

KIITEE MCA

Solved Paper 2012

Mathematics

1. The function $f(x) = \frac{x}{e^x - 1} - \frac{x}{2}$ is
- (a) an odd function (b) an even function
(c) a periodic function (d) None of these
2. Consider the following relations
 $R = \{(x, y) | x, y \text{ are real numbers and } x \sim y \text{ for some rational numbers } w\}$; $S = \left\{ \frac{m}{n}, \frac{p}{q} | m, n, p \text{ and } q \text{ are integers such that } n, q \neq 0 \text{ and } qm = pn \right\}$.
Then,
- (a) R is an equivalence relation but S is not an equivalence relation
(b) Neither R nor S is an equivalence relation
(c) S is an equivalence relation but R is not an equivalence relation
(d) R and S both are equivalence relation
3. If $f: [0, \infty) \rightarrow [0, \infty)$ and $f(x) = \frac{x}{1+x}$, then f is
- (a) one-one and onto
(b) one-one but not onto
(c) onto but not one-one
(d) Neither one-one nor onto
4. $\lim_{h \rightarrow 0} \frac{f(2h^2 - h^2) - f(2)}{f(h^2 - h^2 - 1) - f(1)}$, given that $f(2) = 6$ and $f(1) = 4$
- (a) does not exist (b) is equal to $-3/2$
(c) is equal to $3/2$ (d) is equal to 3
5. Range of the function $f(x) = \frac{x^2 - x + 2}{x^2 + x + 1}$; $x \in R$ is
- (a) $(1, \infty)$ (b) $1, \frac{11}{7}$
(c) $1, \frac{7}{3}$ (d) $1, \frac{7}{5}$
6. The conjugate of a complex number is $\frac{1}{i-1}$, then that complex number is
- (a) $\frac{1}{i-1}$ (b) $\frac{1}{i+1}$
(c) $\frac{1}{i+1}$ (d) $\frac{1}{i-1}$
7. If $|z^2 - 1| = |z|^2 - 1$, then z lies on
- (a) the imaginary axis (b) an ellipse
(c) a circle (d) the real axis
8. If z is a complex number such that $|z| = 1, z \neq 1$, then real part of $\frac{z-1}{z+1}$ is
- (a) $\frac{1}{|z-1|^2}$ (b) $\frac{1}{|z+1|^2}$
(c) $\frac{\sqrt{2}}{|z-1|^2}$ (d) 0
9. Locus of point z , so that z, i and iz are collinear, is
- (a) a straight line (b) a circle
(c) an ellipse (d) a rectangular hyperbola
10. The number of roots of the equation $|z|^2 - 5|z| + 1 = 0$ is
- (a) 0 (b) 2
(c) 4 (d) infinite
11. Consider the system of linear of equations
- $$\begin{matrix} x_1 + 2x_2 + x_3 = 3, \\ 2x_1 + 3x_2 + x_3 = 3 \end{matrix}$$
- and $3x_1 + 5x_2 + 2x_3 = 1$, the system has
- (a) infinite number of solutions
(b) exactly 3 solutions
(c) a unique solution

