

MAHCET MOCK-1

TOTAL QUESTIONS : 100

TIME : 90 MINUTES

SECTION A : MATHS / QUANT

- The angle between the st. lines $x^2 + 4xy + y^2 = 0$ is
(a) 30° (b) 45° (c) 60° (d) None of these
- Area of parallelogram formed by the lines $y = mx$, $y = mx + 1$, $y = nx$ and $y = nx + 1$ equals.
(a) $\frac{|m+1|}{(m-n)^2}$ (b) $\frac{2}{|m+n|}$
(c) $\frac{1}{|m+n|}$ (d) $\frac{1}{|m-n|}$
- The centre of the ellipse $\frac{(x+y-2)^2}{9} + \frac{(x-y)^2}{16} = 1$ is
(a) (0, 0) (b) (1, 1) (c) (1, 0) (d) (0, 1)
- If $A = \sin^2\theta + \cos^4\theta$, then for all real values of θ
(a) $1 \leq A \leq 2$ (b) $\frac{3}{4} \leq A \leq 1$
(c) $\frac{13}{16} \leq A \leq 1$ (d) $\frac{3}{4} \leq A \leq \frac{13}{16}$
- If $A = \tan^{-1}\left(\frac{x\sqrt{3}}{2K-x}\right)$ and $B = \tan^{-1}\left(\frac{2x-K}{K\sqrt{3}}\right)$, then the value of $A - B$ is
(a) 0° (b) 45° (c) 60° (d) 30°
- The solution of $\sin^{-1}\left(\frac{2a}{1+a^2}\right) - \cos^{-1}\left(\frac{1-b^2}{1+b^2}\right) = \tan^{-1}\left(\frac{2x}{1-x^2}\right)$ is :
(a) $\frac{a-b}{1-ab}$ (b) $\frac{1+ab}{a-b}$ (c) $\frac{ab-1}{a+b}$ (d) $\frac{a-b}{1+ab}$
- If p, q are the roots of the equation $x^2 + px + q = 0$, then
(a) $p = 1, q = -2$ (b) $p = 0, q = 1$
(c) $p = -2, q = 0$ (d) $p = -2, q = 1$
- The sum of the series $0.4 + 0.004 + 0.00004 + \dots \infty$ is
(a) $\frac{11}{25}$ (b) $\frac{41}{100}$ (c) $\frac{40}{99}$ (d) $\frac{2}{5}$
- Three non-zero numbers a, b and c are in A.P. Increasing a by 1 or increasing c by 2, the numbers, become in G.P., then b equals
(a) 10 (b) 12 (c) 14 (d) 16
- A polygon has 44 diagonals. The number of its sides are
(a) 10 (b) 11 (c) 12 (d) 13
- The value of $P(n,1) + \frac{P(n,2)}{2!} + \frac{P(n,3)}{3!} + \dots + \frac{P(n,n)}{n!}$ is equal to
(a) 2^n (b) $2^n - 1$ (c) 2^{n-1} (d) $2^n + 1$
- If $(1-x+x^2)^n = a_0 + a_1x + a_2x^2 + \dots + a_{2n}x^{2n}$ then $a_0 + a_2 + a_4 + \dots + a_{2n}$ is equal to
(a) $\frac{3^n + 1}{2}$ (b) $\frac{3^n - 1}{2}$ (c) $3^n - \frac{1}{2}$ (d) $3^n + \frac{1}{2}$
- The largest term in the expansion of $(3 + 2x)^{50}$ where $x = \frac{1}{5}$ is
(a) 5th (b) 51st (c) 7th (d) 8th
- Probabilities that a plant will live is $\frac{3}{4}$ and the probability that another plant lives is $\frac{1}{3}$. The probability that only one of them lives is
(a) $\frac{7}{12}$ (b) $\frac{1}{4}$ (c) $\frac{1}{6}$ (d) N.O.T
- A determinant is chosen at random from the set of all determinants of order 2 with elements 0 or 1 only. The probability that the determinant chosen is non-zero is
(a) $\frac{3}{16}$ (b) $\frac{3}{8}$ (c) $\frac{1}{4}$ (d) N.O.T
- If $f(x) = (a - x^n)^{1/n}$, then $f(f(x))$ equals :
(a) x (b) $a - x$ (c) x^n (d) $x^{1/n}$
- If $(\log_3x)(\log_x 2x)(\log_{2x} y) = \log_x x^2$, then y equals
(a) 9 (b) 18 (c) 27 (d) 81
- If $y = ae^{mx} + be^{-mx}$ satisfies which of the following differential equation
(a) $\frac{dy}{dx} + my = 0$ (b) $\frac{dy}{dx} - my = 0$
(c) $\frac{d^2y}{dx^2} - m^2y = 0$ (d) $\frac{d^2y}{dx^2} + m^2y = 0$
- Solution of the differential equation $\frac{dx}{x} + \frac{dy}{y} = 0$
(a) $\frac{1}{x} + \frac{1}{y} = C$ (b) $\log x \log y = C$
(c) $xy = C$ (d) $x + y = C$
- If $\frac{a}{b} = \frac{1}{3}, \frac{b}{c} = 2, \frac{c}{d} = \frac{1}{2}, \frac{d}{e} = 3$ and $\frac{e}{f} = \frac{1}{4}$, then what is the value of $\frac{abc}{def}$?
(a) $\frac{3}{8}$ (b) $\frac{27}{8}$ (c) $\frac{3}{4}$ (d) $\frac{27}{4}$ (e) $\frac{1}{4}$
- A child was asked to add first few natural numbers (that is $1 + 2 + 3 + \dots$) so long his patience permitted. As he stopped, he gave the sum as 575. When the teacher declared the result wrong, the child discovered he had missed one number in the sequence during addition. The number he missed was
(a) less than 10 (b) 10
(c) 15 (d) more than 15
- A man earns $x\%$ on the first 2000 rupees and $y\%$ on the rest of his income. If he earns Rs 700 from Rs 4000 and Rs 900 from Rs 5000 of income, find x .
(a) 20% (b) 15% (c) 25% (d) None of these
- A report consists of 20 sheets each of 55 lines and each such line consists of 65 characters. This report is reduced onto sheets each of 65 lines such that each line consists of 70 characters. The percentage reduction in number of sheets is closest to
(a) 20% (b) 5% (c) 30% (d) 35%
- A stockiest wants to make some profit by selling sugar. He contemplates about various methods. Which of the following would maximize his profit?
I. Sell sugar at 10% profit.
II. Use 900 g of weight instead of 1 kg.
III. Mix 10% impurities in sugar and selling sugar at cost price.
IV. increase the price by 5% and reduce weights by 5%.
(a) I or III (b) II
(c) II, III and IV (d) Profits are same
(e) None of these
- I have one rupee coins, fifty paise coins and twenty five paise coins. The number of coins are in the ratio 2 : 5 : 3 : 4. If the total amount with me is Rs. 210, find the number of one rupee coins.
(a) 90 (b) 85 (c) 100 (d) 105
- A milkman mixes 20 L of water with 80 L of milk. After selling one-fourth of this mixture, he adds water to replenish the quantity that he has sold. What is the current proportion of water to milk?
(a) 2 : 3 (b) 1 : 2 (c) 1 : 3 (d) 3 : 4
- The sides of a triangle are 5, 12 and 13 units respectively. A rectangle is constructed which is equal in area to the triangle and has a width of 10 units. Then the perimeter of the rectangle is
(a) 30 unit (b) 36 unit

