aglasem.com
ADMISSION

MAH MCA CET Sample Paper 2027

Maharashtra MCA Common Entrance Test · Practice Paper 1

Questions	Marks	Time	Negative marking
100 MCQs	**200 (2 each)**	**90 minutes**	**None**

Part	Section	Questions	Q. No.
Part A	Mathematics and Statistics	30	1 to 30
Part B	Logical / Abstract Reasoning	30	31 to 60
Part C	English Comprehension and Verbal Ability	20	61 to 80
Part D	Computer Concepts	20	81 to 100

Instructions

1. There are 100 multiple-choice questions in four sections, each with four options. Choose the one correct answer.
2. Each question carries 2 marks. There is no negative marking, so attempt every question.
3. Attempt the whole paper in one sitting of 90 minutes, as in the online exam. Calculators are not allowed.
4. The answer key and short solutions are at the end. Check them only after you finish.

This is an AglaSem practice paper written on the official MAH MCA CET pattern and syllabus (100 questions, 200 marks, 90 minutes). It is not an official State CET Cell, Maharashtra paper, and its questions are original.

Part A

Mathematics and Statistics

1. If $\log_2 x + \log_2(x - 2) = 3$, then x equals:

(A) 6 (B) 4
(C) 8 (D) –2

2. The sum of the first 20 terms of the AP 3, 7, 11, 15, … is:

(A) 840 (B) 780
(C) 820 (D) 800

3. The sum to infinity of the GP 6 + 2 + 2/3 + 2/9 + … is:

(A) 12 (B) 18
(C) 9 (D) 8

4. The coefficient of x^3 in the expansion of $(1 + 2x)^6$ is:

(A) 240 (B) 120
(C) 20 (D) 160

5. In how many distinct ways can the letters of the word LEVEL be arranged?

(A) 60 (B) 120
(C) 20 (D) 30

6. A committee of 3 men and 2 women is to be formed from 6 men and 5 women. The number of ways is:

(A) 150 (B) 462
(C) 200 (D) 300

7. If α and β are the roots of $x^2 - 5x + 6 = 0$, then $\alpha^2 + \beta^2$ equals:

(A) 13 (B) 11

(C) 25 (D) 19

8. If $f(x) = 2x + 3$ and $g(x) = x^2$, then $(f \circ g)(2)$ equals:

(A) 19 (B) 7

(C) 11 (D) 49

9. The centre and radius of the circle $x^2 + y^2 - 6x + 8y = 0$ are:

(A) $(-3, 4)$ and 5 (B) $(3, -4)$ and 5

(C) $(6, -8)$ and 10 (D) $(3, -4)$ and 25

10. The equation of the line through $(1, 2)$ and perpendicular to $2x + 3y = 6$ is:

(A) $3x - 2y + 1 = 0$ (B) $3x + 2y - 7 = 0$

(C) $2x + 3y - 8 = 0$ (D) $2x - 3y + 4 = 0$

11. The focus of the parabola $y^2 = 12x$ is:

(A) $(0, 3)$ (B) $(3, 0)$

(C) $(-3, 0)$ (D) $(12, 0)$

12. The eccentricity of the ellipse $x^2/25 + y^2/16 = 1$ is:

(A) 3/5 (B) 4/5

(C) 3/4 (D) 5/3

13. The value of $\tan^{-1}1 + \tan^{-1}2 + \tan^{-1}3$ is:

(A) $\pi/2$ (B) 2π

(C) $3\pi/4$ (D) π

14. From a point 30 m from the foot of a tower, the angle of elevation of its top is $60°$. The height of the tower is:

(A) $30\sqrt{3}$ m (B) 15 m

(C) 60 m (D) $10\sqrt{3}$ m

15. The number of solutions of $\sin 2x = \sin x$ in the interval $[0, 2\pi]$ is:

(A) 3 (B) 6

(C) 5 (D) 4

16. In a triangle with sides 7 cm, 5 cm and 3 cm, the largest angle is:

(A) $135°$ (B) $120°$

(C) $90°$ (D) $150°$

17. The integrating factor of the differential equation $dy/dx + (2/x)y = x$ is:

(A) x^2 (B) $2 \log x$

(C) e^{2x} (D) $1/x^2$

18. The order and degree of the differential equation $(d^2y/dx^2)^3 + (dy/dx)^4 + y = 0$ are:

