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PAPER-12

Aptitude Test for 2nd Year MCA
(Lateral Entry)

अनुक्रमिक / Roll No.

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प्रश्नपुस्तिका क्रमांक / कोड
Question Booklet St. No. / Code

BC

Q. Booklet Code

उत्तर-शीट क्रमांक / OMR Answer Sheet No.

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घोषणा : / Declaration :

मैंने पृष्ठ संख्या 1 पर दिये गये निर्देशों को पढ़कर समझ लिया है।

I have read and understood the instructions given on page No. 1.

1201302

परिीक्षा केन्द्राध्यक्ष की वेब

Seat of Superintendent of Examination Centre

--

परिीक्षार्थी के हस्ताक्षर / Signature of Candidate
(आवेदन पत्र के अनुषार / as signed in application)

कक्षा निरीक्षक के हस्ताक्षर / Signature of the Invigilator

परिीक्षार्थी का नाम /
Name of Candidate :

पुस्तिका में सुसुलभ तहित पृष्ठों की संख्या
No. of Pages in Booklet including title 16

समय 2 घंटे
Time 2 Hours

अंक / Marks
400

पुस्तिका में प्रश्नों की संख्या
No. of Questions in Booklet 100

परिीक्षार्थियों के लिए निर्देश / INSTRUCTIONS TO CANDIDATES

परिीक्षार्थी को दिये गये पैराग्राफ की नकल खबे की हस्तालिपि में नीचे दिये गये रिक्त स्थान पर नकल (कॉपी) करनी है।

'आप सही व्यवसाय में हैं, यह आप सभी जानते हैं।'
अथवा / OR

To be copied by the candidate in your own handwriting in the space given below for this purpose is compulsory.
"You will know you are in the right profession when : you wake anxious to go to work, you want to do your best daily, and you know your work is important."

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अभ्यर्थियों हेतु आवश्यक निर्देश :

Instructions for the Candidate :	
1	Use BLUE or BLACK BALL POINT PEN only for all entries and for filling the bubbles in the OMR Answer Sheet.
2	Before opening the SECURITY SEAL of the question booklet, write your Name, Roll Number (in figures), OMR Answer-sheet Number in the space provided at the top of the Question Booklet. Non-compliance of these instructions would mean that the Answer Sheet can not be evaluated leading the disqualification of the candidate.
3	Each question carries FOUR marks. No marks will be awarded for unattempted questions. There is no negative marking on wrong answer.
4	Each multiple choice question has only one correct answer and marks shall be awarded for correct answer.
5	Use of calculator, log tables, mobile phones, any electronic gadget and slide rule etc. is strictly prohibited.
6	Candidate will be allowed to leave the examination hall at the end of examination time period only.
7	If a candidate is found in possession of books or any other printed or written material from which he/she might derive assistance, he/she is liable to be treated as disqualified. Similarly, if a candidate is found giving or obtaining (or attempting to give or obtain) assistance from any source, he/she is liable to be disqualified.
8	English version of question paper is to be considered as authentic and final to resolve any ambiguity.

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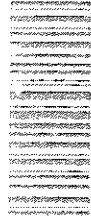


DO NOT FOLD HERE

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OMR Answer Sheet No.

1201802



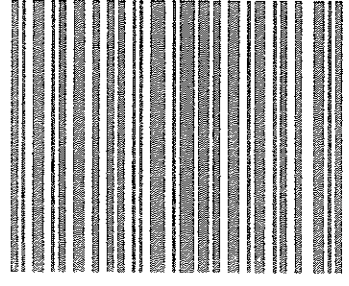
If candidate lampart... with the BARCODE... will be disqualified

Question Booklet Serial No.

Roll No.

