii (b) iii, v, iv, ii, i (c) iii, v, i, iv, ii (d) v, iii, i, ii, iv

115. If $x^2 + 4y^2 = 4xy$, then $x : y = ?$

- (a) 1 : 4 (b) 2 : 1 (c) 1 : 2 (d) 1 : 1

116. The difference between compound interest and simple interest on Rs. 8,000 at 5% p.a. for 3 years is:

- (a) Rs. 62 (b) Rs. 60 (c) Rs. 61 (d) Rs. 50

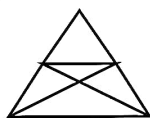
117. A train is moving with a speed of 180 km/hr. It is same as:

- (a) 5 m/sec. (b) 50 m/sec. (c) 30 m/sec. (d) 40 m/sec.

118. The line $\frac{x}{a} + \frac{y}{b} = 1$ touches the curve $y = be^{-x/a}$ at the point

- (a) $\left(a, \frac{a}{b}\right)$ (b) $\left(a, \frac{b}{a}\right)$ (c) $\left(-a, \frac{b}{a}\right)$ (d) None of these

119. Find the number of triangles in the given figure:



- (a) 14 (b) 12 (c) 10 (d) 8

120. Find the value of k so that the equations $2x^2 + kx - 5 = 0$ and $x^2 - 3x - 4 = 0$ have one root in common:

- (a) $\frac{-25}{4}$ (b) $\frac{27}{4}$ (c) $\frac{25}{4}$ (d) $\frac{-27}{4}$

Answer Key

1	2	3	4	5	6	7	8	9	10
C	B	D	D	C	D	D	C	A	B
11	12	13	14	15	16	17	18	19	20
C	B	A	A	C	D	C	D	B	A
21	22	23	24	25	26	27	28	29	30
C	B	A	A	C	A	D	D	B	D
31	32	33	34	35	36	37	38	39	40
C	A	C	D	A	C	C	D	C	D
41	42	43	44	45	46	47	48	49	50
C	D	B	A	A	D	C	B	A	B
51	52	53	54	55	56	57	58	59	60
B	B	B	A	C	A	D	D	B	B
61	62	63	64	65	66	67	68	69	70
B	A	B	C	B	A	D	D	D	B
71	72	73	74	75	76	77	78	79	80
B	C	A	A	C	C	D	D	B	C
81	82	83	84	85	86	87	88	89	90
C	C	A	C	D	C	C	B	C	B
91	92	93	94	95	96	97	98	99	100
C	B	B	C	C	D	B	B	C	B
101	102	103	104	105	106	107	108	109	110
B	A	D	A	C	B	D	A	A	C
111	112	113	114	115	116	117	118	119	120
D	D	B	C	B	C	B	D	B	D