- (c) 13 unit (d) cannot be determined
28. From a circular sheet of paper with a radius of 20 cm, four circles of radius 5cm each are cut out. What is the ratio of the paper left to the area of the circles?
(a) 1 : 3 (b) 4 : 1 (c) 3 : 1 (d) 4 : 3
29. An intelligence agency forms a code of two distinct digits selected from 0, 1, 2, ..., 9 such that the first digit of the code is non zero. The code, handwritten on a slip, can however potentially create confusion, when read upside down-for example, the code 91 may appear as 16. How many codes are there for which no such confusion can arise?
(a) 80 (b) 78 (c) 71 (d) 69
(e) None of these
30. A yearly payment to the servant is Rs. 90 plus one turban. The servant leaves the job after 9 months and receives Rs. 65 and a turban. Then, find the price of the turban
(a) Rs. 10 (b) Rs. 15
(c) Rs. 7.50 (d) cannot be determined

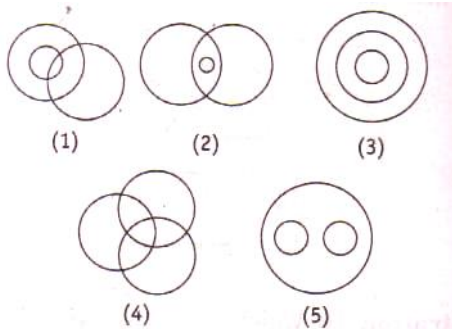
SECTION B : REASONING

Directions (Qs. Nos. 31-36): Study the following information to answer the given questions.

Ten people are sitting in two parallel rows containing five people each, in such a way that there is an equal distance between adjacent persons. In row 1, P, Q, R, S and T are seated and all of them are facing South. In row 2, A, B, C, D and E are seated and all of them are facing North. Therefore, in the given seating arrangement each member seated in a row faces another member of the other row. D sits third to the left of A. P faces immediate neighbor of D. R sits second to the right of P. Only one person sits between Q and S, B and E are immediate neighbours of each other. E does not face P and Q.

31. How many persons are seated between Q and T?
(a) None (b) One (c) Two (d) Three
32. Four of the following five are alike in a certain way and thus form a group. Which is the one that does not belong to that group?
(a) R (b) S (c) C (d) T
33. Who amongst the following represent the people sitting exactly in the middle of the rows?
(a) P, E (b) S, D (c) S, A (d) P, B
34. Which of the following is true regarding B?
(a) A and C are immediate neighbours of B
(b) B sits at one of the extreme ends of the line
(c) Q faces B
(d) D sits to the immediate left of B
35. Four of the following five are alike in a certain way and thus form a group. Which is the one that does not belong to that group?
(a) T-E (b) Q-C (c) S-B (d) R-A
36. Who amongst the following faces S?
(a) A (b) B (c) C (d) E

Directions (Qs. Nos. 37-41) : Each questions given below, has three items having certain relationship among them. The same relationship is expressed by sets of circles, each circle representing one item irrespective of its size. Match the items with right set of circles.



37. Rivers, Canals, Perennial source of water
38. Rings, Ornaments, Diamond rings
39. Women, Married persons, Wives who work
40. Computer skills, Graduates, Employed
41. Students, First divisioners, Third divisioners

Directions (Q. Nos. 42-46): Each of the questions given below consists of a question and two statements numbered I and II. You have to decide whether the data provided in the statement are sufficient to answer the questions.

Give answer

- (a) if the data in Statement I alone is sufficient to answer the questions, while the data in Statement II alone is not sufficient to answer the question
(b) If the data in Statement II alone is sufficient to answer the question, while the data in statement I alone is not sufficient to answer the question.
(c) if the data either in Statement I alone or in Statement II alone is sufficient to answer the question
(d) if the data in both statement I and II together are not sufficient to answer the question
(e) if the data in both the statements I and II together are necessary to answer the question
42. Village P is towards which direction of village R?
I. Village R is to the South-East of village T and T is to the North of Village P.
II. Village Q is to the South of village P and to the South-West of village R.
43. Who among A, B, C, D and E, each having a different height, is the third tallest?
I. E is shorter than only B.
II. C is taller than only A.
44. How many sister does K have?
I. M is sister of K.
II. K's mother has three children.
45. In a row of thirty students facing North, what is R's position from the left end?
I. There are twelve students between R and Q.
II. T is tenth from the right end and there are sixteen students between T and R.
46. How is 'go' written in code language?
I. 'go over there' is written as 'pa da na' in that code language.
II. 'go and air' is written as 'sa ka pa' in what order language.

