

MCA 2011 – EXAMINATION PAPER

1. A sequence of odd numbers is formed as follows:
1, 3, 3, 3, 5, 5, 5, 5, 5, 7, 7, 7, 7, 7, 7, 7
What is the number in the 251st place?
1) 27 2) 28 3) 29 4) 30
 2. Out of 50 hockey and football players, the number of players who play only hockey is the same as that who play only football. The number of those playing only hockey is twice that of those playing both games. How many players play both games?
1) 5 2) 20 3) 10 4) 25
 3. A, B, C and D are four numbers. Two of them are 0; one is positive and one is negative. AB is not equal to CD, Which of the following can be negative?
1) C+D 2) AD+BC 3) AC 4) BCD
 4. A motorist knows four different routes from Bristol to Birmingham. From Birmingham to Sheffield he knows three different routes and from Sheffield to Carlisle he knows two different routes. How many routes does he know from Bristol to Carlisle?
1) 4 2) 8 3) 12 4) 24
 5. In a group of 15 people, 7 read French, 8 read English while 3 of them read none of these two. How many of them read French and English both?
1) 0 2) 3 3) 4 4) 5
 6. The ratio of milk and water in 150 litres of a solution of milk is 4:1. How much water must be added to this 150 litres of milk so that the ratio of milk to water becomes 4:3?
1) 100 litre 2) 60 litre
3) 50 litre 4) 55 litre
 7. A magician called the following to the stage - Beena, Dileep, Farookh and Harish. Whom will he call next?
1) Pradeep 2) Maneesh 3) Jameel 4) Meenal
 8. If SEEMA WANTS WATER is 1 2 3, WATER IS BLUE is 1 4 5, SEEMA HAS BLUE DRESSES is 2 4 6 7, SANGEETA HAS WATER is 7 1 8, then SANGEETA WANTS BLUE DRESSES will have the numbers:
1) 8346 2) 8256 3) 7246 4) 8546
 9. Mohini bought an article. She sold it for Rs.31.25 making a percentage profit equal to the cost price of the article. What is the cost price of the article?
1) 30 2) 25 3) 24 4) 20
- Directions for questions (10–14) :**
- There are four nurses – Anita, Beena, Chaiya and Dimple working at the private nursing home, which is open from Monday through Friday. Each nurse works according to the following rules:
- On Mondays, only Anita or Beena works.
- On Tuesdays, Beena works alone or with one of the other nurses, but not Anita.
- On Wednesdays, Chaiya works alone or with one of the other nurses.
- On Thursdays, two nurses work together, but Beena is not one of them.
- On Fridays, three nurses work together.
10. Beena must work on which of the following days?
1) Monday 2) Tuesday
3) Wednesday 4) Thursday
 11. If only Beena and Dimple are working on a certain day, which day must it be?
1) Monday 2) Tuesday
3) Wednesday 4) Thursday
 12. If only one nurse is working on a particular day, which one of the following must be true?
1) Monday or Tuesday
2) Monday or Tuesday or Wednesday
3) Tuesday or Wednesday or Thursday
4) Tuesday or Thursday or Friday

13. If we know that Dimple is working on a particular day but don't know whether anyone else is working, that day could be all of the following EXCEPT

- 1) Monday 2) Tuesday
- 3) Wednesday 4) Thursday

14. If two nurses are working on a particular day, and neither of them is Chaiya, which one of the following must be true?

- 1) Monday or Tuesday
- 2) Tuesday or Wednesday
- 3) Tuesday or Thursday
- 4) Wednesday or Thursday

Directions for questions (15–17) :

Read carefully the passage given below and answer the questions that follow.

The seizures of cocaine laboratories in Colombia, South America, underscore a little noted but crucial fact of life in the \$130 billion cocaine business. The drug trade is a two-way street. The cocaine flows from mostly third world producers to the United States or other industrialised nations, but the chemicals and other materials needed to turn coca leaves into cocaine flow comes from the industrialised nations to the third world. By participating in this Faustian technology transfer, the drug consumers are in effect providing raw ingredients for the scourge that bedevils them and that they often blame exclusively on coke-producing countries. "Look at all this equipment", said a Colombian police commander, surveying the ruins of a coke lab, "It is almost all from the United States, and the chemicals from all over the world. All Latin American supplies are the coca-leaves and the labour."

15. The passage seeks to

- 1) blame U.S.A. for supplying equipment for processing cocaine.
- 2) preclude the Latin American countries from blame.
- 3) show how deeply the drug problem has affected Pan American relations.
- 4) bring out the international nature of this curse that faces "mankind".

16. By "Faustian technology transfer" the author means

- 1) transfer of technology involving a deal with the devil.
- 2) transferring technology in order to taste greater power.
- 3) technology that is transferred, ends in a fatal experience.
- 4) exchanging technology for a raw material that asks for a very high price.

17. The two way street indicates

- 1) all men are greedy
- 2) to eradicate drugs, the world has to cooperate.
- 3) the growing distance between the haves and the have-nots.
- 4) men from all nations are attracted to the high returns in a substance known to be harmful.

Directions for questions (18 and 19) :

Pick out the most effective word from the given words to fill in the blank to make the sentence meaningfully complete.

18. The anticipated higher income growth following the second ——— bumper harvest claimed this year is hoped to ease the demand constraint.

- 1) continuous 2) consecutive
- 3) successive 4) gradual

19. We live in an interdependent world and cannot therefore afford to ——— our neighbour.

- 1) insult 2) offend
- 3) annoy 4) irritate

20. The sum of 10000.101 and 1100.001 is

- 1) 28.75 2) 24.54
- 3) 28.625 4) 24.375

21. A cricketer has an average of 24 runs in 24 innings. How many runs must he score in the 25th innings to make the average equal to 25 runs?

- 1) 25 2) 49 3) 50 4) 100

22. From two ornaments weighing 18 gm and 24 gm, containing gold and silver in the ratio of 2:1 and 5:1 respectively, a new ornament is casted. What is the amount of gold in the new ornament in gms?

- 1) 10 2) 12 3) 32 4) 28

23. The ratio of milk and water in a 48 litre mixture is 7:5. How much of milk is required to be added to this mixture, so that the ratio becomes 3:2?

