केंद्रीय विद्यालय संगठन क्षेत्रीय कार्यालय रायपुर

Kendriya Vidyalaya Sangathan Regional Office Raipur

Class - X

Multiple Choice Question Bank [MCQ] Term – I

MATHEMATICS [041]

Based on Latest CBSE Exam Pattern
for the Session 2021-22

केंद्रीय विद्यालय संगठन क्षेत्रीय कार्यालय रायपुर

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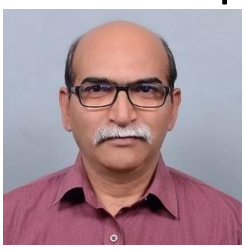

MESSAGE FROM DUPUTY COMMISSIONER

It is a matter of great pleasure for me to publish study material for different subjects of classes X and XII for Raipur Region. Getting acquainted and familiarized with the recent changes in curriculum and assessment process made by CBSE vide Circular No. 51 and 53 issued in the month of July 2021 will help students to prepare themselves better for the examination. Sound and deeper knowledge of the Units and Chapters is must for grasping the concepts, understanding the questions. Study materials help in making suitable and effective notes for quick revision just before the examination.

Due to the unprecedented circumstances of COVID-19 pandemic the students and the teachers are getting very limited opportunity to interact face to face in the classes. In such a situation the supervised and especially prepared value points will help the students to develop their understanding and analytical skills together. The students will be benefitted immensely after going through the question bank and practice papers. The study materials will build a special bond and act as connecting link between the teachers and the students as both can undertake a guided and experiential learning simultaneously. It will help the students develop the habit of exploring and analyzing the ***Creative & Critical Thinking Skills***. The new concepts introduced in the question pattern related to case study, reasoning and ascertain will empower the students to take independent decision on different situational problems. The different study materials are designed in such a manner to help the students in their self-learning pace. It emphasizes the great pedagogical dictum that *'everything can be learnt but nothing can be taught'*. The self-motivated learning as well as supervised classes will together help them achieve the new academic heights.

I would like to extend my sincere gratitude to all the principals and the teachers who have relentlessly striven for completion of the project of preparing study materials for all the subjects. Their enormous contribution in making this project successful is praiseworthy.

Happy learning and best of luck!

Vinod Kumar
(Deputy Commissioner)

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Kendriya Vidyalaya Sangathan Regional Office Raipur

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KENDRIYA VIDYALAYA SANGATHAN, RAIPUR REGION

QUESTION BANK
CLASS – X (SESSION 2021-22)

TERM –I
SUBJECT- MATHEMATICS

INDEX

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TOPIC: REAL NUMBERS (CLASS X)

MCQ

Q (1) The HCF of 96 and 404 is …….

(a) 1
(b) 2
(c) 3
(d) 4

Q (2) Which of the following is not an irrational number?

(a) $7\sqrt{5}$
(b) $\sqrt{2}+2\sqrt{2}$
(c) $(\sqrt{7}-3) - \sqrt{7}$
(d) $\sqrt{3}+2$

Q (3) Which of the following has a terminating decimal expansion?

(a) $\frac{23}{200}$
(b) $\frac{17}{9}$
(c) $\frac{8}{75}$
(d) $\frac{3}{35}$

Q (4) Which of the following has a non terminating repeating decimal expansion?

(a) $\frac{3}{8}$
(b) $\frac{13}{125}$
(c) $\frac{7}{80}$
(d) $\frac{29}{343}$

Q(5) HCF (306, 657) = 9, what will be the LCM (306, 657) ?

(a) 12338

(b) 22338
(c) 23388
(d) 22388

Q (6) Three bulbs red, green and yellow flash at internals of 80 seconds, 90 seconds and 110 seconds. All three flash together at 8:00 am. At what time the three bulbs flash altogether again?

(a) 10:20 am

(b) 10:10 am
(c) 10:12 am
(d) 10:23 am

Q (7) Three bells toll at intervals of 9, 12, 15 minutes respectively. If they start tolling together. After how many hours will they next toll together?