Directions (Q. No. 47) According to certain codes

- (i) 'min fin bin gin' means 'trains are always late'.
(ii) 'gin din cin hin' means 'drivers were always punished'.
(iii) 'bin cin vin rin' means 'drivers stopped all trains'
(iv) 'din kin fin vin' means 'all passengers were late'.
47. 'Drivers were late' would be written as
(a) min cin din (b) cin din fin
(c) fin din gin (d) gin hin min

Directions (Q. Nos. 48-52): Study the following arrangement of numbers, letters and symbols carefully and answer the questions given below.

R @ 2 9 T V A Y 5 © # J 1 P 8 Q \$ E 3 * H % 6 W 4 I δ U Z

48. Four of the following five are alike in a certain way based on their positions in the above arrangement, and so form a group. Which is the one that does not belong to that group?
(a) JP© (b) E*Q (c) WI% (d) 1#δ
49. Which of the following is the fifth to the right of the nineteenth element from the right end?
(a) P (b) V
(c) W (d) None of these
50. How many such number are there in the given arrangement, each of which is immediately preceded by a consonant and immediately followed by a symbol?
(a) One (b) Two (c) Three (d) Four

51. If the positions of the last eighteen elements in the given arrangement are reserved, which of the following will be the seventeenth from the left end?
 (a) E (b) P (c) W (d) 6
52. How many such vowels are there in the given arrangement, each of which is either immediately followed by a symbol or immediately preceded by a symbol?
 (a) None of these (b) One
 (c) Two (d) three

Directions (Q. Nos. 53-54) : Read the following information carefully and answer the questions which follow.

- (i) 'P × Q' means 'Q is mother of P'
 (ii) 'P + Q' means 'P is brother of Q'
 (iii) 'P - Q' means 'P is sister of Q'
 (iv) 'P ÷ Q' means 'Q is father of P'
53. Which of the following definitely means 'R is grandson of K'?
 (a) $R \times T \div K$ (b) $M + R \times T \div K$
 (c) $M - R \times T \div K$ (d) None of these
54. Which of the following statements is redundant to answer the above question?
 (a) None (b) Only (i)
 (c) Only (ii) (d) Only (iii)
55. Starting from a point, Raju walked 12 m North, he turned right and walked 10 m, he again turned right and walked 12 m, then he turned left and walked 5 m. How far is he now and in which direction from the starting point?
 (a) 27 m towards East (b) 5 m towards East
 (c) 10 m towards West (d) 15 m towards East

Directions (Q. Nos. 56-59): The following questions are based on grammatical rules.

- Input cigarette smoking is injurious to health.
 Rule I follows smoking of rule
 Rule II cigarette when smoked
 Rule III due to
 Rule IV in any form etc.
 Solve the problems by using above rules.
- A grammar teacher instructs her students with the following inputs for restatement as per given rules.
 Input cigarette smoking is injurious to health.
 Rule I smoking of cigarette is injurious to health
 Rule II Cigarette when smoked injurious health
 Rule III health is injured due to smoking
 Rule IV smoking in any form is injurious to health.
 As per rules dictated by the teacher, find out (as a student), the relevant step or the input, as asked in the given problems.
56. Input tobacco chewing is harmful for teeth.
 Which of the following rules is chewing of tobacco is injurious for teeth?
 (a) II (b) III
 (c) I (d) IV
 (e) None of these
57. Students are benefited due to coaching, is which rule of given input?
 (a) I (b) III
 (c) II (d) Data inadequate
 (e) None of these
58. Rule IV on an input is coachings in any form are beneficial for the students, what would be rule I for the input?
 (a) taking of coachings is beneficial to the students
 (b) coaching when taken, benefit the student
 (c) students are benefited due to coachings.
 (d) data inadequate
 (e) None of the above
59. Input given by a teacher is Excessive weightlifting is harmful for joints, which of the following will be rule III of the input?
 (a) weights are harmful for joints
 (b) excessive weights, when lifted harm joints

- (c) weightlifting in any form harm joints
 (d) joints are harmed due to excessive weightlifting
 (e) data inadequate

Directions (Q. Nos. 60): In each question below are two statements followed by two conclusions numbered I and II. You have to take the two given statements to be true even, if they seem to be at variance from known facts and then decide which of the given conclusions logically commonly follows from the given statements disregarding commonly known facts.

Give answer

- (a) if only Conclusion I follows
 (b) if only Conclusion II follows
 (c) if either Conclusion I or II follow
 (d) if neither conclusion I nor II follow
 (e) if both conclusions I and II follow

60. **Statements**

Some gears are wheels.
 All wheels are brakes.

Conclusions

- I. No brake is gear.
 II. Atleast some gears are brakes.

SECTION C: COMPUTERS

61. Who is considered to be the father of computers?
 (a) John Bardeen (b) Charles Babbage
 (c) John Backus (d) William Shockley
62. What is the series of instructions that tell the hardware how to perform tasks called?
 (a) Hardware (b) Earthenware
 (c) Software (d) Ironware
63. What software allows you to view Internet sites?
 (a) A cyber cafe (b) A browser
 (c) A modem (d) Your Computer
64. "HTML" is an acronym for what?
 (a) Hypertext Markup Language
 (b) High Tone Modifier Loop
 (c) Hypertext Makeup Loop
 (d) None of the above
65. Which one of these translates a high level language to machine code?
 (a) Assembler (b) Compiler
 (c) Modem (d) None of these
66. 1 Terabyte = 1.024?
 (a) Gigabytes (b) Megabytes
 (c) Kilobyte (d) None of these
67. A 16 bit encoding for representing Characters?
 (a) Decode (b) Unicode
 (c) HTML Code (d) None of these
68. A place that a user can create to store files
 (a) cursor (b) text (c) boot (d) folder
69. A collection of information organized and up-to-date such as a telephone book, address book, or forms
 (a) encyclopedia (b) database
 (c) library books (d) crosswords
70. Nonmetallic element for making chips
 (a) hamiltonian (b) silicon
 (c) silly putty (d) nocilis
71. Sun Microsystems' Java programming language was first used in a device that
 (a) Brewed delicious coffee
 (b) Operated as a handheld remote control
 (c) Connected a toaster to the internet
 (d) Calculated spreadsheet in a palmtop
72. A "Browser" like Netscape or Internet Explorer does what?
 (a) Creates graphics
 (b) Dials up to the Internet
 (c) Accesses web pages using HTTP
 (d) Creates animated pictures
73. Which monitor resolution is NOT correct?
 (a) 1280×1024 (b) 640×480
 (c) 800×600 (d) all the above are correct