Use Blue or Black Ball Pen Only

Table with 10 rows of bubbles for roll number entry



Subject

- Paper 1, Paper 2, Paper 3, Paper 4, Paper 5, Paper 6, Paper 7, Paper 8, Paper 9, Paper 10, Paper 11, Paper 12

Centre Seal

Barcode label with up arrow and BARCODE

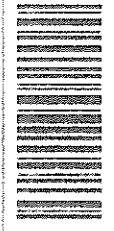
I certify that I have filled all entries as per instructions given in the Question Booklet, OMR Answer Sheet

Signature of Candidate

FACSIMILE

I certify that the entries above of Question Booklet Serial No., Roll No. & Subject are checked, found to be correct.

Signature of Invigilator



Do not write your Name or Roll No. on this half of the sheet. Mark your Answers by blackening the appropriate bubbles, with Blue or Black Ball Point Pen only. Do not use Pencil.

Large grid of bubbles for marking answers, numbered 1 to 50

IMPORTANT INSTRUCTIONS

1. For all entries in OMR answer sheet use Blue/Black ball point pen only.
2. Entries in rectangular boxes must be written & the corresponding circles must be filled in completely.

Example:

Roll No. 30210-10		Question Booklet Code
Roll No.		Question Booklet Code
Use Blue or Black Ball Pen Only		
1	0	A
2	1	B
3	2	C
4	3	D
5	4	E
6	5	F
7	6	G
8	7	H
9	8	I
10	9	J

3. Ensure that you have filled up Roll Number, Question Booklet Code & Subject in the corresponding space provided for.

4. DO NOT scribble, scratch, cut, tear, fold, wrinkle or rough work on OMR Answer Sheet.

5. The Questions are of multiple - choice type. Out of the four Choice given, only one is the correct answer. Darken the circle corresponding to the most appropriate answer completely using Blue/Black ball point pen only.

Example :

Q. No. 1 : The capital of India is

- | | |
|---------------------------------|--|
| <input type="radio"/> New Delhi | Correct Method: <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> |
| <input type="radio"/> Kolkata | Wrong Method: <input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> |
| <input type="radio"/> Chennai | |
| <input type="radio"/> Mumbai | |

6. Answer sheet will be processed electronically. Invalidation of answers due to incorrect method of filling will be sole responsibility of the candidate.
7. Each Question carries four marks. The marks would be awarded only for correct answer. No marks would be awarded for wrong & unattempted answers. Incorrect method of filling may lead to invalidation of answer, for which candidate will be solely responsible.
8. Bar Code printed on the Answer Sheet must not be tampered with or in any way marked otherwise the candidature will be rejected.
9. Use of calculator, log table, slide rule and communication devices such as mobile phone, pager etc. is completely prohibited.
10. The above Instructions must be strictly followed. Any violation or deviation may cause cancellation of candidature. Further for cancellation of candidature before or after the admission due to incorrect/incomplete/untrue/fraudulent entries candidate will be solely responsible.

- 1 If Node is a type, then expression new Node returns a value of type :
- (A) Node
(B) Node*
(C) Node**
(D) Node&
- 2 'Push' and 'Pop' are appropriate operations for which data structures is :
- (A) A linked list
(B) A queue
(C) A stack
(D) A two-dimensional array
- 3 Which of the following statements is/are true in connection with a graph?
- (A) Purely array-based representation of the graph is called its path matrix.
(B) Depth first traversal and Breadth first traversal techniques can be used only for graphs.
(C) A multi-graph is a graph where two vertices can be joined by multiple edges.
(D) None of the above
- 4 File extensions are used in order to :
- (A) Name the file
(B) Ensure the file name is not lost
(C) Identify the file
(D) Identify the file type

[12]