- (d) no solution
12. The number of 3×3 non-singular matrices, with four entries as 1 and all other entries as 0, is
 (a) atleast 7 (b) 5
 (c) 6 (d) less than 4
13. Let $A = \begin{pmatrix} 5 & 5 \\ 0 & 5 \\ 0 & 0 & 5 \end{pmatrix}$. If $\det A^2 = 25$, then $|A|$ is
 (a) 1 (b) $1/5$
 (c) 5 (d) 5^2
14. Let A be a 2×2 matrix with non-zero entries and let $A^2 = I$, where I is 2×2 identity matrix. Define $\text{Tr}(A)$ Sum of diagonal elements of A and $|A|$ Determinant of A .
 Statement I : $\text{tr}(A) = 0$; Statement II : $|A| = 1$.
 (a) Statement I is true, Statement II is true, Statement II is the correct explanation for Statement I
 (b) Statement I is true, Statement II is true, Statement II is not a correct explanation for Statement I
 (c) Statement I is true, Statement II is false
 (d) Statement I is false, Statement II is true
15. If $P = \begin{pmatrix} \sqrt{3} & 1 \\ 2 & 2 \end{pmatrix}$, $A = \begin{pmatrix} 1 & 1 \\ 0 & 1 \end{pmatrix}$ and $Q = PAP^T$, then $P^T Q^{2005} P$ is equal to
 (a) $\begin{pmatrix} 1 & 2005 \\ 0 & 1 \end{pmatrix}$ (b) $\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$
 (c) $\begin{pmatrix} 2005 & 2\sqrt{3} \\ 2 & \sqrt{3} & 2005 \end{pmatrix}$ (d) $\begin{pmatrix} 1 & 2005 \\ 2005 & 2005 \end{pmatrix}$
16. The largest integer k such that 3^k divides $2^{3^n} - 1$, $n \in \mathbb{N}$, is
 (a) 2 (b) n
 (c) $n - 1$ (d) $n + 1$
17. The remainder left out when $8^{2n} - 62^{(2n-1)}$ is divided by 9 is
 (a) 0 (b) 2
 (c) 7 (d) 8
18. The letters of the word 'COCHIN' are permuted and all the permutations are arranged in an alphabetical order as in an English dictionary. The number of words that appear before the word 'COCHIN' is
 (a) 360 (b) 192 (c) 96 (d) 48
19. For positive integer n , $10^n - 2 = 81n$, if
 (a) $n = 5$ (b) $n = 5$
 (c) $n = 5$ (d) $n = 6$
20. For all integers $n \geq 1$, which of the following is divisible by 9?
 (a) $8^n - 1$ (b) $3^{2n} - 3n - 1$
 (c) $4^n - 3n - 1$ (d) None of these
21. The locus of the mid-point of the line segment joining the focus to a moving point on the parabola $y^2 = 4ax$ is another parabola with directrix
 (a) $x = a$ (b) $x = \frac{a}{2}$
 (c) $x = 0$ (d) $x = \frac{a}{2}$
22. The area bounded by the curves $y = |x| - 1$ and $y = |x| + 1$ is
 (a) 1 (b) 2
 (c) $2\sqrt{2}$ (d) 4
23. If the equation of the locus of a point equidistant from the points (a_1, b_1) and (a_2, b_2) is $(a_1 - a_2)x + (b_1 - b_2)y - c = 0$, then c is equal to
 (a) $\frac{(a_2^2 - b_2^2 - a_1^2 + b_1^2)}{2}$ (b) $(a_1^2 - a_2^2 + b_1^2 - b_2^2)$
 (c) $\frac{(a_1^2 - a_2^2 + b_1^2 - b_2^2)}{2}$ (d) $\sqrt{a_1^2 - b_1^2 - a_2^2 - b_2^2}$
24. Let AB be a chord of the circle $x^2 + y^2 = r^2$ subtending a right angle at the centre. Then, the locus of the centroid of the $\triangle PAB$ as P moves on the circle is
 (a) a parabola (b) a circle
 (c) an ellipse (d) a pair of straight lines
25. The number of integer values of m for which the x -coordinate of the point of intersection of the lines $3x - 4y = 9$ and $y = mx + 1$ is also an integer, is
 (a) 2 (b) 0
 (c) 4 (d) 10
26. If the lines $\frac{x}{2} + \frac{y}{3} + \frac{z}{4} = 1$ and $\frac{x}{1} + \frac{y}{2} + \frac{z}{1} = 1$ intersect, then the value of k is
 (a) $\frac{3}{2}$ (b) $\frac{9}{2}$
 (c) $\frac{2}{9}$ (d) $\frac{3}{2}$