74. What is the function of a disk drive?
 (a) to print sheets of paper
 (b) to read from or write information to a floppy disk
 (c) to display information or pictures on a screen
 (d) to calculate numbers
75. The secret code that gives you access to some programs
 (a) clue (b) cue (c) help ! (d) password
76. Electronic telecommunication system joining many thousands of computers together
 (a) e-mail (b) internet
 (c) US mail (d) UPS
77. The part of the computer that does the math calculations
 (a) Arithmetic logic (b) Monitor
 (c) Numbers (d) Symbols
78. The program

```
main( )
{
    int a = 256, *p=&a;
    printf("%d", *p>>5);
}
```

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

79. What does the following function return?
 int f()
 {
 int a, b, c;
 if(a > b)
 if(a > c)
 if(c > b) return, c;
 else return b;
 else return a;
 else if(c > a)
 if(c > b) return b;
 else return c;
 else return a;
 }
 (a) minimum(a, b, c) (b) maximum(a, b, c)
 (c) middle(a, b, c) (d) gcd(a, b, c)

80. The output of the following program is
 main()
 {
 int i = 5, j = 6;
 printf("i=%d, j=%d\n", i++, ++j);
 }
 (a) i = 5, j = 6 (b) i = 5, j = 7
 (c) i = 6, j = 7 (d) i = 6, j = 6

SECTION D : ENGLISH

SET 1

We develop the vital bond of attachment (between a mother and her child through smiling response. As a visual stimulus the smile has attained its unique configuration principally by the simple act of turning up the corners of the mouth. The mouth is opened to some extent and the lips pulled back, as in the expression of fear, but with the curling up of the corners, the character of the expression is radically changed. This development has in turn led to the possibility of another and contrasting facial posture—that of the down-turned mouth. By adopting a mouth line that is the complete opposite of the smile it is possible to signal an anti-smile. Just as laughing evolved out of crying and smiling out of laughing, so also the unfriendly face has evolved, by a pendulum swing from the friendly face.

But there is more to smiling than a line of the mouth. As adults, we may be able to convey our mood by a mere twist of the lips, but the infant throws much more into the battle. When smiling at full intensity, it also kicks and waves its arms about, stretches its hands out towards the stimulus and moves them about, produces babbling

sounds, tilts back its head and protrudes its chin, leans its trunk forward or rolls it to one side and exaggerates its respiration. Its eyes become brighter and may close slightly; wrinkle appear underneath or along the eyes and sometimes also on the bridge of the nose; the fold of the skin between the sides of the nose and the side of the mouth becomes more accentuated, and the tongue may be slightly protruded. The body movements seem to indicate a struggle on the infant's part to make contact with the mother. With its clumsy physique, the baby is probably showing us all that remains of the ancestral private clinging response.

81. We recognise a smile by:
 (a) The turning up of the corners of the mouth.
 (b) Opening the mouth, stretching the lips making them longer and curling up the corners.
 (c) Stretching the lips and turning down the corners while at the same time opening the mouth a little.
 (d) Kicking and moving the arms and stretching the hands towards the opposite person.
 (e) By closing the eyes and making them brighter.

82. An adult can convey his smile by:
 (a) A mere twist of his lips.
 (b) Twisting his lips upwards.
 (c) Kicking his arms about, producing babbling noises and breathing hard.
 (d) Adopting a mouth line completely opposite the anti-smile share.

83. Which statement is 'TRUE'?
 (a) A baby's smile is more vigorous than that of an adult.
 (b) When compared to adults, a baby smiles more quietly.
 (c) It is not possible to speak when one is smiling, especially when the person is a baby.
 (d) Babies make babbling noises, tilt their heads back and protrude their chin before they can smile.

84. Smiling is an effort on the infant's part to show:
 (a) That she is happy
 (b) Her mother is happy
 (c) That it is struggling to make contact with its mother
 (d) It attempts to develop a vital bond of attachment which its ape-like ancestors tried to do by clinging to the mother

85. Match the following with words fatally opposite in meaning.
 (A) Laughing (A) Smile
 (B) Anti-smile (B) Crying
 (C) Curling up (C) Frown
 (D) Down-turned. (D) Down-turned.

SET 2

The idea of evolution (which is gradual change) was not a new one. The Greeks had thought of it, so had Erasmus Darwin, the grandfather of Charles Darwin, and also the Frenchman, Lamarck. It is one thing to have an idea; we can all guess and sometimes make a lucky guess. It is quite another thing to produce a proof of the correctness of that idea. Darwin thought he had that proof in his notebooks. He saw that all animals had to struggle to survive. Those which were best at surviving their environment passed on the good qualities which helped

them to their descendants. This was called the survival of the fittest'. For example, in a cold climate, those who have the warmest fur will live Darwin believed that this necessity for an animal to deal with its environment explained the immense variety of creatures.