- 1) 3 litres 2) 4 litres 3) 1 litre 4) 2 litres

24. 10 litres solution of water and salt contains 150 gm salt. If 25% of solution gets evaporated, what percent of salt would the remaining solution have?

- 1) 1.5% 2) 2.0% 3) 1.75% 4) 2.5%

25. Which one of the following numbers would fit into the series: 2, 9, 16, 23, 30, 37 ?

- 1) 1253 2) 1255 3) 1257 4) 125935

26. Amit wants to distribute either type A or type B or type C of the chocolates to his friends at the birthday party. If he has 225, 250 and 260 nos. of types A, B and C respectively and he wishes to give equal no. of either of these to his friends, how many minimum no. of packets would he have to prepare?

- 1) 97 2) 735 3) 51 4) 147

27. For painting of the house, it is estimated that 480 kg of paint is needed. Accounting for wastage @ 20% and that the paint is available in tins of 25 kg only, what is the cost of painting if each tin is costing Rs.250?

- 1) 5,000 2) 6,400 3) 5,600 4) 6,000

Directions : Refer to the data below and answer the questions from 28 to 30 :

Col. Singh wants to select instructors at the Indian Army's Commando Training School. The instructors should meet the following criteria:

- The candidate should be a serving army officer.
- The candidate should be a graduate of the National Defence Academy (NDA).

- The candidate should be below 40 years of age.
- The candidate should have passed through a commando course in the past 2 years.

The only possible exceptions to these rules are:

- If not a graduate of the NDA, should have passed out of the Indian Military Academy (IMA), and been in the top of his/her class of IMA – give a leadership exam.
- If not an officer, must have won at least 2 gallantry awards – meet Gen. C.
- If between 40 and 45 – meet Gen. J.
- If the commando course is taken before two years – go through a fitness test.

Col. Singh has received the following applications:

- The 25 years old Captain T, stood second in his class in IMA, and completed commando training 2 weeks ago.
- Jawan E, winner of 3 gallantry awards, passed out of NDA at the age of 22, 15 years ago. He completed a commando course 6 months ago.
- Major W(retired), a 39-year-old is a former NDA graduate and passed a commando course 3 months ago.
- Col. P, a 42 year old is an NDA and has passed a commando course 1 year back.
- Captain Y, a 24-year-old passed out of NDA and has never been to do a commando course.

28. What should be done with Jawan E?

- 1) Accept 2) Reject
3) Fitness test 4) Meet Gen. C

29. What should be done with Captain Y?

- 1) Meet Gen. C 2) Reject
3) Accept 4) Meet Gen. J

30. What should be done with Captain T?

- 1) Meet Gen. J 2) Meet Gen. C
3) Leadership Exam. 4) Reject

31. If "CODES" is coded as "DQGIX", then what is the code for "LOGIC"?

- 1) MPHJD 2) MQJMH
3) MQJMI 4) MQHKE

32. In a class of 80 students, 20% dislike teacher A and 30% dislike teacher B. 50% of the students do not dislike any teacher. How many students dislike both teachers A and B?

- 1) 40 2) 20
3) 30 4) None of these

Directions : Refer to the data below and answer the question (33 to 35) :

There are five books A, B, C, D and E from five different subjects, that are, Geology, Maths, Physics, Chemistry and Zoology.

- a) A is not a Geology or Maths book.
b) B is not a Maths, Physics or Chemistry book.
c) C is not a Geology, Physics or Zoology book.
d) D is a Chemistry book.
e) If C is a Maths book, then E must be a Zoology book.

33. Which is the Maths book?

- 1) A 2) B 3) C 4) A or C

34. Which is the Zoology book?

- 1) A 2) B 3) E 4) A or E

35. Which is the Physics book?

- 1) A 2) E 3) C 4) E or C

Directions : Refer to the data below and answer the Questions (36 and 37) :

R * 2 7 5 E ! \$ A S O 3 = 4 # N I N @ 8 ! N 6 \$ G

36. What is the difference between the sum of the numbers and the number of symbols in the given series?

- 1) 27 2) 28 3) 29 4) 26

37. How many letters are immediately followed by a symbol in the above series?

- 1) 2 2) 4 3) 5 4) 3

Directions : Refer to the data below and answer the Questions (38 to 41) :

Six lectures are to be organised in a day and six different persons, A, B, C, D, E and F will deliver

these lectures. The arrangement of lectures follow few conditions given below :

- a) A wakes up late so he cannot give the first or the second lecture.
b) B should give a lecture just after D's lecture.
c) Between E and F there will be two lectures and F's lecture should be held fourth.

38. The fifth lecture can be delivered by all of the following except :

- 1) A 2) D 3) C 4) B

39. Who can deliver lecture just after E's lecture?

- 1) Only A 2) Only D
3) D or C 4) Only C

40. If C's lecture is the second one, then whose lecture must follow F's lecture?

- 1) E 2) D 3) B 4) A

41. If A's lecture will be held fifth, then who will deliver the 6th lecture?

- 1) C 2) B 3) D 4) E

42. The most technologically advanced societies have been responsible for the greatest ----- indeed savagery seems to be indirect proposition to -----

- 1) inventions - know-how
2) wars - viciousness
3) triumphs - civilisations
4) atrocities - development

43. The ----- tones of the flute succeeded in ----- his tense nerves.

- 1) blatant - enhancing
2) hovendous - calming
3) vibrant - portraying
4) mellifluous - soothing

44. It would be difficult for one so ----- to be led to believe that all men are equal and that we must disregard race, colour and creed.

- 1) intolerant 2) democratic
3) emotional 4) patient

45. Unlike the Shakespearean plays, The “closet dramas” of the nineteenth century were meant to be ----- rather than -----

1. seen - acted 2) read - acted
3. produced - acted 4) quiet - loud

46. We never believed that he would resort to ----- in order to achieve his goal; we always regarded him as a -----

- 1) subterfuge - honest 2) charm - insincere
- 3) necromancy - pietistic 4) logic - honorable

47. Yellow fever, the disease that killed 4,000 Philadelphians in 1793, and so ----- Memphis, Tennessee, that the city lost its charter, has reappeared after nearly two decades in ----- in the western hemisphere.