2

- 5 Which one of the following is an OS software?
- (A) Windows 2000.
(B) Word 2000.
(C) Access 2000.
(D) Publisher 2000.
- 6 The UNIX shell is simply
- (A) A command-line interpreter
(B) A priveleged program
(C) A GUI interface
(D) A set of commands
- 7 The decimal equivalent of a binary number 101.101 is :
- (A) 5.6249
(B) 5.625
(C) 5.5
(D) 5.25
- 8 If A, B, C be three sets such that $A \cup B = A \cup C$ and $A \cap B = A \cap C$, then :
- (A) $A=B$
(B) $B=C$
(C) $A=C$
(D) $A=B=C$
- 9 Let $A=\{a, b, c\}, B=\{b, c, d\}, C=\{a, b, d, e\}$, then $A \cap (B \cup C)$ is :
- (A) $\{a, b, c\}$
(B) $\{b, c, d\}$
(C) $\{a, b, d, e\}$
(D) $\{e\}$

P.T.O. 

- 10 A set contains $2n - 1$ elements. The number of subsets of this set containing more than n elements is equal to :
- (A) 2^{n-1}
 (B) 2^n
 (C) 2^{n+1}
 (D) 2^{2n}
- 11 A class has 175 students. The following data shows the number of students opting for one or more subjects. Mathematics 100, Physics 70, Chemistry 40; Mathematics and Physics 30, Mathematics and Chemistry 28, Physics and Chemistry 23; Mathematics, Physics and Chemistry 18. How many students have offered Mathematics alone ?
- (A) 35
 (B) 48
 (C) 60
 (D) 22
- 12 Given, $n(U) = 20$, $n(A) = 12$, $n(B) = 9$, $n(A \cap B) = 4$, where U is the universal set, A and B are subsets of U , then $n((A \cup B)^c)$ is equal to :
- (A) 17
 (B) 9
 (C) 11
 (D) 3
- 13 Let A and B be two sets such that $n(A) = 0.16$, $n(B) = 0.14$, $n(A \cup B) = 0.25$ then, $n(A \cap B)$ is equal to :
- (A) 0.3
 (B) 0.5
 (C) 0.05
 (D) None of these
- 14 If A , B and C are any three sets, then $A - (B \cap C)$ is equal to :
- (A) $(A - B) \cup (A - C)$
 (B) $(A - B) \cap (A - C)$
 (C) $(A - B) \cup C$
 (D) $(A - B) \cap C$
- 15 If $A = \{1, 2, 4\}$, $B = \{2, 4, 5\}$, $C = \{2, 5\}$, then $(A - B) \times (B - C)$ is :
- (A) $\{(1, 2), (1, 5), (2, 5)\}$
 (B) $\{(1, 4)\}$
 (C) $\{(1, 4)\}$
 (D) None of these
- 16 If $A = \begin{bmatrix} 2 & -1 \\ -1 & 2 \end{bmatrix}$ and $A^2 - 4A - nI = 0$, then ' n ' is equal to :
- (A) 3
 (B) -3
 (C) $1/3$
 (D) $-1/3$

17 If $\begin{bmatrix} 1 & 2 \\ 2 & 1 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 5 \\ 4 \end{bmatrix}$, then

- (A) $x = 2, y = 1$
 (B) $x = 1, y = 2$
 (C) $x = 3, y = 2$
 (D) $x = 2, y = 3$

18 Which of the following is incorrect ?

- (A) $A^2 - B^2 = (A+B)(A-B)$
 (B) $(A^T)^T = A$
 (C) $(AB)^n = A^n B^n$, Where A, B commute
 (D) $(A-I)(I+A) = O \Leftrightarrow A^2 = I$

19 If $|A|$ denotes the value of the determinant of the square matrix A of order 3, then

$|-2A|$ is equal to :

- (A) $-8 |A|$
 (B) $8 |A|$
 (C) $-2 |A|$
 (D) None of the above

20 Matrix theory was introduced by :

- (A) Newton
 (B) Cayley-Hamilton
 (C) Cauchy
 (D) Euclid

21 If $A=O$ and $B=O$ are $n \times n$ matrix such that $AB=O$, then

- (A) $\det(A) = 0$ or $\det(B) = 0$
 (B) $\det(A) = 0$ and $\det(B) = 0$
 (C) $\det(A) = \det(B) = 0$
 (D) $A^{-1} = B^{-1}$