(a) 2 hours

(b) 1 hour
(c) 4 hours
(d) 3 hours

Q (8) What is HCF of two consecutive natural numbers?

(a) 1

(b) 2
(c) 3
(d) 4

Q (9) After how many places, the decimal expansion of the rational number $\frac{43}{2^4 \times 5^3}$ will terminate.

(a) 1
(b) 2
(c) 3
(d) 4

Q (10) Find the least number which is divisible by the natural numbers from 1 to 10.

(a) 2250
(b) 2550
(c) 2520
(d) 2025

Q (11). Assertion: There are two numbers such that there HCF is 18 and LCM is 380.
Reason: The LCM must be divisible by HCF.

A. Both Assertion and Reason are correct and Reason is the correct explanation for Assertion.
B. Both Assertion and Reason are correct but Reason is not the correct explanation for Assertion.
C. Assertion is correct but Reason is incorrect.
D. Assertion is incorrect but Reason is correct.

Q (12). Assertion: The number $\frac{13}{3125}$ have terminating decimal expansion.
Reason: It is in the form of $\frac{p}{2^m \times 5^n}$ where m and n are positive integers.

A. Both Assertion and Reason are correct and Reason is the correct explanation for Assertion.
B. Both Assertion and Reason are correct but Reason is not the correct explanation for Assertion.
C. Assertion is correct but Reason is incorrect.
D. Assertion is incorrect but Reason is correct.

Q (13) Assertion: The number 4^n cannot end with the digit zero, where n is a natural number.

Reason: The prime factorization of number 4^n have only the prime 2.

A. Both Assertion and Reason are correct and Reason is the correct explanation for Assertion.
B. Both Assertion and Reason are correct and Reason is not the correct explanation for Assertion.
C. Assertion is correct but Reason is incorrect.
D. Assertion is incorrect but Reason is correct.

Q(14) Assertion: The HCF of two numbers is 5 and their product is 150, then there LCM is 30
Reason: For any two positive integers a and b , HCF (a,b) + LCM (a,b) = a × b.

A. Both Assertion and Reason are correct and Reason is the correct explanation for Assertion.
B. Both Assertion and Reason are correct and Reason is not the correct explanation for Assertion.
C. Assertion is correct but Reason is incorrect.
D. Assertion is incorrect but Reason is correct.

Q(15) Assertion: $5 - \sqrt{3}$ is an irrational number.
Reason : Every Irrational number has a non terminating non recurring decimal expansion.

A. Both Assertion and Reason are correct and Reason is the correct explanation for Assertion.
B. Both Assertion and Reason are correct and Reason is not the correct explanation for Assertion.
C. Assertion is correct but Reason is incorrect.
D. Assertion is incorrect but Reason is correct.

CASE STUDY

Case Study 1: There is a circular path around a sports field. Sonia takes 9 min to drive one round, while Ravi takes 12 min for the same. Suppose they both start at the same point and at the same time, and go in the same direction.

Q (16) After how many minutes will they meet again ?

(a) 36 min
(b) 12 min
(c) 2 min
(d) 5 min

Q (17) What will you find for getting the answer ?

(a) HCF
(b) LCM
(c) Prime factorization
(d) Square root

Q (18) If Ravi will take 20 minutes and Sonia takes same 9 min to complete one round, then after how many minutes they will meet again ?

(a) 180 min
(b) 100 min
(c) 120 min
(d) 90 min

Case study 2: A sweetseller has 420 kaju barfis and 130 badam barfis. She wants to stack them in such a way that each stack has the same number, and they take up the least area of the tray.

Q (19) What is the number of each barfi that can be placed in each stake?

(a) 40 barfis of each kind
(b) 30 barfis of each kind
(c) 20 barfis of each kind
(d) 10 barfis of each kind

Q (20) How many trays are required to keep all the barfi?