27. If $2x + y + 2z = 2$, $x + 2y + z = 4$, $x + y + z = 4$, then the value of $\cos^{-1} \frac{2}{7}$ such that the system of equations has no solution, is
 (a) 3 (b) 1
 (c) 0 (d) -3
28. Domain of definition of the function $f(x) = \sqrt{\sin^{-1} 2x - \frac{1}{6}}$ for real valued x is
 (a) $\frac{1}{4}, \frac{1}{2}$ (b) $\frac{1}{2}, \frac{1}{2}$
 (c) $\frac{1}{2}, \frac{1}{9}$ (d) $\frac{1}{4}, \frac{1}{4}$
29. If $\lim_{x \rightarrow 0} \frac{[(a - n)nx + \tan x] \sin x}{x^2} = 0$, where n is a non-zero real number, then a is equal to
 (a) 0 (b) $\frac{n-1}{n}$
 (c) n (d) $n - \frac{1}{n}$
30. The number of values of x in $[0, 3\pi]$ such that $2\sin^2 x - 5\sin x + 3 = 0$ is
 (a) 1 (b) 2
 (c) 4 (d) 6
31. If $\mathbf{a} = i + j + k$, $\mathbf{a} \cdot \mathbf{b} = 1$ and $\mathbf{a} \times \mathbf{b} = j + k$, then \mathbf{b} is
 (a) $i + j + k$ (b) $2j + k$
 (c) i (d) $2i$
32. The value of 'a' so that the volume of the parallelepiped formed by $i + aj + k$, $j + ak$ and $ai + k$ becomes minimum, is
 (a) -3 (b) 3
 (c) $\frac{1}{\sqrt{3}}$ (d) $\sqrt{3}$
33. Let $\mathbf{v} = 2i + j + k$ and $\mathbf{w} = i + 3k$. If \mathbf{u} is unit vector, then the maximum value of the scalar triple product $[\mathbf{u}\mathbf{v}\mathbf{w}]$ is
 (a) -1 (b) $\sqrt{10} + \sqrt{6}$
 (c) $\sqrt{59}$ (d) $\sqrt{60}$
34. If \mathbf{a} and \mathbf{b} are two unit vectors such that $\mathbf{a} \cdot 2\mathbf{b}$ and $5\mathbf{a} \cdot 4\mathbf{b}$ are perpendicular to each other, then the angle between \mathbf{a} and \mathbf{b} is
 (a) 45°
 (b) 60°
 (c) $\cos^{-1} \frac{1}{3}$
 (d) $\cos^{-1} \frac{2}{7}$
35. If the vectors $\mathbf{a} = i + j + 2k$, $\mathbf{b} = 2i + 4j + k$, $\mathbf{c} = i + j + k$ are mutually orthogonal, then $(\mathbf{a} \cdot \mathbf{b}, \mathbf{a} \cdot \mathbf{c})$ is equal to
 (a) (-3, 2) (b) (2, -3)
 (c) (-2, 3) (d) (3, -2)
36. The value of $\int \frac{\cos^2 x}{1 + a^x} dx$, where $a > 0$, is
 (a) $\frac{x}{2}$ (b) a
 (c) $\frac{x}{2}$ (d) 2
37. $\frac{d^2 x}{dy^2}$ is equal to
 (a) $\frac{d^2 y}{dx^2}^{-1}$ (b) $\frac{d^2 y}{dx^2}^{-1} \frac{dy}{dx}^{-3}$
 (c) $\frac{d^2 y}{dx^2} \frac{dy}{dx}^{-2}$ (d) $\frac{d^2 y}{dx^2} \frac{dy}{dx}^{-3}$
38. Which of the following functions is differentiable at $x = 0$
 (a) $\cos(|x|) + |x|$ (b) $\cos(|x|) - |x|$
 (c) $\sin(|x|) + |x|$ (d) $\sin(|x|) - |x|$
39. If $D^* f(x) = \lim_{h \rightarrow 0} \frac{f^2(x+h) - f^2(x)}{h}$, where $f^2(x) = \{f(x)\}^2$, then $D^*(\tan x)$ is equal to
 (a) $\sec^2 x$ (b) $2 \sec^2 x$
 (c) $\tan x \sec^2 x$ (d) $2 \tan x \sec^2 x$
40. Let $f(x) = e^x (x-1)(x-2)$. Then, f decreases in the interval
 (a) $(-\infty, 2)$ (b) $(2, 1)$
 (c) $(1, 2)$ (d) $(2, \infty)$
41. $\int \frac{\log x + 1}{1 + (\log x)^2} dx$ is equal to
 (a) $\frac{xe^x}{1+x^2} + C$ (b) $\frac{x}{(\log x)^2 + 1} + C$
 (c) $\frac{\log x}{(\log x)^2 + 1} + C$ (d) $\frac{x}{x^2 + 1} + C$
42. Let $f(x) = f'(x) = f''(x) = \frac{1}{x}$, where $f(x) = \int_1^x \frac{\log t}{1-t} dt$. Then, $f(e)$ equals to
 (a) $\frac{1}{2}$ (b) 0 (c) 1 (d) 2