(A) Order 2, degree 3 (B) Order 2, degree 4

(C) Order 4, degree 3 (D) Order 3, degree 2

19. The general solution of $d^2y/dx^2 - 5\,dy/dx + 6y = 0$ is:

(A) $y = (c_1 + c_2x)e^{3x}$ (B) $y = c_1e^{-2x} + c_2e^{-3x}$

(C) $y = c_1e^{6x} + c_2e^{-x}$ (D) $y = c_1e^{2x} + c_2e^{3x}$

20. Two fair dice are thrown. The probability that the sum of the numbers is 8 is:

(A) 1/9 (B) 1/6

(C) 5/36 (D) 7/36

21. A bag has 4 red and 6 black balls. Two balls are drawn one after another without replacement. The probability that both are red is:

(A) 8/45 (B) 1/3

(C) 4/25 (D) 2/15

22. For a binomial distribution with n = 10 and p = 0.4, the mean and variance are:

(A) Mean 4, variance 2.4 (B) Mean 6, variance 2.4

(C) Mean 4, variance 6 (D) Mean 4, variance 1.6

23. If X follows a Poisson distribution with mean 2, then P(X = 2) is:

(A) $2e^{-2}$ (B) $(4/3)e^{-2}$

(C) e^{-2} (D) $4e^{-2}$

24. The standard deviation (population) of the data 2, 4, 4, 4, 5, 5, 7, 9 is:

(A) 4 (B) 2

(C) 1.5 (D) 2.5

25. If the regression coefficients are b_yx = 0.8 and b_xy = 0.45, the correlation coefficient r is:

(A) 0.8 (B) 0.6

(C) 0.36 (D) 1.25

26. A right circular cone has radius 7 cm and height 24 cm. Its total surface area is (take π = 22/7):

(A) 1232 cm^2 (B) 550 cm^2

(C) 858 cm^2 (D) 704 cm^2

27. A can finish a job in 12 days and B in 18 days. Working together, they will finish it in:

(A) 15 days (B) 7.2 days

(C) 6 days (D) 7.5 days

28. A train 240 m long, running at 54 km/h, crosses a platform 360 m long in:

(A) 24 seconds (B) 44 seconds

(C) 40 seconds (D) 16 seconds

29. The price of sugar rises by 25%. By what percentage must a family cut its consumption to keep its spending the same?

(A) 15% (B) 25%

(C) 22.5% (D) 20%

30. Of 60 students, 35 like tea, 30 like coffee and 10 like neither. How many like both?

(A) 5 (B) 10

(C) 20 (D) 15

Part B

Logical / Abstract Reasoning

31. Find the next number in the series: 2, 6, 12, 20, 30, ?

(A) 44 (B) 36

(C) 40 (D) 42

32. Find the next number in the series: 5, 11, 23, 47, 95, ?

(A) 189 (B) 192

(C) 190 (D) 191

33. Find the next letter in the series: B, E, I, N, ?

(A) U (B) T

(C) S (D) R

34. Find the next term: AZ, CX, EV, GT, ?

(A) IR (B) IS

(C) HR (D) JR

35. In a certain code, MANGO is written as NBOHP. How is APPLE written in that code?

(A) BQPMF (B) BQQMF

(C) ZOOKD (D) BQQME

36. If CAT = 24 in a code where each letter takes its alphabet position (A = 1, B = 2, …), what is DOG?

(A) 28 (B) 26

(C) 27 (D) 25

37. In a code, FRIEND is written as HUMJTK. How is CANDLE written in that code?

(A) ECRIRL (B) EDRIRL

(C) EDRJRL (D) EDQIRL

38. Pointing to a man, Riya says, "He is the son of my grandfather's only son." How is the man related to Riya?

(A) Cousin (B) Uncle

(C) Brother (D) Nephew

39. A is the sister of B. C is the mother of B. D is the father of C. E is the mother of D. How is A related to D?

(A) Niece (B) Granddaughter

(C) Grandmother (D) Daughter

40. Ravi walks 10 m north, turns right and walks 6 m, turns right and walks 18 m, then turns left and walks 9 m. How far and in which direction is he from his starting point?