(a) 35
(b) 45
(c) 55
(d) 65

ANSWERS

MCQ

1. (d) 4 2. (c) (√7-3) - √7 3. (a) $\frac{23}{200}$ 4. (d) $\frac{29}{343}$ 5. (b) 22338
6. (c) 10:12 am 7. (d) 3 hours 8. (a) 1 9. (d) 4 10. (c) 2520

ASSERTION AND REASONING

11. Correct answer (D)

Justification**:** If LCM and HCF of two numbers are given then the LCM must be divisible by HCF. 380 is not divisible by 18 so that assertion is wrong.

12. Correct answer (A)

Justification: The prime factorization of the denominator must be in the form of $2^m \times 5^n$, then only the Rational numbers have terminating decimal expansion. $3125 = 5 \times 5 \times 5 \times 5 \times 5$

13. Correct answer (A)

Justification: If the number 4^n; for any n, were to end with the zero, then it would be divisible by 2 and 5 both. This is not possible because $4^n = (2)^{2n}$; so the only the prime in the prime factorization of 4^n is 2. The uniqueness of Fundamental Theorem of Arithmetic guarantees that there are no other primes in the factorization of 4^n. So there is no natural number n for which 4^n ends with the digit zero

14. Correct answer (C)

Justification: For any two positive integers a and b , HCF (a,b) × LCM (a,b) = a × b.
$30 \times 5 = 150$, so the assertion is correct but the reason is not correct.
15.

Correct answer (B)

Justification Both the assertion and the reason are correct but they are not related to each other.

CASE STUDY

16. (a) 36 min 17. (b) LCM 18. (a) 180 min 19. (d) 10 barfis of each kind 20. (c) 55

TOPIC: (POLYNOMIAL)
MCQ

1. The zeroes of the quadratic polynomial $x^2 + 7x + 10$ are

   (a) $-4, -3$ (b) $2, 5$ (c) $-2, -5$ (d) $-2, 5$

2. The zeroes of the quadratic polynomial $x^2 - 27$ are

(a) $+3\sqrt{3}, -3\sqrt{3}$ (b) 3 , 3 (c) 9 ,9 (d) $+\sqrt{3}, -\sqrt{3}$

3. A quadratic polynomial can have at most _____ zeroes.

(a) 0 (b) 1 (c) 2 (d) infinite

4. A quadratic polynomial, whose zeroes are -2 and 4, is
(a) $x^2 - 2x + 8$ (b) $x^2 + 2x + 8$ (c) $x^2 - 2x - 8$ (d) $2x^2 + 2x - 24$

5. The number of polynomials having zeroes as -2 and 5 is
(a) 1 (b) 2 (c) 3 (d) more than 3

6. The sum and the product of the zeroes of polynomial $6x^2 - 5$ respectively are
(a) 0, $\frac{-6}{5}$ (b) 0, $\frac{6}{5}$ (c) 0, $\frac{5}{6}$ (d) 0, $\frac{-5}{6}$

7. The zeroes of the quadratic polynomial $x^2 + kx + k$ where $k \neq 0$,
(a) cannot both be positive (b) cannot both be negative
(c) are always unequal (d) are always equal

8. If the zeroes of the quadratic polynomial $ax^2 + bx + c$, where $c \neq 0$, are equal, then
(a) c and a have opposite signs (b) c and b have opposite signs
(c) c and a have same signs (d) c and b have the same signs

9. If one of the zeroes of a quadratic polynomial of the form $x^2 + ax + b$ is the negative of the other, then it
(a) has no linear term and the constant term is negative
(b) has no linear term and the constant term is positive
(c) can have a linear term but the constant term is negative
(d) can have a linear term but the constant term is positive

10. If one zero of the quadratic polynomial $x^2 + 3x + k$ is 2, then the value of k is
(a) 10 (b) -10 (c) 5 (d) -5

11. If one zero of the quadratic polynomial $x^2 - 4x + 1$ is $2 + \sqrt{3}$, then the other zero is

(a) $-2 + \sqrt{3}$ (b) $-\sqrt{3} - 2$ (c) $2 - \sqrt{3}$ (d) $\sqrt{3} + 1$

12. If 2 is a zero of the polynomial $p(x) = kx^2 + 3x + k$, then the value of k is
(a) $\frac{5}{6}$ (b) $\frac{-5}{6}$ (c) $\frac{6}{5}$ (d) $\frac{-6}{5}$