43. If y is a function of x and $\log(x - y) = 2xy$, then the value of $y(0)$ is equal to
 (a) 1 (b) -1 (c) 2 (d) 0
44. If $f(x)$ is differentiable and $\int_0^{t^2} xf(x) dx = \frac{2}{5}t^5$, then $f\left(\frac{4}{25}\right)$ equals to
 (a) $\frac{2}{5}$ (b) $\frac{5}{2}$ (c) 1 (d) $\frac{5}{2}$
45. The value of $\lim_{x \rightarrow 0} \frac{\int_0^{x^2} \sin \sqrt{t} dt}{x^3}$ is
 (a) 0 (b) $\frac{2}{9}$
 (c) $\frac{1}{3}$ (d) $\frac{2}{3}$
46. The differential equation $\frac{dy}{dx} = \frac{\sqrt{1 - y^2}}{y}$ determines family of circles with
 (a) variable radii and a fixed centre at $(0, 1)$
 (b) variable radii and a fixed centre at $(0, -1)$
 (c) fixed radius 1 and variable centres along the x-axis
 (d) fixed radius 1 and variable centres along the y-axis
47. Two numbers are selected randomly from the set $S = \{1, 2, 3, 4, 5, 6\}$ without replacement one by one. The probability that minimum of the two numbers is less than 4, is
 (a) $\frac{1}{15}$ (b) $\frac{14}{15}$
 (c) $\frac{1}{5}$ (d) $\frac{4}{5}$
48. 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) $\frac{1}{12}$ (b) $\frac{1}{6}$
 (c) $\frac{1}{15}$ (d) $\frac{1}{9}$
49. How many different nine-digit numbers can be formed from the number 223355888 by rearranging its digits, so that the odd digits occupy even positions?
 (a) 16 (b) 36 (c) 60 (d) 180
50. Suppose $n - 3$ persons are sitting in a row. Two of them are selected at random. The probability that they are not together, is
 (a) $1 - \frac{2}{n}$ (b) $\frac{2}{n - 1}$
 (c) $1 - \frac{1}{n}$ (d) $\frac{2}{n}$
51. The function $f: R \rightarrow R$ given by $f(x) = 3 - 2 \sin x$ is
 (a) one-one (b) onto
 (c) bijective (d) None of these
52. Which of the following functions is an odd function?
 (a) $f(x) = \cos x$ (b) $y = 2 - x^2$
 (c) $y = 2^x - x^4$ (d) None of these
53. For real x , let $f(x) = x^3 - 5x + 1$, then
 (a) f is one-one but not onto R
 (b) f is onto R but not one-one
 (c) f is one-one and onto R
 (d) f is neither one-one nor onto R
54. The number i^i is
 (a) real and positive (b) real and negative
 (c) pure imaginary (d) None of these
55. Let $\arg(\bar{z}) = \arg(z) + \theta$, if $\arg(z) = 0$
 , if $\arg(z) = 0$
 The value of $\sqrt{\{\arg(z) + \arg(\bar{z}) - 2\} \{\arg(z) + \arg(\bar{z})\}}$
 $z = x + iy, x, y \neq 0$ is
 (a) $\frac{1}{2}$ (b) $\frac{1}{4}$
 (c) 0 (d) Not defined
56. Let $z = \cos \theta + i \sin \theta$. Then, the value of $\sum_{m=1}^{15} \operatorname{Im}(z^{2m-1})$ at $\theta = \frac{\pi}{2}$ is
 (a) $\frac{1}{\sin 2}$
 (b) $\frac{1}{2 \sin 2}$
 (c) $\frac{1}{6 \sin 2}$
 (d) $\frac{1}{4 \sin 2}$
57. If the line $x - 1 = 0$ is the directrix of the parabola $y^2 - kx - 8 = 0$, then one of the value of k is
 (a) $\frac{1}{8}$ (b) 8
 (c) 4 (d) $\frac{1}{4}$
58. The number of complex numbers satisfying the equation $|z| = 2$ and $|z| = |z - 1|$ is
 (a) 2 (b) 1