86. At the time that Darwin arrived on the scene, the idea of evolution:
- Was an unheard of idea.
 - Had already been proved beyond doubt.
 - Had been thought of but not proved.
 - Was not thought fit for exploration.
87. According to Darwinian thought, the world of animals is marked by:
- Peaceful coexistence.
 - A struggle for survival.
 - Indifference towards each other.
 - Love and friendship.
88. The expression 'the survival of the fittest' means that:
- The strong will survive while the weak will perish.
 - The strong and the weak will live peacefully.
 - The strong will help the weak survive.
 - Both the strong and the weak will survive.
89. In colder climates:
- All animals can survive.
 - No animal can survive.
 - Only animals with fur can survive.
 - Animals are hard to come by.
90. Darwin thought that the environment:
- Has no effect on animals.
 - Has a lot of effect on animals.
 - Has a marginal effect on animals.
 - Has an effect on man but not on animals.
91. The sun is shining brightly, please _____ the light.
- put on
 - put off
 - put out
 - take off
92. This practice was brought _____ to prevent certain abuses.
- off
 - about
 - in
 - down
93. This package was supposed _____ yesterday.
- not to be delivered
 - to have been delivered

- to deliver
 - to be delivering
94. Her true feelings manifested themselves in her sarcastic remarks, only then was her _____ revealed.
- charm
 - sweetness
 - bitterness
 - sarcasm
95. The book provides an overview of European wines that should prove inviting to both the virtual _____ and the experienced connoisseur.
- glutton
 - prodigal
 - novice
 - zealot

Directions : In these questions, choose the word opposite in meaning to the given word:

96. Controversial
- uncertain
 - dubious
 - undisputed
 - questionable
97. Nourish
- starve
 - foster
 - sustain
 - strengthen
98. Alight
- disembark
 - embark
 - embalm
 - align

Directions : In these questions out of the four alternatives, choose the one which best expresses the meaning of the given word:

99. Pompous
- Pretentious
 - Supportive
 - Demanding
 - flashy
100. The Government
- announced the
 - policy
 - recently
 - new import
6. For films
- QRPS
 - RSPQ
 - PQRS
 - RPSQ

ANSWERS

MAHCET MOCK-1

SECTION A : MATHS / QUANT

1	2	3	4	5	6	7	8	9	10
C	D	B	B	D	D	A	C	B	B
11	12	13	14	15	16	17	18	19	20
B	A	C	A	B	A	A	C	C	A
21	22	23	24	25	26	27	28	29	30
D	B	A	B	D	A	D	C	D	A

SECTION B : REASONING

1	2	3	4	5	6	7	8	9	10
C	B	D	D	D	D	E	C	B	D
11	12	13	14	15	16	17	18	18	20
E	C	E	D	B	E	B	D	D	A
21	22	23	24	25	26	27	28	29	30
C	D	D	A	D	C	B	A	D	B

SECTION C : COMPUTERS

61	62	63	64	65	66	67	68	69	70
B	C	B	A	B	A	B	D	B	B
71	72	73	74	75	76	77	78	79	80
B	C	D	B	D	B	A	D	C	B

SECTION D: ENGLISH

81	82	83	84	85	86	87	88	89	90
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B	B	D	D	A	C	B	A	C	B
91	92	93	94	95	96	97	98	99	100
C	B	B	C	C	C	A	B	A	D

MAHCET MOCK-1

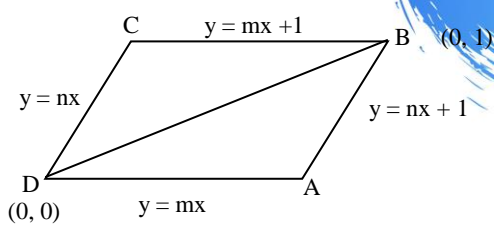
MOCK-1 SOLUTIONS

1. **Ans. (c)**
 Reqd. angle θ is given by

$$\tan \theta = \frac{2\sqrt{h^2 - ab}}{a+b} = \frac{2\sqrt{4-1}}{1+1} = \sqrt{3}$$
 $\therefore \theta = 60^\circ$ [\because Here $a = 1, b = 1, h = 2$]

2. **Ans. (d)**
 $y = mx \dots (1)$ $y = mx + 1 \dots (2)$
 $y = nx \dots (3)$ $y = nx + 1 \dots (4)$

are OA, BC, OC, AB respectively
 (1) and (3) meet at O (0, 0)
 Solving (1) and (4)
 (4) - (1) gives
 $0 = (n - m)x + 1 = 0$
 $\therefore x = \frac{1}{m - n}$ $\therefore y = \frac{m}{m - n}$
 \therefore A is $\left(\frac{1}{m - n}, \frac{m}{m - n}\right)$
 Solve (2) and (4)
 (2) - (4) gives $0 = (m - n)x \therefore x = 0$
 $\therefore y = 1 \therefore$ B is (0, 1)



Area of parallelogram = 2 Δ OAB

$$= 2 \times \frac{1}{2} \begin{vmatrix} 0 & 0 \\ 1 & m \\ 0 & 1 \\ 0 & 0 \end{vmatrix}$$

$$= \begin{vmatrix} 1 & \\ & m-n \end{vmatrix}$$

3. **Ans. (b)** Centre is given by $x + y - 2 = 0, x - y = 0$
 $\therefore 2x - 2 = 0 \Rightarrow x = 1 \therefore y = 1$
 \therefore centre is (1, 1).