- 1) disabled - quarantine 2) decimated - abeyance
- 3) terrorised - contention 4) ravaged - secret

Use the following passage to answer questions (48 to 50) :

A clear answer to whether the languages of the ancient American people were made use of for expressing abstract universal concepts can be sought in the case of Nahuatl, which like Greek and German, is a language that allows the formation of extensive compounds. By combining radicals or semantic elements, single compound words can express complex conceptual relations, often of an abstract universal character.

The tlamatime (“those who know”) were able to use this rich stock of abstract terms to express the nuances of their thought. They also availed themselves of other forms of expression with metaphorical meaning, some probably original, some derived from Toltec coinages. Of these forms the most characteristic in Nahuatl is the juxtaposition of two words that, because they are synonyms, associated terms, or even contraries, complement each other to evoke one single idea. The juxtaposed terms, used as metaphor, suggest specific or essential traits of the being they refer to, introducing a mode of poetry as an almost habitual form of expression.

48. The main purpose of the passage is to

- 1) argue against a theory of poetic expression by citing evidence about the Nahuatl.

- 2) delineate the function of the tlamatime in Nahuatl society
- 3) explore the rich metaphorical heritage the Nahuatl received from the toltecs
- 4) describe some conceptual and aesthetic resources of the Nahuatl language.

49. It can be inferred solely from the information in the passage that

- 1) Metaphors are always used in Nahuatl to express abstract conceptual relationships.
- 2) There are many languages that, like Greek or German, allow extensive compounding.
- 3) The abstract terms of the Nahuatl language are habitually used in poetry
- 4) Some record or evidence of the thought of the tlamatime exists

50. According to the passage, some abstract universal ideas can be expressed in Nahuatl by

- 1) putting various meaningful elements together in one word
- 2) taking away from a word any reference to particular instances
- 3) turning each word of a phrase into a poetic metaphor
- 4) giving a word a new and opposite meaning.

51. Water is continuously poured from a reservoir to a locality at a steady rate of 10,000 litres per hour. When delivery exceeds demand the excess water is stored in a tank. If the demand for 8 consecutive three-hour periods is 10000, 10000, 45000, 25000, 40000, 15000, 60000 and 35000 litres respectively, the minimum capacity required of the water tank (in 1000 litres) to meet the demand is

- 1) 10 2) 30 3) 40 4) 50

52. Jhaveri invested in Upendra & Upendra, Celco and Winger shares at Rs.300, Rs.200 and Rs.5 per share respectively. He bought 100 shares for Rs.1,000. The number of Upendra & Upendra and Celco shares he bought are respectively.

- 1) 23, 17 2) 17, 23
- 3) 17, 60 4) 15, 25

- 53. A certain organisation has three committees. Only two persons are members of all committees, but every pair of committees have three members in common. What is the least possible no. of members on any one committee?**
 1) 4 2) 5
 3) 6 4) None of the above
- 54. One bottle is half-full of oil and another bottle with twice the capacity is one quarter full of oil. If water is added so that both the bottles are full and the contents of both are then poured into a third bottle that is empty and large enough to hold the contents of both, what fractions of the contents in the third bottle is oil?**
 1) $\frac{1}{4}$ 2) $\frac{1}{3}$ 3) $\frac{3}{8}$ 4) $\frac{2}{3}$
- 55. Don and his wife each receive an 8 percent annual raise. If Don receives a raise Rs.800 and his wife receives a raise of Rs.840, what is the difference between their annual income after their raises?**
 1) 40 2) 460 3) 500 4) 540
- 56. If 5 tomatoes are worth 8 oranges, 5 oranges are worth 4 apples, 7 apples are worth 3 pineapples and 7 pineapples cost Rs.203, then the approx. price of each tomato is**
 1) 16 2) 5
 3) 19 4) None of the above
- 57. 1 Kbyte is**
 1) 1000 bytes 2) 1016 bytes
 3) 1008 bytes 4) 1024 bytes
- 58. The heart of the Computer is**
 1) Input devices 2) Output devices
 3) Central processing unit 4) Peripheral devices
- 59. DOS in MS-DOS stands for**
 1) Disk open system 2) Disk operating system
 3) Disk open standards 4) Device operating system
- 60. Pressing the following keys simultaneously will reboot your computer automatically**
 1) Ctrl – Alt – Del 2) Shift – Alt – Del
 3) Shift – Tab – Del 4) Ctrl – Tab – Del
- 61. Which helps you to build documents from very simple letters to comprehensive manuscripts?**
 1) MS-Excell 2) MS-Word
 3) MS-Access 4) MS-Powerpoint
- 62. The basic operations performed by a computer are**
 1) Arithmetic 2) Logical
 3) Storage and Retrieval 4) All of the above
- 63. The earliest calculating devices are**
 1) Abacus 2) Clock
 3) Different engine 4) None of the above
- 64. The man who built the first mechanical calculator was**
 1) Joseph Marie Jacquard 2) John Mauchly
 3) Blaise Pascal 4) Harward Aliken
- 65. Punched cards were first introduced by**
 1) Powers 2) Pascal
 3) Jacquard 4) Herman Hollerith
- 66. The event A is independent of itself if and only if**
 1) $P(A) = 1$ 2) $P(A) = \frac{1}{2}$
 3) $P(A) = \frac{1}{3}$ 4) None of the above
- 67. If the sum of two numbers is 200, then the largest value of their product is**
 1) 9000 2) 10000
 3) 100000 4) 1900
- 68. The equation of the curve which passes through the point (1, -1) and has slope $3x^2$ is**
 1) $y = 3x^3 - 2$ 2) $y = 3x^2$
 3) $y = 3x^3$ 4) None of the above
- 69. Which one of the following is true?**
 1) A semi-group with more than one idempotent element cannot be a group.
 2) If G is a group, then it may not be a monoid.
 3) G is a group if and only if it is a semi-group.
 4) None of the above