(A) 17 m, South-East (B) 23 m, South-West

(C) 17 m, North-East (D) 15 m, South-East

41. A man faces north. He turns 90° clockwise, then 135° anticlockwise, and then 180° clockwise. Which direction does he face now?

(A) South-East (B) North-West

(C) North-East (D) South-West

42. Statements: All pens are books. Some books are bags. Conclusions: I. Some pens are bags. II. Some bags are books. Which conclusion(s) follow?

(A) Both I and II follow (B) Only II follows

(C) Only I follows (D) Neither I nor II follows

43. Statements: No cat is a dog. All dogs are animals. Conclusions: I. Some animals are not cats. II. No cat is an animal. Which conclusion(s) follow?

(A) Neither I nor II follows (B) Both I and II follow

(C) Only I follows (D) Only II follows

44. Five friends P, Q, R, S and T sit in a row facing north. S sits in the middle. P sits at the extreme left. T sits immediately to the right of S. Q is not a neighbour of P. Who sits between P and S?

(A) No one
(B) Q
(C) T
(D) R

45. Six people A, B, C, D, E and F sit around a round table facing the centre. A is opposite D. B is to the immediate left of A. C is opposite B. E is not a neighbour of A. Who is to the immediate right of A?

(A) E
(B) F
(C) C
(D) B

46. 8 : 512 :: 6 : ?

(A) 216
(B) 256
(C) 196
(D) 36

47. Find the odd one out: 121, 169, 225, 289, 323

(A) 169
(B) 225
(C) 323
(D) 289

48. Find the odd letter group: BDF, HJL, MOQ, RTW

(A) BDF
(B) HJL
(C) MOQ
(D) RTW

49. If 1 January 2027 is a Friday, what day of the week is 1 March 2027?

(A) Wednesday
(B) Monday
(C) Tuesday
(D) Sunday

50. What is the angle between the hour hand and the minute hand of a clock at 4:20?

(A) 10°
(B) 0°
(C) 5°
(D) 20°

51. In a row of 40 students, Amit is 15th from the left end. What is his position from the right end?

(A) 24th
(B) 27th
(C) 25th
(D) 26th

52. A cube painted red on all faces is cut into 64 equal small cubes. How many small cubes have exactly two faces painted?

(A) 32
(B) 24
(C) 8
(D) 16

53. In a 3 × 3 grid the rows read (2, 3, 13), (4, 5, 41) and (6, 1, ?). The same rule holds in each row. Find the missing number.

(A) 43
(B) 35
(C) 38
(D) 37

54. If '+' means '×', '×' means '−', '−' means '÷' and '÷' means '+', find the value of 8 + 4 − 2 ÷ 6 × 3.

(A) 19
(B) 17
(C) 21
(D) 13

55. Statement: An advertisement says, "Use SparkWhite toothpaste for whiter teeth." Assumptions: I. People want whiter teeth. II. SparkWhite is the cheapest toothpaste. Which is implicit?

(A) Both I and II are implicit
(B) Neither I nor II is implicit
(C) Only II is implicit
(D) Only I is implicit

56. What is P's age? Statement I: P is 5 years older than Q. Statement II: Q's age is half of R's age, and R is 30. Which is enough to answer?

(A) Statement II alone is enough

(B) Statement I alone is enough

(C) Both statements together are needed

(D) Even both together are not enough

57. In a sequence of figures, the 1st is a square with 1 dot inside, the 2nd a pentagon with 2 dots and the 3rd a hexagon with 3 dots. What is the 4th figure?