22 If $a^{-1} + b^{-1} + c^{-1} = 0$ such that

$$\begin{vmatrix} 1+a & 1 & 1 \\ 1 & 1+b & 1 \\ 1 & 1 & 1+c \end{vmatrix} = \lambda,$$
 then the value

of λ is :

- (A) 0
 (B) abc
 (C) $-abc$
 (D) None of these

23 Select the correct arrangement

- (A) Bit, Nibble, Byte, MB, KB, GB
 (B) Bit, Byte, GB, MB, Nibble, KB
 (C) Bit, Nibble, Byte, KB, MB, GE
 (D) Bit, Byte, Nibble, KB, GB, ME

24 What is the value of ${}^X Y$, for

$$(59.125)_{10} = (X)_4 ?$$

- (A) 213.02
 (B) 223.02
 (C) 210.02
 (D) None of these

Directions for Q. 25 - Q. 27 : Read the information carefully and answer the questions based on it.

Five persons are sitting in a row. One of the two persons at the extreme ends is intelligent and other one is fair. A fat person is sitting to the right of a weak person. A tall person is to the left of the fair person and the weak person is sitting between the intelligent and the fat person.

25 Tall person is at which place counting from right?

- (A) First
- (B) Second
- (C) Third
- (D) Fourth

26 Person to the left of weak person is

- (A) Intelligent
- (B) Fat
- (C) Fair
- (D) Tall

27 Which of the following persons is sitting at the center ?

- (A) Intelligent
- (B) Fat
- (C) Fair
- (D) Weak

28

Lakshman went 15 km to the West from his house, then turned left and walked 20 km. He then turned East and walked 25 km and finally turning left covered 20 km. How far is he now from his house?

- (A) 15 km
- (B) 20 km
- (C) 25 km
- (D) 10 km

29

Introducing Asha to guests, Bhaskar said, "Her father is the only son of my father".

How is Asha related to Bhaskar?

- (A) Daughter
- (B) Mother
- (C) Sister
- (D) Niece

30

If HINDU is coded as 61257 and MAN is coded as 924, INDIRA will be coded as:

- (A) 454626
- (B) 594921
- (C) 452787
- (D) 884572

31

Complete the series 2, 6, 12, 20, _____
42, 56, 72, 90.

- (A) 20
- (B) 21
- (C) 30
- (D) 12

32 If, SAILOR : : SHIP, then
LAWYER : : _____

- (A) Legal
- (B) Law
- (C) Court
- (D) Ruling

33 Find the word that cannot be formed
from the letters used in the word
METAMORPHOSIS ?

- (A) TOMATO
- (B) ROTATION
- (C) OASIS
- (D) ASTROMETER

34 Which of the following word comes at
the third position in a dictionary ?

- (A) Arrangement
- (B) Arrest
- (C) Arrears
- (D) Arrival

35 A shepherd had 17 sheep. All but nine
died. How many was he left with ?

- (A) Nil
- (B) 8
- (C) 9
- (D) 17

36 Given the sequence of terms, AD, CG,
FK, JP, the next term is :

- (A) OV
- (B) OW
- (C) PV
- (D) PW

37 Consider the following logical inferences.

I_1 : If it rains then the cricket
match will not be played.
The cricket match was played.

Inference : There was no rain.

I_2 : If it rains then the cricket
match will not be played. It
did not rain.

Inference : The cricket match was played.

Which of the following is TRUE ?