- 70. The points of maximum and minimum curvature on the curve $y = \log x$, x and y are real and $-\pi \leq x \leq \pi$ are**
 1) $\pm\pi$ 2) $0, \pm\pi/4$ respectively
 3) $\pm\pi/2, \pm\pi$ respectively 4) None of the above
- 71. The area of the circle whose center is at (0, 0) is 25π . The circle passes through all the points except.**
 1) $(-5, 0)$ 2) $(5, 0)$ 3) $(5, 5)$ 4) $(0, 5)$
- 72. A class room has r rows of desks with d desks in each row. On a particular day when all pupils are present 3 seats are left vacant (one student per desk). The number of pupils in the class is**
 1) $dr-3$ 2) $d+r+3$ 3) $dr+3$ 4) $r/d+3$
- 73. The length of a rectangle is increased by 50%. By what percent the width has to be decreased to maintain the same area?**
 1) 33.33 2) 50 3) 66.67 4) 150
- 74. If the radius of a circle is 0.5m, how many revolutions does the wheel make per kilometer?**
 1) 1000 2) 2000 3) $1000/\pi$ 4) $2000/\pi$
- 75. The average of 5, 10, 15, and X is 20. What is X ?**
 1) 20 2) 25 3) 45 4) 50
- 76. What is the largest prime factor of 255?**
 1) 15 2) 5 3) 51 4) 17
- 77. A and B are in the ratio 5:4. B and C are in the ratio 6:7 then A:B:C is**
 1) 30 : 24 : 28 2) 5 : 10 : 7
 3) 5 : 4 : 7 4) 15 : 12 : 14
- 78. "Idle brain is a devils workshop". Which of the following has the same logic?**
 1) Hardwork is the basis of success.
 2) Dissatisfied person is rebellious.
 3) Educated are cultured people.
 4) Players are physically healthy.
- 79. "The ground is wet because it has rained" which of the following is based on the same logic?**
 1) Leaves are green because they have chlorophyll
 2) Iron is unbreakable because it is logical
 3) The lawyer is convincing because he is logical
 4) The soldier is bleeding because he is injured.
- 80. Pick the odd one out.**
 1) Counting sort 2) Bucket sort
 3) Shell sort 4) Radix sort
- 81. The complexity of merge operation on two sorted arrays of size m and n (given $m > n$)**
 1) $O(mn)$ 2) $O(m+n)$
 3) $O(m/n)$ 4) $O(m)$
- 82. Pick the odd one out.**
 1) Random value 2) Return address
 3) Local variable space 4) Global variable space
- 83. The function for which among the following will not be linear recursion**
 1) Factorial
 2) Fibonacci series
 3) a^b
 4) Sum of the natural numbers
- 84. How many stack will be needed for the evaluation of a prefix expression?**
 1) 1 2) 2 3) 0 4) 3
- 85. Which one of the following may be true for a quadratic equation (α is real)?**
 1) If α is a root, $1/\alpha$ is also a root.
 2) If α is a root, $-\alpha$ is also a root.
 3) If α is a root, $i\alpha$ is also a root.
 4) If $i\alpha$ is a root, $-i\alpha$ is also root.
- 86. If α a and β are the roots of $|x^2+x+5| + 6x+1=0$ then $\alpha+\beta$ is**
 1) 7 2) -7 3) 5 4) -5
- 87. If $a+b+c=0$, then one root of the equation $ax^2-bx+c=0$ is**
 1) $-b/a$ 2) $-c/a$
 3) $(a+c)/a$ 4) $(a+b)/a$

- 88. If a and b are positive integers such that $a^3 - b^3$ is a prime number, then $a^3 - b^3$ is**
 1) $a^2 + ab + b^2$ 2) $a^2 - ab + b^2$
 3) $a + b$ 4) $a - b$
- 89. The smallest angle in degrees between the hour and minute needles of a clock when the time is 12 hr 30 min is**
 1) 180° 2) 165° 3) 196° 4) 150°
- 90. The collating sequence of five alphabets is W, P, Z, A and E. Which one will be the first string of the above collating sequence?**
 1) AZPWW 2) APAEP 3) ZPAPA 4) ZAPWE
- 91. How many numbers between 100 and 300 (inclusive) is divisible by 3?**
 1) 100 2) 66
 3) 76 4) None of the above
- 92. Which one of the following figures has the largest area for the given circumference?**
 1) Square 2) Triangle
 3) Circle 4) Ellipse
- 93. If $2 < r < 8$ and $1 < s < 5/2$ which one of the following expresses all possible values of rs?**
 1) $1 < rs < 5$ 2) $2 < rs < 20$
 3) $5/2 < rs < 8$ 4) $5/2 < rs < 20$

Directions for questions (94–98) : Read the passage and answer the questions given below the passage.

A family consisting of six members AA, BB, CC, DD, EE, and FF is travelling together.

We have

- BB is the son of CC but CC is not the mother of BB.
 - FF is the brother of BB.
 - EE is the brother of CC.
 - DD is the daughter of AA.
 - AA and CC are a married couple.
- 94. How many male members are there in the family?**
 1) 1 2) 2 3) 3 4) 4
- 95. Who is the mother of BB?**
 1) AA 2) BB 3) CC 4) DD
- 96. How many children does AA have?**
 1) 1 2) 2 3) 3 4) 4
- 97. How many brother-brother pair can be made from the above family?**
 1) 1 2) 2 3) 3 4) 4
- 98. How is EE related to DD?**
 1) Father 2) Brother
 3) Uncle 4) Sister-in-law
- 99. The function $f(x) = q + |\sin x|$ is**
 1) discontinuous everywhere
 2) not differentiable at $x=0$
 3) not differentiable at an infinite number of points
 4) All of the above
- 100. The function $f(x) = 2\log(x-2) - x^2 + 4x + 1$ increases in the interval**
 1) (1, 2) 2) (2, 3)
 3) (2, 4) 4) (1, 5)

MCA 2011 – ANSWERS

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

MCA 2011 – DETAILED SOLUTIONS

1. (*)

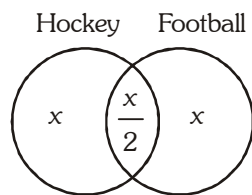
1, 3, 3, 3, 5, 5, 5, 5, 5, 7, 7, 7, 7, 7, 7, 7, 7
 $\downarrow \quad \quad \downarrow \quad \quad \quad \downarrow \quad \quad \quad \downarrow$
 1st term 4th term 9th term 16th term

$\therefore$ From n^2+1 to $(n+1)^2$ the terms are $2n+1$

$\therefore$ From 15^2+1 to 16^2 , the terms are $2 \times 15 + 1 = 31$

i.e. From 226 to 256, the terms are 31.