(A) An octagon with 4 dots

(B) A heptagon with 3 dots

(C) A hexagon with 4 dots

(D) A heptagon with 4 dots

58. An arrow points north. In each step it turns 45° clockwise and then 90° anticlockwise. Where does it point after 4 steps?

(A) East

(B) North

(C) South

(D) West

59. How many pairs of letters in the word MOBILE have as many letters between them in the word as in the English alphabet?

(A) Three

(B) Four

(C) One

(D) Two

60. If $P > Q \geq R = S < T$, which of the following is definitely true?

(A) $T > Q$

(B) $P > S$

(C) $S > T$

(D) $Q > T$

Part C

English Comprehension and Verbal Ability

Read the passage and answer the next four questions:

Every generation fears that a new technology will ruin the habit of reading. Printed novels were once blamed for distracting the young, and television was later accused of the same crime. Today the worry has shifted to smartphones. Yet the evidence suggests that people are not reading less; they are reading differently. We skim headlines, scroll through feeds and jump between short messages, often reading thousands of words a day without retaining much of them.

The real loss, researchers argue, is not reading itself but deep reading: the slow, patient attention that lets a reader follow a long argument, notice a contradiction or enter the mind of a character. This kind of attention is not natural; it is built through practice, much like a muscle. A brain trained only on quick bursts of text finds a dense chapter tiring and gives up early.

The remedy is not to reject screens but to make room for sustained reading. Setting aside a fixed, uninterrupted half hour each day, reading on paper when possible, and pausing to summarise what has been read can slowly rebuild the capacity for deep attention.

61. According to the passage, what has changed in the digital age?

(A) Printed books are no longer easily available

(B) People have almost completely stopped reading books

(C) Television has largely replaced reading at home

(D) The way people read, rather than how much they read

62. The author compares deep reading to a muscle in order to suggest that it:
(A) cannot be lost once it is learnt
(B) is a natural ability present from birth
(C) is harmful when it is overused
(D) becomes stronger with regular practice

63. Which of the following does the author recommend?
(A) Giving up smartphones and the internet completely
(B) Setting aside uninterrupted time for reading every day
(C) Avoiding long chapters and difficult books altogether
(D) Reading only headlines and summaries to save time

64. The word 'sustained', as used in the passage, most nearly means:
(A) interrupted again and again
(B) happening only now and then
(C) continued over a long period
(D) forced on someone unwillingly

65. Choose the word closest in meaning to METICULOUS.
(A) Painstaking
(B) Careless
(C) Generous
(D) Hasty

66. Choose the word closest in meaning to EPHEMERAL.
(A) Ancient
(B) Short-lived
(C) Heavenly
(D) Permanent

67. Choose the word opposite in meaning to BENEVOLENT.
(A) Malevolent
(B) Charitable
(C) Generous
(D) Kind

68. Choose the word opposite in meaning to TACITURN.
(A) Reserved
(B) Talkative
(C) Silent
(D) Gloomy

69. Choose the grammatically correct sentence.
(A) Neither the manager or the employees were present at the meeting.
(B) Neither the manager nor the employees was present at the meeting.
(C) Neither the manager nor the employees were present at the meeting.
(D) Neither the manager nor the employees is present at the meeting yesterday.

70. Fill in the blank: He has been living in Pune ___ 2019.
(A) by
(B) from
(C) since
(D) for

71. Fill in the blank: If I ___ you, I would accept the offer.
(A) will be
(B) am
(C) were
(D) had been

72. Fill in the blank: Hardly had I reached the station ___ the train left.
(A) when
(B) then
(C) that
(D) than

73. Choose the sentence in which the articles are used correctly.

(A) She is a honest woman and a university lecturer.

(B) She is a honest woman and an university lecturer.

(C) She is an honest woman and a university lecturer.

(D) She is an honest woman and an university lecturer.