- (A) Both I_1 and I_2 are correct inferences
- (B) I_1 is correct but I_2 is not a correct
inference
- (C) I_1 is not correct but I_2 is a correct
inference
- (D) Both I_1 and I_2 are not correct
inferences

- 38 Choose the most appropriate option to complete the following sentence:
Despite several _____ the mission succeeded in its attempt to resolve the conflict.
- (A) attempts
(B) setbacks
(C) meetings
(D) delegations
- 39 The pair of equations $x + 2y + 5 = 0$ and $-3x - 6y + 1 = 0$ have :
- (A) a unique solution
(B) exactly two solutions
(C) infinitely many solutions
(D) no solution
- 40 Convert 261D to hexadecimal :
- (A) 105H
(B) 105G
(C) 106H
(D) 106G
- 41 The protocol data unit (PDU) for the application layer in the Internet stack is:
- (A) Segment
(B) Datagram
(C) Message
(D) Frame
- 42 The amount of ROM needed to implement a 4 bit multiplier is :
- (A) 64 bits
(B) 128 bits
(C) 1 Kbits
(D) 2 Kbits
- 43 Solve the equation;
$$-(-x-5)+5(x-9)=2(x+8)-(2x+5)$$
- (A) 5
(B) no solutions
(C) 17/2
(D) 15/2
- 44 Let $S = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9\}$.
What is the smallest integer 'K' such that any subset of 'S' of size 'K' contains two disjoint subsets of size two, $\{x_1, x_2\}$ and $\{y_1, y_2\}$, such that $x_1+x_2=y_1+y_2=9$?
- (A) 8
(B) 9
(C) 7
(D) 6
- 45 How many integers from 100 to 999 are divisible by 7 ?
- (A) 128
(B) 120
(C) 182
(D) 118

- 46 If $x=a$, $y=b$ is the solution of the equations $x-y=2$ and $x+y=4$, then the values of a and b are, respectively
- (A) 3 and 5
 - (B) 5 and 3
 - (C) 3 and 1
 - (D) -1 and -3

- 47 The father's age is six times his son's age. Four years hence, the age of the father will be four times his son's age. The present ages, in years, of the son and the father are, respectively

- (A) 4 and 24
- (B) 5 and 30
- (C) 6 and 36
- (D) 3 and 24

- 48 The number of zero in $29!$ is

- (A) 4
- (B) 3
- (C) 6
- (D) 7

- 49 If a pair of linear equations is consistent, then the lines will be

- (A) parallel
- (B) always coincident
- (C) intersecting or coincident
- (D) always intersecting

- 50 An automobile plant contracted to buy shock absorbers from two suppliers X and Y. X supplies 60% and Y supplies 40% of the shock absorbers. All shock absorbers are subjected to a quality test. The ones that pass the quality test are considered reliable. Of X's shock absorbers, 96% are reliable. Of Y's shock absorbers, 72% are reliable. The probability that a randomly chosen shock absorber, which is found to be reliable, is made by Y is :

- (A) 0.288
- (B) 0.334
- (C) 0.667
- (D) 0.720

- 51 If the lines given by $3x+2ky=2$ and $2x+5y+1=0$ are parallel, then the value of k is

- (A) $-5/4$
- (B) $2/5$
- (C) $15/4$
- (D) $3/2$

- 52 A file system with 300 GByte disk uses a file descriptor with 8 direct block addresses, 1 indirect block address and 1 doubly indirect block address. The size of each disk block is 128 Bytes and the size of each disk block address is 8 Bytes. The maximum possible file size in this file system is :

- (A) 3 KBytes
- (B) 35 KBytes
- (C) 280 KBytes
- (D) dependent on the size of the disk.