2. (3)



$$x + x + \frac{x}{2} = 50$$

$$\Rightarrow \frac{5x}{2} = 50$$

$$\therefore x = \frac{50 \times 2}{5} = 20$$

Number of players playing both games

$$= \frac{x}{2} = \frac{20}{2} = 10$$

3. (1)

Let $A = 0$; $B = 0$

$C = 5$; $D = -10$

Then $AB \neq CD$

Also $C+D = 5+(-10)$

$= -5$ negative

4. (4)

Number of routes $= 4 \times 3 \times 2$

$$= 24$$

5. (2)

$$n(F) = 7$$

$$n(E) = 8$$

$$n(F \cup E) = 15 - 3 = 12$$

$$n(F \cup E) = n(F) + n(E) - n(F \cap E)$$

$$12 = 7 + 8 - n(F \cap E)$$

$$\therefore n(F \cap E) = 15 - 12 = 3$$

6. (2)

$$\text{Milk} = \frac{4}{4+1} \times 150 = \frac{4}{5} \times 150 = 120$$

$$\text{Water} = 150 - 120 = 30$$

Let x liters of water added to make the ratio 4:3

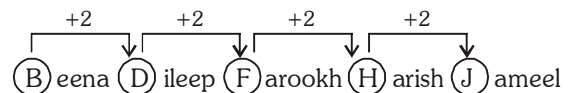
$$\text{then} \quad \frac{120}{30+x} = \frac{4}{3}$$

$$\Rightarrow 360 = 120 + 4x$$

$$4x = 360 - 120 = 240$$

$$\therefore x = \frac{240}{4} = 60 \text{ ltrs.}$$

7. (3)



$\therefore$ Next person = Jameel

8. (1)

Water = 1

Seema = 2

Sangeeta = 8

Wants = 3

Blue = 4

is = 5

has = 7

Dress = 6

SANGEETA WANTS BLUE DRESSES

$= 8 \ 3 \ 4 \ 6$

9. (2)

Let the C.P be Rs. x

Then profit % = $x\%$

$$\text{Selling price} = \frac{100+x}{100} \times x = 31.25$$

$$\Rightarrow 100x + x^2 = 3125$$

From the given options $x = 25$

satisfies above equation

$\therefore$ C.P. = Rs. 25

Directions (10–14) :

Total No. of Nurses = 4

On Monday only one (either Anita/Beena) works

On Tuesdays two nurses work (Beena and Other)

Work on Wednesdays Chaiya alone / with one of the other nurses

Beena is not work on Thursday

Friday 3 nurses work

	Monday only one	Tuesday 1 or 2	Wednesday 1 or 2	Thursday 2	Friday 3
Anita	✓ (alone)	✗	✓	✓	✓
Beena	(or) ✓ (alone)	✓ (alone)	✓	✗	✓
Chaiya	✗	✓	✓ (alone)	✓	✓
Dimple	✗	✓	✓	✓	✓

10. (2)

It is given that on Tuesdays, Beena works alone or with one of the other nurses but not Anita.

⇒ Beena must work on Tuesday.

11. (2)

Dimple is not working on Monday.

Beena is not working on Thursday

Only possibilities are Tuesdays and Wednesdays

But on Wednesdays Chaiya works alone or with one of the other nurses.

∴ If Beena and Dimple are working on a certain day that day must be Tuesday.

12. (2)

It is given that Anita/Beena, Beena, Chaiya works alone on Mondays, Tuesdays and Wednesdays respectively.

Hence only one nurse is working on Monday or Tuesday or Wednesday is true.

13. (1)

On Mondays, Only Dimple could not work alone or with any of the nurses.

14. (3)

Chaiya should work on Wednesday.

Two nurses work on Tuesdays, Wednesdays and Thursdays.

18. (2)

Consecutive – Following each other without a break.

19. (3)

Annoy – to trouble and cause irritation.

20. (1)

$$\begin{array}{rcl}
 10000.101 & & \\
 \times 2^{-3} = \frac{1}{2^3} & = & 0.125 \\
 \times 2^{-2} & = & 0 \\
 \times 2^{-1} & = & 0.5 \\
 \times 2^0 & = & 0 \\
 \times 2^1 & = & 0 \\
 \times 2^2 & = & 0 \\
 \times 2^3 & = & 0 \\
 \times 2^4 & = & 16 \\
 \hline
 \therefore 10000.101 & = & 16 + 0.5 + 0.125 \\
 & = & 16.625
 \end{array}$$

Similarly

$$\begin{array}{rcl}
 1100.001 & & \\
 \times 2^{-3} = \frac{1}{2^3} & = & 0.125 \\
 \times 2^{-2} & = & 0 \\
 \times 2^{-1} & = & 0 \\
 \times 2^0 & = & 0 \\
 \times 2^1 & = & 0 \\
 \times 2^2 & = & 4 \\
 \times 2^3 & = & 8 \\
 \hline
 1100.001 & = & 8 + 4 + 0.125 \\
 & = & 12.125 \\
 \therefore 10000.101 + 1100.001 & = & 16.625 + 12.125 \\
 & = & 28.75
 \end{array}$$

21. (2)

Average of 24 innings = 24

∴ Total of 24 innings = $24 \times 24 = 576$

Average of 25 innings must be 25

∴ Total of 25 innings = $25 \times 25 = 625$

∴ Runs to be scored in 25th innings to get

an average of 25 is = $625 - 576 = 49$

22. (3)

Weight of Ist ornament
= 18 gm

Weight of gold

$$= \frac{2}{(2+1)} \times 18$$

$$= 12 \text{ gm}$$

∴ Weight of silver = 6 gm

∴ Amount of gold in the new ornament in gms

$$= 12 + 20 = 32 \text{ gms.}$$

Weight of IInd ornament
= 24 gm

Weight of gold

$$= \frac{5}{(5+1)} \times 24$$

$$= 20 \text{ gm}$$

∴ Weight of silver = 4 gm

23. (4)