74. Fill in the blank: The teacher insisted ___ punctuality.

(A) at (B) for

(C) with (D) on

75. What does the idiom 'to burn the midnight oil' mean?

(A) To waste money carelessly on small things

(B) To start a quarrel without any reason

(C) To work or study late into the night

(D) To lose one's temper over something minor

76. What does the idiom 'a blessing in disguise' mean?

(A) Something that seems bad at first but proves useful

(B) A gift that is given to someone secretly

(C) A prayer that is said quietly in silence

(D) A danger that stays hidden until too late

77. Choose the one word for: a person who can speak two languages fluently.

(A) Polyglot (B) Bipartisan

(C) Linguist (D) Bilingual

78. Choose the correctly spelt word.

(A) Accommodation (B) Accomodation

(C) Acomodation (D) Acommodation

79. Arrange the sentences in a logical order. P: Within weeks, sales of the product doubled. Q: A small company noticed that customers struggled to open its packaging. R: It redesigned the box so that it opened with a single pull. S: Encouraged, the company began asking customers for feedback on every product.

(A) SQRP (B) QPRS

(C) QRPS (D) RQPS

80. Arrange the sentences in a logical order. P: As a result, groundwater levels in many districts have fallen sharply. Q: Farmers in these districts now drill ever deeper borewells. R: Over the last few decades, rainfall in parts of the Deccan has become less reliable. S: This, in turn, lowers the water table further, creating a vicious circle.

(A) RQPS (B) RPQS

(C) QRPS (D) PRQS

Part D

Computer Concepts

81. The binary number $(1011.101)_2$ in decimal is:

(A) 11.5 (B) 13.625

(C) 11.25 (D) 11.625

82. The hexadecimal number $(2AF)_{16}$ in decimal is:

(A) 687 (B) 2175

(C) 697 (D) 671

83. The 8-bit two's complement representation of −45 is:

(A) 11010010 (B) 00101101

(C) 11010011 (D) 10101101

84. The range of integers that can be stored in 8-bit two's complement form is:

(A) −128 to +127 (B) −127 to +127

(C) −128 to +128 (D) 0 to 255

85. The product of the binary numbers 1101 and 101 is:

(A) 1000001 (B) 111001

(C) 1100001 (D) 1000011

86. The Boolean expression A + A'B simplifies to:

(A) A + B (B) A' + B

(C) AB (D) A

87. What is the output of the C statement printf("%d", 12 & 10 | 1); ?

(A) 9 (B) 11

(C) 15 (D) 8

88. What is the minimum number of 2-input NAND gates needed to build an OR gate?

(A) 1 (B) 3

(C) 2 (D) 4

89. The number 13.25 written in normalised binary floating-point form $1.f \times 2^e$ is:

(A) 11.0101×2^2 (B) 1.101×2^3

(C) 1.10101×2^4 (D) 1.10101×2^3

90. The program that translates assembly language into machine code is called:

(A) A loader (B) An assembler

(C) A linker (D) A compiler

91. Which method transfers a block of data between an I/O device and main memory without the CPU handling each word?

(A) Programmed I/O (B) Interrupt-driven I/O

(C) Direct Memory Access (DMA) (D) Polling

92. Which CPU register holds the address of the next instruction to be fetched?

(A) Instruction register (B) Memory data register

(C) Accumulator (D) Program counter

93. Which of the following has the shortest access time?

(A) Cache memory (B) Hard disk

(C) Main memory (RAM) (D) CPU registers

94. Which of the following is NOT one of the four necessary conditions for a deadlock?

(A) Hold and wait (B) Mutual exclusion

(C) Preemption (D) Circular wait

95. Processes P1, P2 and P3 arrive at time 0 with CPU bursts of 5, 3 and 1 ms. Under Round Robin scheduling with a 2 ms time quantum (order P1, P2, P3), when does P2 finish?