53 How many bytes does "D" use ?

- (A) 0
- (B) 1
- (C) 2
- (D) 3

54 lint is :

- (A) a C compiler
- (B) an interactive debugger
- (C) a C interpreter
- (D) a tool for analyzing a C program

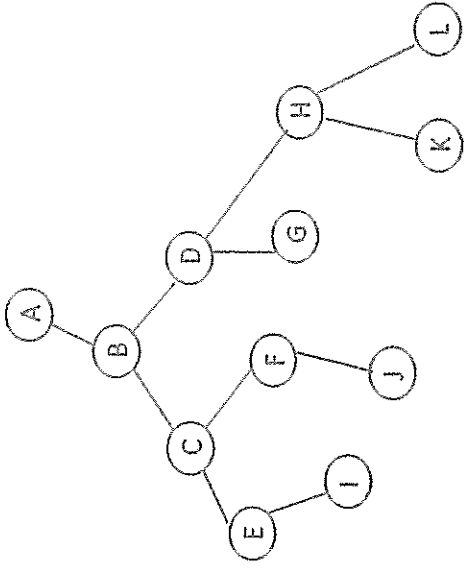
55 Preprocessing is typically done -

- (A) either before or at the beginning of the compilation process
- (B) after compilation but before execution
- (C) after loading
- (D) None of the above

56 The contents of a file will be lost if it is opened in :

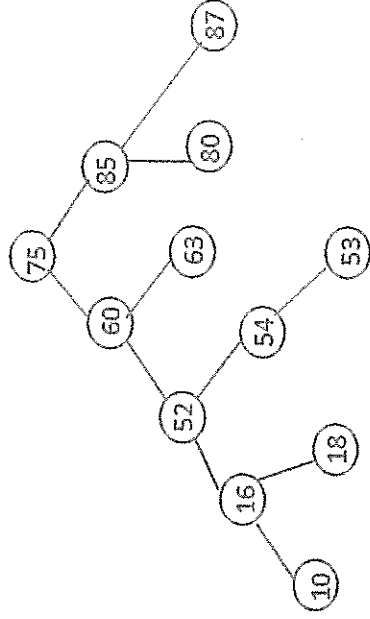
- (A) a mode
- (B) w mode
- (C) w + mode
- (D) a + mode

57 Which of the following expressions show the pre-order, in-order, post order respectively in the following Binary tree:



- (A) ABCEIFJDHGKL,
EICFJBGDKKHLA,
IEJFCGKLIHDBA
- (B) ABCEIFJDGHKL,
IEJFCGKLIHDBA,
EICFJBGDKKHLA
- (C) ABCEIFJDGHKL,
EICFJBGDKKHLA,
IEJFCGKLIHDBA
- (D) EICFJBGDKKHLA,
ABCEIFJDGHKL,
IEJFCGKLIHDBA

Questions Q. 58 - Q. 60 are based on the following binary search tree :



59 If one wants to insert a new node $p=84$, after inserting new node $p=55$, to the above tree, what is the correct insertion point without violating the binary search property?

- (A) Left child of node number 65
- (B) Left child of node number 63
- (C) Left child of node number 80
- (D) Right child of node number 80

58 If one wants to insert a new node $p=55$, what is the correct insertion point without violating the binary search property?

- (A) Right child of node number 18
- (B) Right child of node number 53
- (C) Left child of node number 63
- (D) Right child of node number 54

60 If one wants to delete node number 60 from the tree after inserting new node $p=55$, and thereafter another at $p=84$, what is the suitable replacing node without violating the binary search properties?

- (A) Node numbers 63 and 53
- (B) Node numbers 52 and 54
- (C) Node numbers 18 and 80
- (D) Node numbers 63 and 54

- 61 If $f(n)$ = sum of all the digits of n , where ' n ' is a natural number, then what is the value of $f(101) + f(102) + f(103) + \dots + f(200)$?
(A) 1001
(B) 1000
(C) 1210
(D) 1010

- 62 The unit digit in the product of $(2157)^{173}$ is
(A) 3
(B) 7
(C) 9
(D) 1

- 63 The sum of first 45 natural number is
(A) 2070
(B) 1035
(C) 1280
(D) 2140

- 64 The number of factors of a number $N=2^3 \times 3^2 \times 5^3$ is
(A) 18
(B) 45
(C) 48
(D) 9

- 65 A number when divided by 296 leaves 75 as remainder. If the same number is divided by 37, the remainder obtained is
(A) 2
(B) 1
(C) 11
(D) 8