LCM of ratios of water

(i.e.) LCM of 5 : 2

Milk : Water

$$\text{New ratio} = 3 : 2 = 15 : 10$$

$$\text{Old ratio} = 7 : 5 = 14 : 10$$

$$\text{Difference} = 1 : 0$$

$$\begin{aligned} \therefore \text{Milk added} &= \frac{1}{(14+10)} \times 48 \\ &= \frac{1}{24} \times 48 = 2 \text{ litres} \end{aligned}$$

24. (2)

$$\text{New solution} = 75\% \text{ of } 10$$

$$= \frac{75}{100} \times 10$$

Let the % of salt in new solution be x

$$\text{then } \frac{x}{100} \times 7.5 = \frac{150}{1000}$$

$$\therefore x = \frac{15}{7.5} = 2.0\%$$

25. (2)

Given series : 2, 9, 16, 23, 30, 37,

$$\text{Consider } 7n+2$$

$$\text{For } n = 0 ; 7n+2 \text{ becomes } 2$$

$$\text{For } n = 1 ; 7n+2 \text{ becomes } 9$$

$$\text{For } n = 2 ; 7n+2 \text{ becomes } 16$$

$$\text{For } n = 3 ; 7n+2 \text{ becomes } 23$$

$$\text{For } n = 4 ; 7n+2 \text{ becomes } 30 \text{ and so on}$$

$\therefore$ Of the given options 1255 is in the form of

$$7(179)+2$$

$$\text{(i.e.) } 7n+2$$

26. (4)

$$225 = 3^2 \times 5^2$$

$$250 = 2 \times 5^3$$

$$260 = 2^2 \times 5 \times 13$$

$$\therefore \text{GCD} = 5$$

Required number of packets

$$= \frac{225}{5} + \frac{250}{5} + \frac{260}{5}$$

$$= 45 + 50 + 52 = 147$$

27. (4)

Let total paint required be x kg.

$$\text{then } 80\% \text{ of } x = 480$$

$$\Rightarrow \frac{80}{100} \times x = 480$$

$$\therefore x = \frac{480 \times 100}{80} = 600 \text{ kg.}$$

$$\therefore \text{Cost} = \frac{600}{25} \times 250 = \text{Rs. } 6,000$$

Directions (28–30) :

Criteria	Exceptions	Captain T	Jawan E	Major W	Col. P	Captain Y
Army Officer	Must have won at least 2 gallantry awards [Meet Gen.C]		✓			
below 40 years of age	Between 40–45 [Meet Gen. J]	✓	✓	✓	To meet Gen. J	✓
Graduate of NDA	Passed out IMA and been in the top of class of IMA [Give a leadership exam]	✗	✓	✓	✓	✓
Passed Commando course in the past 2 years	If not taken before 2 yrs. [go through a fitness test]	✓	✓	✓	✓	✗

28. (1)

29. (2)

30. (4)

31. (2)

$$C \xrightarrow{+1} D$$

$$O \xrightarrow{+2} Q$$

$$D \xrightarrow{+3} G$$

$$E \xrightarrow{+4} I$$

$$S \xrightarrow{+5} X$$

Similarly,

L $\xrightarrow{+1}$ M
O $\xrightarrow{+2}$ Q
G $\xrightarrow{+3}$ J
I $\xrightarrow{+4}$ M
C $\xrightarrow{+5}$ H

$\therefore$ Code for LOGIC is "MQJMH"

32. (4)

$$\begin{aligned}n(A) &= 20\% \\n(B) &= 30\% \\n(A \cup B) &= 100 - 50\% = 50\% \\n(A \cup B) &= n(A) + n(B) - n(A \cap B) \\50 &= 20 + 30 - n(A \cap B) \\\therefore n(A \cap B) &= 50 - 50 = 0\%\end{aligned}$$

Therefore there is no student dislike teacher A and B.

Directions (33–35) :

Book	Geology	Maths	Physics	Chemistry	Zoology
A	x	x	✓	x	x
B	✓	x	x	x	x
C	x	✓	x	x	x
D	x	x	x	✓	x
E		x		x	✓

33. (3)

C is the maths book.

34. (3)

E is the Zoology book.

35. (1)

A is the physics book.

Directions (36–37) :

36. (1)

$$\begin{aligned}\text{Sum of the numbers} &= 2+7+5+3+4+8+6 \\&= 35 \\ \text{No. of symbols} &= * ! \$ = \# @ ! \$ \\&= 8 \\\therefore \text{Difference} &= 35 - 8 = 27\end{aligned}$$

37. (2)

No. of letters are immediately followed by a symbol in the given series are
\$A, #N, !N, \$G
(i.e.) 4 in numbers.

Directions (38–41) :

38. (2)

Possibility : I

E C A F D B
1 2 3 4 5 6

Possibility : II

E D B F C or A
1 2 3 4 5 6

$\therefore$ D cannot deliver fifth lecture.

39. (3)

From the above two cases D or C can deliver lecture just after E.

40. (2)

Refer : Possibility I;
D's lecture must follow F's lecture if C is tyhe second.

41. (1)

E D B F A C
1 2 3 4 5 6

C will deliver the sixth lecture.

51. (3)

First 2 consecutive 3 hrs.

excess of water = 40000

Third, 3 hrs. water spent

$$\begin{aligned}&= 40000 + 30000 - 45000 \\&= 25000\end{aligned}$$

$$\begin{aligned}\text{Fourth 3 hrs. water} &= 25000 + 30000 - 25000 \\&= 30000\end{aligned}$$

$$\begin{aligned}\text{Fifth} &= 30000 + 30000 - 40000 \\&= 20000\end{aligned}$$

$$\begin{aligned}\text{Sixth} &= 20000 + 30000 - 15000 \\&= 35000\end{aligned}$$

$$\begin{aligned}\text{Seventh} &= 35000 + 30000 - 60000 \\ &= 5000\end{aligned}$$

$$\begin{aligned}\text{Eighth} &= 5000 + 30000 - 35000 \\ &= 0\end{aligned}$$

$$\begin{aligned}\therefore \text{Maximum capacity} &= 40000 \text{ litres} \\ \text{i.e.} &= 40\end{aligned}$$

52. (*)

Given data are not correct.