(A) 9 ms
(B) 7 ms
(C) 8 ms
(D) 5 ms

96. Which SQL command removes a table together with its structure and all its data?

(A) DELETE FROM
(B) ALTER TABLE
(C) DROP TABLE
(D) TRUNCATE TABLE

97. How many usable host addresses are there in an IPv4 subnet with prefix /26?

(A) 126
(B) 62
(C) 30
(D) 64

98. What is the output of this C code?

```
int i, s = 0;
for (i = 1; i <= 10; i += 3)
    s += i;
printf("%d", s);
```

(A) 21
(B) 12
(C) 22
(D) 35

99. What is the output of this C code?

```
int arr[] = {10, 20, 30, 40};
int *p = arr;
p += 2;
printf("%d", *p + 1);
```

(A) 40
(B) 31
(C) 11
(D) 21

100. What does this C function return for f(7)?

```
int f(int n) {
    return n <= 1 ? 1 : n * f(n - 2);
}
```

(A) 105
(B) 48
(C) 15
(D) 5040

Answer Key

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

Solutions

Mathematics and Statistics

1. (B) $x(x - 2) = 2^3 = 8$ gives $x^2 - 2x - 8 = 0$, so $x = 4$ or -2; log needs $x > 2$, so $x = 4$.

2. (C) $S = (n/2)[2a + (n - 1)d] = 10 \times (6 + 76) = 820$.

3. (C) $S_\infty = a/(1 - r) = 6/(1 - 1/3) = 6 \times 3/2 = 9$.

4. (D) The term is ${}^6C_3(2x)^3 = 20 \times 8x^3 = 160x^3$.

5. (D) 5 letters with L and E each repeated twice: $5!/(2! \times 2!) = 120/4 = 30$.

6. (C) ${}^6C_3 \times {}^5C_2 = 20 \times 10 = 200$.

7. (A) $\alpha + \beta = 5$, $\alpha\beta = 6$, so $\alpha^2 + \beta^2 = (\alpha + \beta)^2 - 2\alpha\beta = 25 - 12 = 13$.

8. (C) $(f \circ g)(2) = f(g(2)) = f(4) = 2 \times 4 + 3 = 11$. (49 is $g(f(2))$.)

9. (B) Completing squares: $(x - 3)^2 + (y + 4)^2 = 25$, so centre $(3, -4)$, radius 5.

10. (A) The given slope is $-2/3$, so the required slope is $3/2$: $y - 2 = (3/2)(x - 1)$, i.e. $3x - 2y + 1 = 0$.

11. (B) $y^2 = 4ax$ with $4a = 12$ gives $a = 3$, so the focus is $(a, 0) = (3, 0)$.

12. (A) $e = \sqrt{(1 - b^2/a^2)} = \sqrt{(1 - 16/25)} = \sqrt{(9/25)} = 3/5$.

13. (D) $\tan^{-1}2 + \tan^{-1}3 = \pi + \tan^{-1}((2 + 3)/(1 - 6)) = \pi - \pi/4 = 3\pi/4$; adding $\pi/4$ gives π.

14. (A) $h = 30 \times \tan 60° = 30\sqrt{3}$ m.

15. (C) $\sin x(2\cos x - 1) = 0$ gives $x = 0, \pi, 2\pi$ and $x = \pi/3, 5\pi/3$: five solutions.

16. (B) $\cos A = (5^2 + 3^2 - 7^2)/(2 \times 5 \times 3) = -15/30 = -1/2$, so $A = 120°$.

17. (A) IF $= e^{\int 2/x\, dx} = e^{2 \log x} = x^2$.

18. (A) The highest derivative is d^2y/dx^2 (order 2), and its power is 3 (degree 3).

19. (D) The auxiliary equation $m^2 - 5m + 6 = 0$ has roots $m = 2, 3$.

20. (C) The favourable pairs are (2,6), (3,5), (4,4), (5,3), (6,2): 5 out of 36.

21. (D) $P = (4/10) \times (3/9) = 12/90 = 2/15$.

22. (A) Mean $= np = 4$; variance $= npq = 10 \times 0.4 \times 0.6 = 2.4$.

23. (A) $P(X = 2) = e^{-2} \cdot 2^2/2! = 2e^{-2}$.

24. (B) Mean $= 40/8 = 5$; squared deviations sum to 32; variance $= 32/8 = 4$, so SD $= 2$.