13. If one of the zeroes of the quadratic polynomial $(k - 1)x^2 + kx + 1$ is – 3, then the value of k is
(a) $\frac{4}{3}$ (b) $\frac{-4}{3}$ (c) $\frac{2}{3}$ (d) $\frac{-2}{3}$

14. **If the sum of the zeroes of the quadratic polynomial k**$x^2 + 2x + 3k$ is equal to **their product, then k is equal to**

(a) $\frac{1}{3}$ (b) $\frac{-2}{3}$ (c) $\frac{-1}{3}$ (d) $\frac{2}{3}$

15. If zeroes of $p(x) = 2x^2 - 7x + k$ reciprocal of each other

(a) 1 (b) 2 (c) 3 (d) -7

16. If the zeroes of a quadratic polynomial $p(x) = ax^2 + x + a$ are equal, then the value of a is

(a) $\frac{1}{2}$ (b) $\frac{-1}{2}$ (c) $\pm\frac{1}{2}$ (d) ± 1

17. A quadratic polynomial whose one zero is 6 and sum of the zeroes is 0, is
(a) $x^2 - 6x + 2$ (b) $x^2 - 36$ (c) $x^2 - 6$ (d) $x^2 - 3$

18. If α, β are the zeroes of the polynomial $x^2 - 16$, then αβ (α + β) is
(a) 0 (b) 4 (c) -4 (d) 16

19. If 2 and 3 are zeroes of polynomial $3x^2 - 2kx + 2m$, then the value of k and m are, respectively
(a) $\frac{9}{2}$, 15 (b) $\frac{15}{2}$, 9 (c) 9, $\frac{15}{2}$ (d) 15, 9

20. If zeroes α and β of a polynomial $x^2 - 7x + k$ are such that $\alpha - \beta = 1$, then the value of k is
(a) 21 (b) 12 (c) 9 (d) 8

21. A quadratic polynomial whose one zero is 5 and product of the zeroes is 0, is
(a) $x^2 - 5$ (b) $x^2 - 5x$ (c) $5x^2 + 1$ (d) $x^2 + 5x$

22. 1 and 2 are zeroes of the polynomial $x^2 - 3x + 2$.
(a) True (b) False (c) Can't say (d) Partially true/false

23. If α and β are the zeroes of the polynomial $4s^2 - 4s + 1$, then match the value of column I with that of Column II.

Column I	Column II
A. $\frac{1}{\propto} + \frac{1}{\beta}$	1. 4
B. $\propto + \beta$	2. 1
C. $\propto \beta$	3. $\frac{1}{4}$
D. $\frac{\propto}{\beta} + \frac{\beta}{\alpha}$	4. $\frac{1}{2}$

(a)A-1, B-2, C-3, D- 4
(b) A-1 , B-4, C-2, D- 3
(c) A-4 , B-1, C-2, D- 3
(d) A-4 , B-2, C-1, D- 3

24. If α and $\frac{1}{\propto}$ are the zeroes of the polynomial $ax^2 + bx + c$, then value of c is
(a) 0 (b) a (c) $-a$ (d) 1

25. The sum and product of zeroes of a quadratic polynomial are respectively $\frac{1}{4}$ and – 1 . Then the corresponding quadratic polynomial is
(a)$4x^2 + x - 4$ (b) $x^2 - 4x - 4$ (c) $4x^2 - 4x - 1$ (d) $4x^2 - x - 4$

ASSERTION REASONING QUESTIONS

DIRECTION: In the following questions (Q1-10), a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:

(a) if both assertion (A) and reason (R) are true and reason (R) is the correct explanationof assertion (A).