53. (2)

A B C E

A B C D

A B D E

Minimum members = A, B, C, D, E

Total = 5

54. (2)

Let the capacity of first bottle be x .

Capacity of second bottle = $2x$

$$\text{Oil in first bottle} = \frac{x}{2}$$

$$\text{Oil in second bottle} = \frac{2x}{4} = \frac{x}{2}$$

$$\text{Total oil} = \frac{x}{2} + \frac{x}{2} = x$$

Capacity of third bottle = $x + 2x = 3x$

$$\text{Fraction of oil in third bottle} = \frac{x}{3x} = \frac{1}{3}$$

55. (4)

Let Don's annual income = Rs. 10,000

8% annual raise = Rs. 800

Wife's annual income = Rs. 10,500

8% of annual raise = Rs. 840

After raise Don receives = Rs. 10,800

After raise wife receives = Rs. 11,340

$$\therefore \text{Difference} = \text{Rs. } 540$$

56. (1)

7 Pine apples = Rs. 203

$$1 \text{ Pine apples} = \frac{203}{7} = \text{Rs. } 29$$

$$\boxed{7 \text{ apples} = 3 \text{ pine apples}} \text{ given}$$

$$\therefore 7 \text{ apples} = 29 \times 3$$

$$1 \text{ apple} = \frac{29 \times 3}{7}$$

$$\boxed{4 \text{ apples} = 5 \text{ oranges}} \text{ given}$$

$$\therefore 5 \text{ oranges} = \frac{29 \times 3 \times 4}{7}$$

$$\therefore 1 \text{ orange} = \frac{29 \times 3 \times 4}{7 \times 5}$$

$$\therefore 8 \text{ oranges} = \frac{29 \times 3 \times 4 \times 8}{7 \times 5}$$

$$\boxed{5 \text{ tomatoes} = 8 \text{ oranges}} \text{ given}$$

$$\therefore 1 \text{ tomatoes} = \frac{29 \times 3 \times 4 \times 8}{7 \times 5 \times 5}$$

$$= 15.90$$

$\therefore$ Approximate price of 1 Tomato = Rs. 16

58. (3)

The Heart of the Computer is the Central Processing Unit.

(i.e.) CPU

59. (2)

DOS – Disk Operating System

MS DOS– Microsoft Disk Operating System

60. (1)

Ctrl–Alt–Del is a computer key board command on PC Systems that can be used to reboot the Computer and summon the task manager or window security in more recent versions of the Microsoft Window Operating System.

61. (2)

Microsoft word help us

- i) to type letters or documents or creating tables.
- ii) to edit, format, alignment of text/document/tables.
- iii) for spell checking, text transfer/adding/removing text.
- iv) for grammatical check and printing.

63. (1)

The earliest calculating devices are

Abacus : The Abacus was the first portable calculating device, presumably invented to help tax collections do math while on the go.

64. (3)

The man who built the first Mechanical Calculator was

Blaise Pascal – A mechanical calculator was a device used to perform the basic operations of arithmetic. It was invented in 1642 by Blaise Pascal.

65. (4)

Punched cards were first introduced by

Herman Hollerith – in 188 × for the purpose of tabulating the results of the census.

66. (1)

A and B are independent then

$$P(A \cap B) = P(A) \cdot P(B)$$

Now A is independent to itself

$$\Rightarrow P(A \cap A) = P(A) \cdot P(A)$$

$$P(A) = P(A) \cdot P(A)$$

$$\therefore P(A) = 1$$

67. (2)

$$x + y = 200$$

$$y = 200 - x$$

$$f(x) = xy = x(200 - x)$$

$$= 200x - x^2$$

$$f'(x) = 200 - 2x$$

$$f''(x) = -2$$

$$f'(x) = 0 \Rightarrow 200 - 2x = 0$$

$$2x = 200$$

$$x = 100$$

$$\text{when } x = 100$$

$$f''(100) = -2 < 0$$

$$\therefore x = 100 \text{ gives maximum}$$

$$y = 200 - x = 200 - 100 = 100$$

$$\text{Maximum product} = 100 \times 100 = 10000$$

68. (4)

$$\text{Slope} = 3x^2$$

$$\frac{dy}{dx} = 3x^2$$

$$dy = 3x^2 dx$$

$$\int dy = 3 \int x^2 dx$$

$$y = 3 \left(\frac{x^3}{3} \right) + c$$

$$y = x^3 + c \quad \dots (1)$$

(1) passes through (1, -1)

$$(1) \Rightarrow -1 = 1 + c$$

$$c = -2$$

$$\therefore (1) \Rightarrow y = x^3 - 2$$

69. (1)

A semi-group (S, *) having more than one idempotent element cannot be a group is true statement.

Proof :

Let us assume that (S, *) is a group and $x \neq e$ is any idempotent element

$$\text{Hence } x * x = x$$

$$\text{Again } x^{-1} \in S$$

$$\text{Hence } (x * x) * x^{-1} = x * x^{-1}$$

$$\Leftrightarrow x = e$$

which is a contradiction.

71. (3)

$$\text{Area} = \pi r^2 = 25\pi$$

$$\therefore r^2 = 25$$

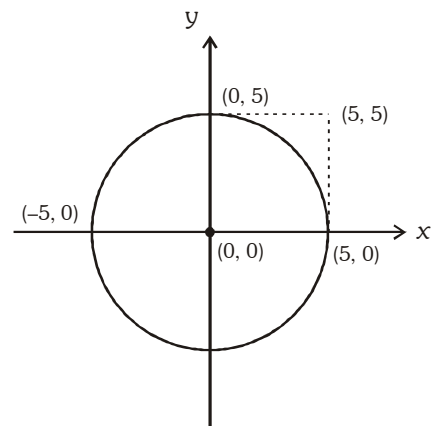
$$r = 5$$

Center is (0, 0)

$\therefore$ Equation of the sphere

$$(x-0)^2 + (y-0)^2 = 5^2$$

$$\Rightarrow x^2 + y^2 = 25$$



The circle will not pass through (5, 5).