4. **Ans. (b)** $= \sin^2\theta + \cos^4\theta = \sin^2\theta + \cos^2\theta(1 - \sin^2\theta)$
 $= \sin^2\theta + \cos^2\theta - \sin^2\theta \cos^2\theta$
 $= 1 - \sin^2\theta \cos^2\theta = 1 - \frac{1}{4}(\sin 2\theta)^2$
 Now $0 \leq \sin^2 2\theta \leq 1$
 $\therefore -1 \leq -\sin^2 2\theta \leq 0$
 $\Rightarrow -\frac{1}{4} \leq -\frac{1}{4}\sin^2 2\theta \leq 0$

$$\Rightarrow 1 - \frac{1}{4} \leq 1 - \frac{1}{4}\sin^2 2\theta \leq 1$$

$$\Rightarrow \frac{3}{4} \leq 1 - \frac{1}{4}(\sin 2\theta)^2 \leq 1$$

$$\Rightarrow \frac{3}{4} \leq A \leq 1$$

5. **Ans. (d)** $\tan(A - B) = \frac{\tan A - \tan B}{1 + \tan A \tan B}$

$$= \frac{\sqrt{3}x}{2K - x} - \frac{2x - K}{\sqrt{3}K}$$

$$= \frac{1 + \frac{\sqrt{3}x}{2K - x} \cdot \frac{2x - K}{\sqrt{3}K}}{3Kx - (2x - K)(2K - x)}$$

$$= \frac{3Kx - (4Kx - 2x^2 - 2K^2 + Kx)}{(2K - x)\sqrt{3}K + \sqrt{3}x(2x - K)}$$

$$= \frac{3Kx - (4Kx - 2x^2 - 2K^2 + Kx)}{2\sqrt{3}K^2 - \sqrt{3}Kx + 2\sqrt{3}x^2 - \sqrt{3}Kx}$$

$$= \frac{2x^2 - 2Kx + 2K^2}{2\sqrt{3}x^2 - 2\sqrt{3}Kx + 2\sqrt{3}K^2}$$

$$= \frac{1}{\sqrt{3}} = \tan 30^\circ$$
 $\therefore A - B = 30^\circ$

6. **Ans. (d)**
 $\sin^{-1}\left(\frac{2a}{1+a^2}\right) - \cos^{-1}\left(\frac{1-b^2}{1+b^2}\right) = \tan^{-1} \frac{2x}{1-x^2}$
 $2\tan^{-1}a - 2\tan^{-1}b = 2\tan^{-1}x$
 $\tan^{-1}a - \tan^{-1}b = \tan^{-1}x$
 $\tan^{-1}\left(\frac{a-b}{1+ab}\right) = \tan^{-1}x \Rightarrow x = \frac{a-b}{1+ab}$

7. **Ans. (a)** $p + q = -p$
 $pq = q \Rightarrow p = 1$
 $\therefore 1 + q = -1$ i.e. $q = -2$

8. **Ans. (c)** $a = 0.4, r = \frac{1}{100}$

$$S_\infty = \frac{a}{1-r} = \frac{0.4}{1 - \frac{1}{100}} = \frac{\frac{4}{10}}{\frac{99}{100}} = \frac{4}{10} \times \frac{100}{99} = \frac{40}{99}$$

9. **Ans. (b)**
 Since a, b, c are in A.P.
 $\therefore 2b = a + c$... (1)
 Again by the given condition
 a + 1, b, c are in G.P.
 and a, b, c + 2 are in G.P.

$$\begin{aligned} \therefore b^2 &= (a+1)c \quad \dots(2) \\ \text{and } b^2 &= a(c+2) \quad \dots(3) \\ \text{By (2) and (3), } (a+1)c &= a(c+2) \\ \therefore ac + c &= ac + 2a \therefore c = 2a \\ \therefore (2) \text{ gives } b^2 &= (a+1)2a \\ \text{Also (1) gives } 2b &= a + 2a = 3a \\ \therefore b &= \frac{3a}{2} \\ \therefore \frac{9a^2}{4} &= (a+1)2a \Rightarrow \frac{9a}{8} = a+1 \\ \Rightarrow \frac{a}{8} &= 1 \therefore a = 8 \\ \therefore c &= 2(8) = 16 \\ \therefore 2b &= 8 + 16 = 24 \\ \therefore b &= 12 \end{aligned}$$

10. **Ans. (b)**
Let n be the number of sides
 \therefore no. of diagonals = ${}^nC_2 - n = 44$
 $\therefore \frac{n(n-1)}{2} - n = 44 \Rightarrow n^2 - n - 2n = 88$
 $\Rightarrow n^2 - 3n - 88 = 0$
 $\Rightarrow (n-11)(n+8) = 0 \Rightarrow n = 11.$

11. **Ans. (b)**
The given value = ${}^nC_1 + {}^nC_2 + {}^nC_3 + \dots + {}^nC_n = 2^n - 1.$

12. **Ans. (a)**
Putting $x = 1, -1$ successively in the given equation and adding we shall get the result.

13. **Ans. (c)**
For $3^{50} \left(1 + \frac{2x}{3}\right)^{50}$
 $\frac{T_{r+1}}{T_r} = \frac{n-r+1}{r} \cdot \frac{2x}{3} = \frac{51-r}{r} \cdot \frac{2}{15}$
 $\left(\text{For } x = \frac{1}{5}\right) \therefore \frac{T_{r+1}}{T_r} \geq 1 \Rightarrow 102 - 2r \geq 15r$
 $\Rightarrow 102 \geq 17r$ or $r \leq 6 \therefore$ Max. value of $r = 6$ Hence 7th term is the greatest.

14. **Ans. (a)**
 $P(A) = \frac{3}{4} \therefore P(\bar{A}) = \frac{1}{4}$
 $P(B) = \frac{1}{3} \therefore P(\bar{B}) = \frac{2}{3}$
Reqd. prob. = $P(A)P(\bar{B}) + P(\bar{A})P(B)$
 $= \frac{3}{4} \cdot \frac{2}{3} + \frac{1}{4} \cdot \frac{1}{3} = \frac{7}{12}$

15. **Ans. (b)**
The determinants with +ve and -ve values are
 $\begin{vmatrix} 1 & 1 & 1 & 0 \\ 0 & 1 & 1 & 1 \\ 1 & 1 & 0 & 1 \\ 1 & 0 & 1 & 1 \end{vmatrix}; \begin{vmatrix} 1 & 0 \\ 0 & 1 \end{vmatrix}$
 $\begin{vmatrix} 1 & 1 & 0 & 1 \\ 1 & 0 & 1 & 1 \end{vmatrix}; \begin{vmatrix} 0 & 1 \\ 1 & 0 \end{vmatrix}$
Reqd. prob. = $\frac{6}{16} = \frac{3}{8}$