- 66 The sum of $\bar{2}.75$ and $\bar{3}.78$ is
(A) $\bar{5}.53$
(B) $\bar{4}.53$
(C) $\bar{1}.53$
(D) $\bar{1}.03$

- 67 If $(1^2 + 2^2 + 3^2 + \dots + 10^2) = 385$, then the value of $(2^2 + 4^2 + 6^2 + \dots + 20^2)$ is equal to :
(A) 770
(B) 1540
(C) 1155
(D) $(385)^2$

- 68 The number of zeros in the product $5 \times 10 \times 25 \times 40 \times 50 \times 55 \times 65 \times 125 \times 80$ is :
(A) 12
(B) 8
(C) 13
(D) 9

- 69 If $-1 \leq x \leq 2$ and $1 \leq y \leq 3$, the least possible value of $(2y-3x)$ is :
- (A) 0
(B) -3
(C) -4
(D) -5

- 70 How many prime factors are there in the expression $(12)^{43} \times (34)^{48} \times (2)^{57}$?
- (A) 282
(B) 237
(C) 142
(D) 61

- 71 Which among the following is greatest?

$$-\sqrt{7} + \sqrt{3}, \sqrt{5} + \sqrt{5}, \sqrt{6} + 2$$

- (A) $-\sqrt{7} + \sqrt{3}$
(B) $\sqrt{5} + \sqrt{5}$
(C) $-\sqrt{6} + 2$
(D) All are equal

- 72 The positive integer which is nearest to 1000 and divisible by 2, 3, 4, 5 and 6 is:
- (A) 1020
(B) 1040
(C) 960
(D) 1030

- 73 Bag A contains 4 green and 3 red balls and bag B contains 4 red and 3 green balls. One bag is taken at random and a ball is drawn and found it as green. The probability that it comes from bag B is :
- (A) $2/7$
(B) $2/3$
(C) $3/7$
(D) $1/3$

- 74 If a dice is thrown 7 times, then the probability of obtaining 5 exactly 4 times is :

- (A) ${}^7C_4 (1/6)^4 (5/6)^3$
(B) ${}^7C_4 (1/6)^3 (5/6)^4$
(C) $(1/6)^4 (5/6)^3$
(D) $(1/6)^3 (5/6)^4$

- 75 If $P(A) = \frac{1}{2}$, $P(B) = \frac{1}{3}$ and $P(A \cap B) = \frac{7}{12}$, then the value of $P(A' \cap B')$ is :

- (A) $7/12$
(B) $3/4$
(C) $1/4$
(D) $1/6$

- 76 For an event, odds against is 6:5. The probability that event does not occur, is:

- (A) $5/6$
(B) $6/11$
(C) $5/11$
(D) $1/6$

- 77 If A and B are two independent events such that $P(A)=0.40$, $P(B)=0.50$. Find P (neither A nor B)
- (A) 0.90
(B) 0.10
(C) 0.2
(D) 0.3

78 Three ships A , B and C sail from England to India. If the ratios of their arriving safely are 2:5, 3:7 and 6:11 respectively, then the probability of all the ships for arriving safely is :

- (A) $18/595$
(B) $6/17$
(C) $3/10$
(D) $2/7$

79 Among 15 players, 8 are batsman and 7 are bowlers. Find the probability that a team is chosen of 6 batsman and 5 bowlers.