25. (B) $r = \sqrt{(b_{yx} \times b_{xy})} = \sqrt{0.36} = 0.6$ (positive, as both coefficients are positive).

26. (D) Slant height $l = \sqrt{(49 + 576)} = 25$; TSA $= \pi r(l + r) = (22/7) \times 7 \times 32 = 704$ cm^2.

27. (B) Together they do $1/12 + 1/18 = 5/36$ per day, so they take $36/5 = 7.2$ days.

28. (C) 54 km/h = 15 m/s; distance = 240 + 360 = 600 m; time = 600/15 = 40 s.

29. (D) Cut = 25/(100 + 25) × 100 = 20%.

30. (D) n(T ∪ C) = 60 − 10 = 50, so n(T ∩ C) = 35 + 30 − 50 = 15.

Logical / Abstract Reasoning

31. (D) The differences are 4, 6, 8, 10, so the next difference is 12: 30 + 12 = 42.

32. (D) Each term is twice the previous term plus 1: 95 × 2 + 1 = 191.

33. (B) The letter positions 2, 5, 9, 14 increase by 3, 4, 5, so add 6: 14 + 6 = 20 = T.

34. (A) The first letter moves forward by 2 (A, C, E, G, I) and the second moves back by 2 (Z, X, V, T, R).

35. (B) Each letter is replaced by the next letter of the alphabet: A→B, P→Q, P→Q, L→M, E→F.

36. (B) CAT = 3 + 1 + 20 = 24, so DOG = 4 + 15 + 7 = 26.

37. (B) The letters move forward by 2, 3, 4, 5, 6, 7: C+2=E, A+3=D, N+4=R, D+5=I, L+6=R, E+7=L.

38. (C) Her grandfather's only son is Riya's father, so the man is her father's son: her brother.

39. (B) A is a daughter of C, and C is D's daughter, so A is D's granddaughter.

40. (A) He ends 6 + 9 = 15 m east and 18 − 10 = 8 m south of the start: $\sqrt{(15^2 + 8^2)}$ = 17 m, South-East.

41. (A) North → East (90° cw) → North-West (135° acw) → South-East (180°).

42. (B) II is the converse of 'Some books are bags' and follows; the pens need not overlap the bags, so I does not follow.

43. (C) The dogs are animals that are not cats, so I follows; cats may still be animals, so II does not follow.

44. (D) The order from left is P, R, S, T, Q, so R sits between P and S.

45. (B) Going clockwise from A: A, B, E, D, C, F. A's neighbours are B (left) and F (right).

46. (A) 512 = 8^3, so the answer is 6^3 = 216.

47. (C) 121, 169, 225 and 289 are squares of 11, 13, 15 and 17; 323 = 17 × 19 is not a perfect square.

48. (D) In BDF, HJL and MOQ each letter moves 2 steps; in RTW the second gap is 3 (T to W).

49. (B) From 1 January to 1 March there are 31 + 28 = 59 days; 59 = 8 weeks + 3 days, and Friday + 3 = Monday.

50. (A) Angle = |30H − 5.5M| = |120 − 110| = 10°.

51. (D) Position from right = 40 − 15 + 1 = 26.

52. (B) The cube is 4 × 4 × 4; two-face cubes lie on the 12 edges, (4 − 2) per edge: 12 × 2 = 24.

53. (D) The third number is the sum of the squares of the first two: $6^2 + 1^2$ = 37.

54. (A) The expression becomes 8 × 4 ÷ 2 + 6 − 3 = 16 + 6 − 3 = 19.

55. (D) The advert assumes people value whiter teeth; it says nothing about price.

56. (C) II gives Q = 15, and I then gives P = 20; neither statement alone gives P's age.

57. (D) Each step adds one side and one dot: 7 sides and 4 dots, a heptagon with 4 dots.

58. (C) Each step is a net 45° anticlockwise turn; 4 steps make 180°, so it points south.

59. (D) The pairs are O–L (two letters between in both) and B–E (two letters between in both).