- (c) 0 (d) infinite
59. Let $f: R \rightarrow R$ be such that $f(1) = 3$ and $f^{-1}(1) = 6$.
Then, $\lim_{x \rightarrow 0} \frac{f(1-x)^{1/x}}{f(1)}$ equals to
- (a) 1 (b) $\frac{1}{e^2}$
(c) e^2 (d) e^3
60. If $z = 4 + i\sqrt{7}$, then the value of $z^3 - 4z^2 - 9z - 91$ equals to
(a) 0 (b) 1 (c) 2 (d) -1

Computer Awareness

61. The ALU of computer normally contains a number of high speed storage elements called
(a) semiconductor memory
(b) registers
(c) hard disk (d) magnetic disk
62. Offline device is
(a) a device which is not connected to CPU
(b) a device which is connected to CPU
(c) a direct access storage device
(d) an I/O device
63. A proxy server is used for which of the following?
(a) To provide security against unauthorised users
(b) To process client requests for web pages
(c) To process client requests for database access
(d) To provide TCP/IP
64. When data changes in multiple list and all lists are not updated, this causes
(a) data redundancy (b) information overload
(c) duplicate data (d) data inconsistency
65. Which of the following would most likely not be a symptom of a virus?
(a) Existing program files and icons disappear
(b) The CD-ROM stops functioning
(c) The web browser opens to an unusual home page
(d) Odd messages or images are displayed on the screen
66. Any data or instruction entered into the memory of a computer is considered as
(a) storage (b) output
(c) input (d) information
67. The computer code for interchange of information between terminals is
(a) ASCII (b) BCD (c) BCDIC (d) Hollerith
68. The two broad categories of software are
(a) word processing and spreadsheet
(b) transaction and application
(c) windows and mac OS
(d) system and application
69. A peripheral device used in a word processing system is
(a) floppy disk (b) magnetic card reader
(c) CRT (d) All of these
70. The analytical engine developed during first generation of computers used as a memory unit
(a) RAM (b) floppies
(c) counter wheels (d) punch cards
71. The daily processing of corrections to customer accounts best exemplifies the processing mode of
(a) time sharing (b) real time processing
(c) batch processing (d) offline processing
72. Which of the following terms could be used to describe the concurrent processing of computer programs via CRTs, on one computer system?
(a) Time sharing (b) Online processing
(c) Interactive processing (d) All of these
73. The most widely used commercial programming computer language is
(a) BASIC (b) COBOL
(c) FORTRAN (d) PASCAL
74. Which term identifies a specific computer on the web and the main page of the entire site?
(a) URL (b) Website address
(c) Hyperlink (d) Domain name
75. In excel, any set of characters containing a letter hyphen or space is considered
(a) a formula (b) a text
(c) a name (d) a title
76. Computers can be classified in which of the hierarchical orders?
(a) PC, Large, Super Micro, Super Computer
(b) Super Micro, PC, Large, Super Computer

- (c) PC, Super Micro, Large, Super Computer
(d) Large, Super Micro, Super Computer, PC
- 77.** In the binary language, each letter of the alphabet, each number and each special character is made up of a unique combination of
(a) eight bytes (b) eight kilobytes
(c) eight characters (d) eight bits
- 78.** Which part of operating system manages the essential peripherals, such as the keyboard, screen, disk drives and parallel and serial port?
(a) Basic input / Output system
(b) Secondary input / Output system
(c) Peripheral input / Output system
(d) Marginal input / Output system
- 79.** Word processing spreadsheet and photo editing are examples of
(a) application software
(b) system software
(c) operating system software
(d) platform software
- 80.** The ability to recover and read deleted or damaged files from a criminal's computer is an example of law enforcement speciality called
(a) robotics (b) simulation
(c) computer forensics (d) animation
- 81.** The most frequently used instructions of a computer programme are likely to be fetched from
(a) the hard disk (b) cache memory
(c) RAM (d) registers
- 82.** Two or more computers connected to each other for sharing information form a
(a) server (b) modem
(c) switch (d) network
- 83.** Unwanted repetitious messages, such as unsolicited bulk e-mail is known as
(a) spam (b) trash
- (c) calibri (d) courier
- 84.** A set of rules that computer on a network use to communicate with each other are called
(a) regulation (b) data flow
(c) protocol (d) network connectivity
- 85.** Which of the following contains data descriptions and defines the name, data type and length of each field in the database?
(a) Data dictionary (b) Data table
(c) Data record (d) Data field
- 86.** To delete an incorrect character in a document, which of the following is performed to erase to the right of the insertion point?
(a) Press the left mouse key
(b) Double click the right mouse key
(c) Press the Backspace key
(d) Press the delete key
- 87.** The blinking symbol on the computer screen is called the
(a) mouse (b) screen saver
(c) cursor (d) keyboard
- 88.** Software, such as viruses, worms and trojan horses, that has a malicious intent, is known as
(a) spyware (b) adware
(c) spam (d) malware
- 89.** After a picture has been taken with a digital camera and processed appropriately, the actual print of the picture is considered
(a) data (b) output
(c) input (d) the process
- 90.** The PC (Personal Computer) and the Apple Macintosh are examples of two different
(a) platforms
(b) applications
(c) programs
(d) storage devices