[\therefore total no. of determinants = $2^4 = 16$]

16. **Ans. (a)** $f(x) = (a-x^n)^{1/n} = y$
 $\therefore f(y) = (a-y^n)^{1/n} = \left[a - \left[(a-x^n)^{1/n} \right]^n \right]^{1/n}$
 $= \left[a - (a-x^n) \right]^{1/n} = (x^n)^{1/n} = x$

17. **Ans. (a)** LHS. = $\log_3 x \cdot \log_x 2x \cdot \log_{2x} y$
 $= \frac{\log x}{\log 3} \cdot \frac{\log 2x}{\log x} \cdot \frac{\log y}{\log 2x} = \frac{\log y}{\log 3} = \log_3 y$
RHS = $\log_x x^2$
 $\therefore \log_3 y = \log_x x^2 = 2 \log_x x = 2$
 $\therefore \log_3 y = 2 \therefore 3^2 = y \Rightarrow y = 9$

18. **Ans. (c)**
 $y = ae^{mx} + be^{-mx}$
 $\therefore \frac{dy}{dx} = ame^{mx} - bme^{-mx}$
 $\frac{d^2 y}{dx^2} = am^2 e^{mx} + bm^2 e^{-mx} = m^2 y$
 $\Rightarrow \frac{d^2 y}{dx^2} - m^2 y = 0$

19. **Ans. (c)** $\frac{dx}{x} + \frac{dy}{y} = 0$
 $\Rightarrow \log x + \log y = \log C$
 $\Rightarrow xy = C$

20. **Ans. (a)** Given that $\frac{a}{b} = \frac{1}{3}, \frac{b}{c} = 2, \frac{c}{d} = \frac{1}{2}, \frac{d}{e} = 3$
and $\frac{e}{f} = \frac{1}{4}$

$$\begin{aligned} \therefore \frac{a}{b} \times \frac{b}{c} \times \frac{c}{d} &= \frac{1}{3} \times 2 \times \frac{1}{2} = \frac{1}{3} \\ \Rightarrow \frac{a}{d} &= \frac{1}{3} \quad \text{and} \quad \frac{c}{d} \times \frac{d}{e} = \frac{1}{2} \times 3 = \frac{3}{2} \\ \Rightarrow \frac{c}{e} &= \frac{3}{2} \\ \text{and } \frac{e}{f} \times \frac{d}{e} \times \frac{b}{c} \times \frac{c}{d} &= \frac{1}{4} \times 3 \times 2 \times \frac{1}{2} = \frac{3}{4} \\ \Rightarrow \frac{b}{f} &= \frac{3}{4} \\ \therefore \frac{abc}{def} &= \frac{a}{d} \times \frac{c}{e} \times \frac{b}{f} = \frac{1}{3} \times \frac{3}{2} \times \frac{3}{4} = \frac{3}{8} \end{aligned}$$

21. **Ans. (d)** Sum of n natural numbers
 $= \frac{n}{2} [2a + (n-1)d]$
 $575 = \frac{n}{2} [2 + (n-1)] \Rightarrow 575 = \frac{n(n+1)}{2}$
 $n^2 + n = 1150$
for $n = 33$ $n^2 + n = 1122$
for $n = 34$ $n^2 + n = 1190.$
The difference $(1190 - 1150) = 40$

or effective change required is $\frac{40}{2} = 20$

Hence, number 20 was missed by the student.

22. **Ans. (b)** $2000 \times \frac{x}{100} + 2000 \times \frac{y}{100} = 700 \dots(i)$

and $2000 \times \frac{x}{100} + 2000 \times \frac{y}{100} = 700 \dots(ii)$

On simplifying these equations change to $x + y = 35$ and $2x + 3y = 90$. Solving these two equations simultaneously we get $x = 15\%$.

23. **Ans. (a)** Total number of characters = $20 \times 55 \times 65 = 71500$ Number of pages required, if the report is retyped
 $= \frac{71500}{65 \times 70} = 15.70$

Hence, 16 pages are required. Hence, % reduction

$= \frac{20 - 16}{20} \times 100 = 20\%$.

24. Let the CP of 1 kg of sugar be Rs. 100.

Then, CP of 900 g of sugar = $\frac{100}{1000} \times 900 = \text{Rs. } 90$

Hence, profit percent in Case II

$= \frac{100 - 90}{90} \times 100 = 11.11\%$

If he adds 10% impurity then his CP for 1 kg

$= \frac{100}{1100} \times 1000 = \text{Rs. } 90.90$

Hence, profit percent in Case III

$= \frac{100 - 90.90}{90.90} \times 100 = 10.01\%$

If he reduces weight by 5%.

Then, cost price of 950 g

$= \frac{100}{1000} \times 950 = \text{Rs. } 95$ and SP = Rs. 105

Hence, profit percent in Case IV

$= \frac{105 - 95}{95} \times 100 = 10.52\%$

Hence, method II maximizes his profit.

$\Rightarrow x = 24,00,000$

25. **Ans. (d)** Ratio of number of one rupee, fifty paise, twenty five paise coins = 2.5 : 3 : 4

\therefore Ratio of value of coins = $2.5 \times 1 : \frac{3}{2} : \frac{4}{4} = 5 : 3 : 2$

Let amount of Re1 coins, 50 paise coins and 25 paise coins be $5x$, $3x$ and $2x$ respectively.

So, $5x + 3x + 2x = 210$ (given) $\Rightarrow x = 21$

\therefore Value of one rupee coins

= number of one rupee coins = $21 \times 5 = 105$.