60. (B) P > Q ≥ R = S gives P > S; the relation between Q and T is not fixed, and S < T.

English Comprehension and Verbal Ability

61. (D) The passage says people are not reading less; they are reading differently.

62. (D) The passage says this attention 'is built through practice, much like a muscle'.

63. (B) The last paragraph suggests a fixed, uninterrupted half hour each day; it says the remedy is not to reject screens.

64. (C) 'Sustained reading' is reading kept up without a break, as opposed to quick bursts.

65. (A) Meticulous means showing great attention to detail, i.e. painstaking.

66. (B) Ephemeral means lasting for a very short time.

67. (A) Benevolent means well-meaning; its opposite is malevolent (wishing harm).

68. (B) Taciturn means saying little; its opposite is talkative.

69. (C) With 'neither … nor', the verb agrees with the nearer subject ('employees'), so 'were'.

70. (C) 'Since' is used with a point of time in the perfect continuous tense.

71. (C) An unreal present condition takes the subjunctive 'were' with 'would'.

72. (A) 'Hardly' is followed by 'when'; 'than' goes with 'no sooner'.

73. (C) 'Honest' begins with a vowel sound (silent h), and 'university' with a 'yoo' consonant sound.

74. (D) The verb 'insist' takes the preposition 'on'.

75. (C) The idiom means to stay up late working or studying.

76. (A) It refers to an apparent misfortune that turns out to be good.

77. (D) Bilingual means speaking two languages; a polyglot speaks many.

78. (A) The correct spelling has double 'c' and double 'm': accommodation.

79. (C) Problem (Q), fix (R), result (P), and then the next step (S).

80. (B) Cause (R), effect (P), the farmers' response in 'these districts' (Q), and the result (S).

Computer Concepts

81. (D) 1011 = 11 and .101 = 1/2 + 1/8 = 0.625, so the value is 11.625.

82. (A) $2 \times 256 + 10 \times 16 + 15 = 512 + 160 + 15 = 687$.

83. (C) 45 = 00101101; invert to 11010010 and add 1 to get 11010011.

84. (A) An n-bit two's complement number ranges from -2^{n-1} to $2^{n-1} - 1$, i.e. –128 to 127.

85. (A) 1101 = 13 and 101 = 5; $13 \times 5 = 65 = (1000001)_2$.

86. (A) $A + A'B = (A + A')(A + B) = 1 \cdot (A + B) = A + B$.

87. (A) & binds tighter than |: 12 & 10 = 8 (1100 & 1010 = 1000), and 8 | 1 = 9.

88. (B) $A + B = (A' \cdot B')'$: two NAND gates make A' and B', and a third NAND combines them.

89. (D) $13.25 = (1101.01)_2$; shifting the point 3 places left gives 1.10101×2^3.

90. (B) An assembler converts assembly mnemonics into machine code; a compiler translates high-level languages.

91. (C) In DMA, a DMA controller moves the data and interrupts the CPU only when the transfer is complete.

92. (D) The program counter (PC) holds the address of the next instruction; the IR holds the current one.

93. (D) Registers sit at the top of the memory hierarchy, inside the CPU.

94. (C) The four conditions are mutual exclusion, hold and wait, no preemption and circular wait.

95. (C) Gantt chart: P1 0–2, P2 2–4, P3 4–5, P1 5–7, P2 7–8 (done), P1 8–9.

96. (C) DROP removes the table definition and data; DELETE and TRUNCATE remove rows but keep the table.

97. (B) A /26 leaves 32 − 26 = 6 host bits: $2^6 - 2 = 62$ usable hosts.

98. (C) i takes the values 1, 4, 7 and 10, so s = 1 + 4 + 7 + 10 = 22.

99. (B) p += 2 points p at arr[2] = 30; *p + 1 = 31 (not *(p + 1), which would be 40).

100. (A) $f(7) = 7 \times f(5) = 7 \times 5 \times f(3) = 7 \times 5 \times 3 \times f(1) = 105$.