Analytical Ability & Logical Reasoning

- 91.** Free notebooks were distributed equally among children of a class. The number of notebooks each child got was one-eighth of the number of children. Had the number of the children been half, each child would have got 16 notebooks. How many notebooks were distributed in total?
(a) 512 (b) 500 (c) 450 (d) 412
- 92.** A man works for 2 days and then rests for one day, then works for 2 days and rests for one day and so on. For everyday he works and earns ` 100. How much will he earn from Monday to Saturday?
(a) ` 200 (b) ` 300 (c) ` 400 (d) ` 500
- 93.** in climbing a round pole of 80 m height, a monkey climbs 5 m in a minute and slips 2 m in

the alternate minute. To get to the top of the pole, the monkey would take

- (a) 51 min (b) 54 min (c) 58 min (d) 61 min

94. Ramesh and Kunal start walking to meet one another from places 25 km apart. If Ramesh walks at the rate of 2 km/h and Kunal at 3 km/h, how many hours will it be before they meet?

- (a) 4 h 20 min (b) 5 h
(c) 10 h (d) 12 h 30 min

95. Leena took a loan of ₹ 1200 with simple interest for as many years as the rate of interest. If she paid ₹ 432 as interest at the end of the loan period, what was the rate of interest?

- (a) 3.6 (b) 6
(c) 18 (d) Cannot be determined

96. A sum of money amounts to ₹ 9800 after 5 yr and ₹ 12005 after 8 yr at the same rate of simple interest. The rate of interest per annum is

- (a) 5% (b) 8%
(c) 12% (d) 15%

97. A boy multiplies 987 by a certain number and obtains 559981 as his answer. If in the answer, both 9's are wrong but the other digits are correct, then correct answer will be

- (a) 556581 (b) 555681
(c) 555181 (d) 553681

98. The unit's digit in the product $(7^{71} \cdot 6^{59} \cdot 3^{65})$ is

- (a) 6 (b) 4
(c) 2 (d) 1

99. To fill a tank, 25 buckets of water is required. How many buckets of water will be required to fill the same tank, if the capacity of the bucket reduced to two-fifth of its present?

- (a) $62\frac{1}{2}$ (b) $60\frac{1}{2}$
(c) 60 (d) 62

100. Three numbers which are coprime to each other are such that the product of the first two is 551 and that of the last two is 1073. Find the sum of three numbers.

- (a) 89 (b) 85
(c) 81 (d) 75

101. Three years ago, the average age of a family of five members was 17 yr. A baby having been born, the average age of the family is the same as what was three years ago. The present age of the baby is

- (a) 6 months (b) 9 months
(c) 1 yr (d) 2 yr

102. The distance between two stations A and B is 300 km. A train leaves the station A with a speed of 40 km/h. At the same time another train departs from the station B with a speed of 50 km/h. How much time will these two trains take to cross each other?

- (a) 3 h 40 min (b) 3 h 20 min
(c) 2 h 20 min (d) 3 h 45 min

103. Early morning after sunrise, Rajesh was standing in front of his house in such a way that his shadow was falling exactly behind him. He starts walking straight and walks 5 m. He turns to his left and walks 3 m and again turning to his left walks 2 m. Now, in which direction is he from his starting point?

- (a) South-West
(b) North-West
(c) South-East
(d) North-East

104. A box contains 2 white balls, 3 black balls and 4 red balls. In how many ways can 3 balls be drawn from the box, if atleast one black ball is to be included in the draw?