26. **Ans. (a)** As one-fourth of the solution (milk + water = 80

L + 20 L) is sold, solution drawn out is $100 \times \frac{1}{4} = 25$ L

Quantity of milk drawn out = $25 \times \frac{4}{5} = 20$ L

\therefore Quantity of water drawn out = 5L.

Now adding 25 L of water, quantity of water = $20 - 5 + 25 = 40$ L.

Also quantity of milk remaining = $80 - 20 = 60$ L.

\therefore Required ratio = $40 : 60 = 2 : 3$

27. By Pythagorus theorem, we find the given triangle is a right angled triangle with 12 as height and 5 as base.

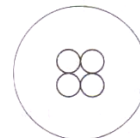
So, the area of the triangle is $\frac{1}{2} \times 12 \times 5 = 30$ sq unit.

\therefore We find the length of the rectangle with width 10 and area 30 ie, $10 \times \text{length} = 30$

\therefore Length = 3 unit

Hence, the perimeter of the rectangle is $2 \times (10 + 3) = 26$ units.

28. **Ans. (c)** Area of sheet of paper with radius 20 cm = $\pi(20)^2 = 400 \pi \text{ cm}^2$



Area of 4 circles of radius 5 cm

$= 4 \times \pi(5)^2 = 100 \pi \text{ cm}^2$

\therefore Area of remaining portion

$= 400 \pi - 100 \pi = 300 \pi \text{ cm}^2$

\therefore Required ratio = $300\pi : 100\pi = 3 : 1$

29. **Ans. (d)** The available digits are 0, 1, 2, ..., 9. The first digit can be chosen in 9 ways (0 not acceptable), the second digit can be accepted in 9 ways (digits repetition not allowed). Thus, the code can be made in $9 \times 9 = 81$ ways.

Now, there are only 4 digits which can create confusion 1, 6, 8, 9. The same can be given in the following ways.

Total number of ways confusion can arise = $4 \times 3 = 12$

Thus, required answer = $81 - 12 = 69$.

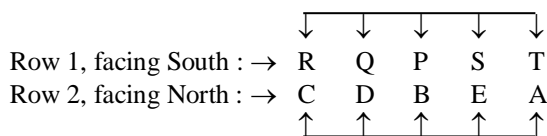
30. **Ans. (a)** Given, $\frac{(90+T)}{12} \times 9 = 65+T$

or $\frac{3}{4}(90+T) = (65+T)$

$\Rightarrow (4T - 3T) = (270 - 260)$

or $T = \text{Rs. } 10$

Solutions (Q. 31-36):



31. **Ans. (c)**

32. **Ans. (b)**

33. **Ans. (e)**

34. **Ans. (e)**

35. **Ans. (d)**

36. **Ans. (e)**

37. **Ans. (e)**

38. **Ans. (c)**

39. **Ans. (b)**

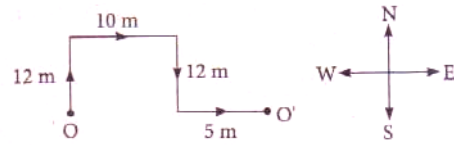
40. **Ans. (d)**

41. **Ans. (e)**

42. **Ans. (c)** The data in Statement I alone or in Statement II alone are sufficient to answer the question.
43. **Ans. (e)** The data in both the Statements I and II together are necessary to answer the question.
44. **Ans. (d)** The data given in both the Statements I and II together are not sufficient to answer the question.
45. **Ans. (b)** The data in Statement II alone are sufficient to answer the question, while the data in Statement I alone are not sufficient to answer the question.
46. **Ans. (e)** The data in both the Statements I and II together are necessary to answer the question.
47. **Ans. (b)** min fin bin gin →
 Trains are always late ... (i)
 gin din cin hin →
 drivers were always punished ... (ii)
 bin cin vin rin →
 drivers stopped all trains ... (iii)
 din kin fin vin →
 all passengers were late ... (iv)
- From Eqs. (i) and (iv), fin → late
 From Eqs. (ii) and (iii), cin → drivers
 From Eqs. (ii) and (iv), din → were
 Hence, drivers were late → cin din fin
48. **Ans. (d)**
- | | | | | |
|---|----|---|-----|---|
| J | +2 | P | -4 | © |
| E | +2 | Q | -4 | * |
| W | +2 | I | -4 | % |
| 9 | +2 | V | -4 | @ |
| 1 | -2 | # | +16 | δ |
- Hence, except option (d) all others are of the same group.
49. **Ans. (d)** Fifth to the right of the nineteenth element from the right end = Fourteenth element from the right end = Q
50. **Ans. (a)** Only one number 5, which is immediately preceded by a consonant and immediately followed by a symbol
51. **Ans. (c)** After rearrangement R@ 29 TU A YK 5, @ # 2 V
 14 w 6 % * 3 E S Q 8 P 1 J
 Seventeenth element from left = W
52. **Ans. (d)** Only three vowels E, I and U are in the arrangement immediately followed by a symbol or immediately preceded by a symbol.
53. **Ans. (d)** In each options, R × T means 'R is mother of T'. Means R is female. So, none of these represents R is grandson of K.

54. **Ans. (a)** None is redundant. Each option clarity the gender of R.

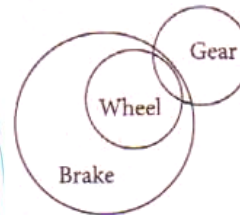
55. **Ans. (d)**



From above figure, final point O' is at a distance of 15 m from starting point O and in the East direction.

56. **Ans. (c)** Input tobacco chewing is injurious for teeth. Chewing of tobacco is injurious for teeth, so rule I follows
57. **Ans. (b)** In this due to comes so rule III follows. Students are benefited due to coachings.
58. **Ans. (a)** Rule IV coaching in any form are beneficial for the students. Rule I taking of coachings is beneficial to the students.
59. **Ans. (d)** Rule III will follow rule due to. So, joints are harmed due to excessive weightlifting is the answer.

60. **Ans. (b)**



So, only Conclusion II follows.