72. (1)

No. of rows of desks = r

desks in each row = d

$\therefore$ The number of pupils in the class = dr

$\therefore$ No. of pupils in the class with 3 seats are left vacant = dr - 3

73. (1)

% reduction in the width

$$\begin{aligned}
&= \frac{R}{100+R} \times 100 \\
&= \frac{50}{100+50} \times 100 \\
&= \frac{50}{150} \times 100 = 33.33\%
\end{aligned}$$

74. (3)

$$\begin{aligned}
\text{Circumference} &= 2\pi r \\
&= 2\pi \times 0.5 = \pi \text{ metre}
\end{aligned}$$

$$\text{Number of Revolution per kilometer} = \frac{1000}{\pi}$$

75. (4)

$$\begin{aligned}
\text{Average} &= \frac{5+10+15+X}{4} = 20 \\
30+X &= 4 \times 20 = 80 \\
\therefore X &= 80-30 \\
&= 50
\end{aligned}$$

76. (4)

$$\begin{array}{r|l}
3 & 255 \\
5 & 85 \\
17 & 17 \\
\hline
& 1
\end{array}$$

$$\therefore 255 = 3 \times 5 \times 17$$

Largest prime factor = 17

77. (4)

$$\begin{array}{ccc}
5 & : & 4 \\
\searrow & \uparrow & \searrow \\
& 6 & : & 7
\end{array}$$

$$\begin{aligned}
A : B : C &= 5 \times 6 : 6 \times 4 : 4 \times 7 \\
&= 15 : 12 : 14
\end{aligned}$$

85. (4)

Since complex roots always occur in conjugate pairs.

(i.e.) if $2i$ is a root then $-2i$ is also a root.

$\therefore$ If $i\alpha$ is a root, $-i\alpha$ is also a root is true statement.

86. (2)

$$x^2 + x + 6x + 5 + 1 = x^2 + 7x + 6 = 0$$

$$\alpha + \beta = \frac{-b}{a} = \frac{-7}{1} = -7$$

87. (2)

Consider option (2)

$$\begin{aligned}
ax^2 - bx + c &= a\left(\frac{-c}{a}\right)^2 - b\left(\frac{-c}{a}\right) + c \\
&= \frac{c^2}{a} + \frac{bc}{a} + c \\
&= c\left[\frac{c+b+a}{a}\right] = 0 \\
&= [\because a+b+c=0]
\end{aligned}$$

$\therefore \frac{-c}{a}$ is a root.

88. (1)

$$a^3 - b^3 = (a-b)(a^2 + ab + b^2) \quad \dots (1)$$

$a^3 - b^3$ is a prime number

implies $(a-b) = 1$ (or)

$$a^2 + ab + b^2 = 1$$

Since a and b are positive integers implies

$$a^2 + ab + b^2 \neq 1$$

$$\therefore (a-b) = 1$$

$\therefore (1) \Rightarrow$

$$a^3 - b^3 = (a^2 + ab + b^2)$$

89. (2)

$$\text{Angle traced by the hr. hand in 12 hrs.} = 360$$

$$\begin{aligned}
\therefore \text{Angle traced by it in 0 hrs 30 min.} &= \frac{360}{12} \times \frac{1}{2} \\
&= 15^\circ
\end{aligned}$$

$$\text{Angle traced by minute hand in 60 min.} = 360$$

$$\therefore \text{Angle traced by it in 30 min.} = 180^\circ$$

$$\begin{aligned}
\therefore \text{Required angle} &= 180 - 15 \\
&= 165^\circ
\end{aligned}$$

91. (2)

The numbers between 100 to 300
which are divisible by 3 are
102, 105, 108, ..., 297
consider $102 + 105 + 108 + \dots + 297$

$$\text{no. of terms} = \left(\frac{\ell - a}{d} \right) + 1$$

$$\ell = 297 ; a = 102 ; d = 3$$

$$\begin{aligned} \text{no. of terms} &= \left(\frac{297 - 102}{3} \right) + 1 \\ &= \frac{195}{3} + 1 = 65 + 1 = 66 \end{aligned}$$

92. (3)

Among all planar shapes with the same
circumference the circle has the largest area.

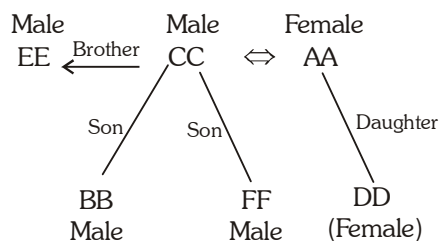
93. (2)

$$2 < r < 8$$

$$1 < s < \frac{5}{2}$$

$$\begin{aligned} \text{Multiply} \quad 2 \times 1 &< rs < 8 \times \frac{5}{2} \\ \Rightarrow 2 &< rs < 20 \end{aligned}$$

Direction (94-98) :



94. (4)

Males : CC, EE, BB, FF

95. (1)

AA is mother of BB.

96. (3)

AA has three children.

97. (2)

EE - CC and

BB - FF are brother - brother pair.

98. (3)

EE is the uncle of DD.

99. (3)

$f(x)$ is not differentiable at infinite number of
points.

100. (2)

$$f(x) = 2\log(x-2) - x^2 + 4x + 1$$

$$f'(x) = \frac{2}{(x-2)} - 2x + 4$$

$$f'(x) = 0 \Rightarrow \frac{2}{x-2} - 2x + 4 = 0$$

$$\frac{2}{x-2} = \frac{2(x-2)x - 4(x-2)}{(x-2)}$$

$$x(x-2) - 2(x-2) - 1 = 0$$

$$x^2 - 2x - 2x + 4 - 1 = 0$$

$$x^2 - 4x + 3 = 0$$

$$x = \frac{4 \pm \sqrt{16 - 12}}{2}$$

$$= \frac{4 \pm 2}{2} = 3, 2$$

$$x = 3, 2$$

$$\Rightarrow x \in (2, 3)$$