- (a) 32 (b) 48
(c) 64 (d) 96

105. A machine P can print one lakh books in 8 h; machine Q can print the same number of books in 10 h while machine R can print them in 12 h. All the machines are started at 9:00 am while machine P is closed at 1:00 am and the remaining two machines complete work. Approximately, at what time will the work (to print one lakh books) be finished?

- (a) 11:30 am (b) 12 noon
(c) 12:30 pm (d) 1:00 pm

106. In three annual examinations, of which the aggregate marks of each was 500, a student secured average marks 45% and 55% in the first and the second yearly examinations, respectively. To secure 60% average total marks, it is necessary for him in third yearly examination to secure marks

- (a) 300 (b) 350
(c) 400 (d) 450

107. On sports day, if 30 children were made to stand in a column, then 16 columns could be formed. If 24 children were made to stand in a column, then how many columns could be formed?

- (a) 45 (b) 29

- (c) 22 (d) 20
- 108.** A shop gives 10% discount on the purchase of an item. If paid for in cash immediately, a further discount of 12% is given. If the original price of the item is ₹ 250, what is the price of the article, if a cash purchase is made?
 (a) ₹ 200 (b) ₹ 195
 (c) ₹ 198 (d) ₹ 190
- 109.** The number of revolutions of a wheel of diameter 40 cm makes in travelling a distance of 176 m, is
 (a) 140 (b) 150
 (c) 160 (d) 200
- 110.** A horse is tied at the corner of a rectangular field, whose length is 20 m and width is 16 m with a rope whose length is 14 m. Find the area which the horse can graze?
 (a) 156 sq m (b) 154 sq m
 (c) 164 sq m (d) 144 sq m
- 111.** In a two-digit number, unit's digit exceeds its ten's digit by 2 and that the product of the given number and the sum of its digits is equal to 144. What is the number?
 (a) 46 (b) 42
 (c) 26 (d) 24
- 112.** Divide 48 into two parts such that 7 times the first part, added to 5 times the second part is 246. Then, the smallest part is
 (a) 2 (b) 3
 (c) 4 (d) 5
- 113.** If 'M \$ N' means 'M is the father of N', 'M N' means 'M is the sister of N' and 'M * N' means 'M is the brother of N', then what is the relation of C with A in A B \$ C * D?
 (a) Niece (b) Nephew
 (c) Aunt (d) Data inadequate
- 114.** The students of a class are divided into two groups A and B. If Sangita is included in the group A, then her rank is 7th from the top and if she is included in the group B, her rank is 13th from the top. If the students of both groups are brought together, what will be the rank of Sangita?
 (a) 20 (b) 19
- (c) 21 (d) None of these
- 115.** It is given that M is either greater than or equal to P. P is smaller than Q and Q is not greater than R. Which of the following is definitely true?
 (a) M is either greater than or equal to R
 (b) M is either greater than or equal to Q
 (c) R is greater than P
 (d) R is either greater than or equal to P
- 116.** Four friends in the sixth grade were sharing a pizza. They decided that the oldest friend would get the extra piece. Ram is two months older than Gagan, who is three months younger than Neeraj. Rehan is one month older than Gagan. Who should get the extra piece of pizza?
 (a) Ram (b) Gagan
 (c) Neeraj (d) Rehan
- 117.** In how many different ways can the letters of the word 'OPTICAL' be arranged, so that the vowels always come together?
 (a) 120 (b) 720
 (c) 4320 (d) 2160
- 118.** In a certain code language, 'AUTHORITY' is written as 'YTUROHTIA'. How will 'DESIGNATE' be written in that code language?
 (a) ESENGATDI (b) ESEGNITAD
 (c) ESENGITAD (d) ESNEIGTDA
- 119.** At the baseball game, Henry was sitting in seat 253. Maria was sitting to the right of Henry in seat 254. In the seat to the left of Henry was John. Alex was sitting to the left of John. Which seat is Alex sitting in?
 (a) 251 (b) 254
 (c) 255 (d) 256
- 120.** The maximum number of students among whom 1001 pens and 910 pencils can be distributed in such a way that each student gets the same number of pens and the same number of pencil, is
 (a) 1911
 (b) 1001
 (c) 910
 (d) 91