- (A) $({}^8C_6 \times {}^7C_5) / {}^{15}C_{11}$
(B) $({}^8C_6 \times {}^7C_3) / {}^{15}C_{11}$
(C) $15/28$
(D) None of these

80 Two cards are drawn one by one at random from a pack of 52 cards. The probability that both of them are king is:

- (A) $2/13$
(B) $1/169$
(C) $1/221$
(D) $30/221$

81 A single letter is selected at random from the word 'PROBABILITY'. The probability that the selected letter is a vowel is

- (A) $2/11$
(B) $3/11$
(C) $4/11$
(D) 0

82 The set $A = \{-2, -1, 0, 1, 2\}$ is not a group with respect to addition of numbers because the set does not possess the property of:

- (A) Closure
(B) Associative
(C) Existence of identity
(D) Existence of inverse

83 In the group $G = \{0, 1, 2, 3, 4, 5\}$ under addition modulo 6, the inverse of 4 is:

- (A) 1
(B) 2
(C) 3
(D) 5

84 A group of order ' n ' is isomorphic to :

- (A) a Cyclic group
(B) a Permutation group
(C) an Alternating group of order n
(D) None of the above

- 85 If $f(x) = x|x|$ and $g(x) = \sqrt{|x|}$ then the number of elements in the set $\{x \in R : f(x) = g(x)\}$ is
- (A) 1
 (B) 2
 (C) 3
 (D) Infinitely many

- 86 If $a, b \in G$, the equation $ax=b, ya=b$ have:
- (A) No solution
 (B) A unique solution
 (C) Infinitely many solutions
 (D) None of these

- 87 Function $\sin^{-1}\sqrt{x}$ is defined in the interval:
- (A) $(-1,1)$
 (B) $[0,1]$
 (C) $[-1,0]$
 (D) $(-1,2)$

- 88 Let $f(x) = \sin x + \cos x, g(x) = x^2 - 1$. Thus, $g(f(x))$ is invertible for $x \in$.

- (A) $\left[-\frac{\pi}{2}, 0\right]$
 (B) $\left[-\frac{\pi}{2}, \pi\right]$
 (C) $\left[-\frac{\pi}{2}, \frac{\pi}{4}\right]$
 (D) $\left[0, \frac{\pi}{2}\right]$

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- 89 $f(x, y) = \frac{1}{x+y}$ is a homogeneous

function of degree :

- (A) 1
 (B) -1
 (C) 2
 (D) -2

- 90 Find domain of $f(x) = \log_{10}(1+x^3)$

- (A) $(-1, \infty)$
 (B) $(1, \infty)$
 (C) $(-\infty, \infty)$
 (D) None of the above

- 91 How many words can be made from the letters of the word 'BHARATI' in which 'B' and 'H' never come together?

- (A) 360
 (B) 300
 (C) 240
 (D) 120

- 92 There are 'n' different books and 'p' copies of each in a library. The number of ways in which one or more than one book can be selected is :

- (A) p^{n+1}
 (B) $(p+1)^n - 1$
 (C) $(p+1)^n - p$
 (D) p^n

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- 93 Ramesh has 6 friends. In how many ways can he invite one or more of them at the dinner?
- (A) 61
(B) 62
(C) 63
(D) 64
- 94 If ${}^{20}C_r = {}^{20}C_{r-10}$, then ${}^{18}C_r$ is equal to :
- (A) 4896
(B) 816
(C) 1632
(D) None of the above
- 95 Minimum number of queues needed to implement the priority queue is :
- (A) 1
(B) 2
(C) 3
(D) 4
- 96 How many different trees are possible with 10 nodes?
- (A) 1014
(B) 1000
(C) 1041
(D) None of these
- 97 A dangling pointer is :
- (A) A pointer to memory that has been deleted
(B) A pointer to memory that is no longer in use
(C) A pointer to memory that also has other pointers to it
(D) A pointer that was created by using new
- 98 The 8086/8088 used two processing units which were known as
- (A) Left and Right units
(B) Segment and Offset units
(C) Bus Unit and Execution Interface Unit
(D) ALU and Control Unit
- 99 The Boolean expression $X + X'Y$ equals to
- (A) $X + Y$
(B) $X + XY$
(C) $Y + YX$
(D) $X'Y + Y'X$
- 100 Please select the registers from the following.
- (A) Accumulator
(B) Stack pointer
(C) Program Counter
(D) All of the above

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