(b)if both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

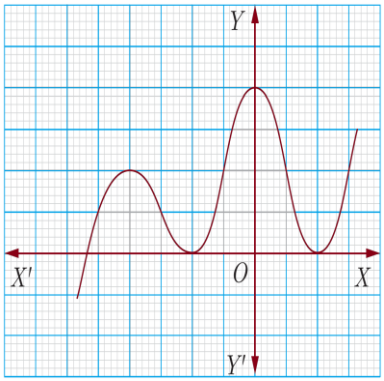
(c)if Assertion (A) is true but reason (R) is false.

(d)if Assertion (A) is false but reason (R) is true.

1. **Assertion:** $x^2 + 4x + 5$ has two real zeroes.
   Reason: A quadratic polynomial can have at the most two zeroes.

2. **Assertion:** $y^3 + 3y$ has only one real zero.
   Reason: A polynomial of nth degree must have n real zeroes.

3. **Assertion:** The graph $y = f(x)$ is shown infigure, for the polynomial $f(x)$. The numberof zeros of $f(x)$ is 3.
   Reason: The number of zero of thepolynomial $f(x)$ is the number of points of which $f(x)$ cuts or touches the axes.



4. **Assertion:** Degree of a zero polynomial is not defined.
   Reason: Degree of a non-zero constant polynomial is '0'.

5. **Assertion:** $x^2 + 11x + 30$ has no real zeroes.
   Reason: A quadratic polynomial can have at the most two zeroes.

6. **Assertion:** If the sum of the zeroes of the quadratic polynomial $x^2 - 2kx + 8$ is 2, then value of k is 1.
   Reason: Sum of zeroes of a quadratic polynomial $ax^2 + bx + c$ is $\frac{-b}{a}$.

7. **Assertion:** A quadratic polynomial, sum of whose zeroes is 6 and their productis 8 is $x^2 - 14x + 48$. **Reason:** If α and β be the zeroes of the polynomial f(x), then polynomial is givenby $f(x) = x^2 - (\alpha + \beta)x + \alpha\beta$.

8. **Assertion:** $P(x) = 3x^3 - 2x^2 + 4x^4 + x - 2$ is a polynomial of degree 3.
Reason: The highest power of x in the polynomial $P(x)$ is the degree of the polynomial.

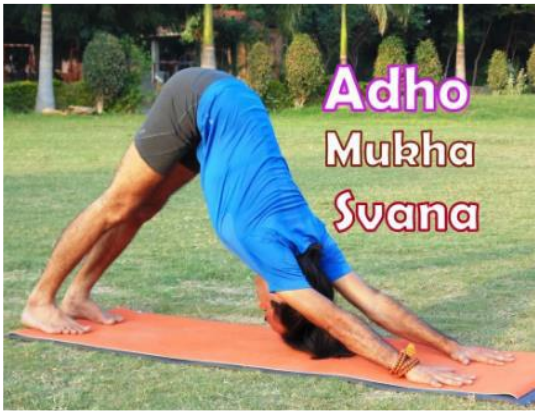
9. **Assertion:** If the sum and product of zeroes of a quadratic polynomial are 3 and -2 respectively, then quadratic polynomial is $x^2 - 3x - 2$.
Reason: If S is the sum of the zeroes and P is the product of the zeroes of a quadratic polynomial, then the corresponding quadratic polynomial is $x^2 - +P$.

10. **Assertion:** If $\propto$ and β are the zeroes of the polynomial $x^2 + 2x - 15$, then $\frac{1}{\propto} + \frac{1}{\beta}$ is $\frac{2}{15}$.

Reason: If $\propto$ and β are the zeroes of a quadratic polynomial $ax^2 + bx + c$, then $\propto + \beta$ is $\frac{-b}{a}$ and $\propto \beta = \frac{c}{a}$.

Case Study Based Questions

1. An asana is a body posture, originally and still a general term for a sitting meditation pose, and later extended in hatha yoga and modern yoga as exercise, to any type of pose or position, adding reclining, standing, inverted, twisting, and balancing poses. In the figure, one can observe that poses can be related to representation of quadratic polynomial. (from CBSE)



(i) The shape of the poses shown is

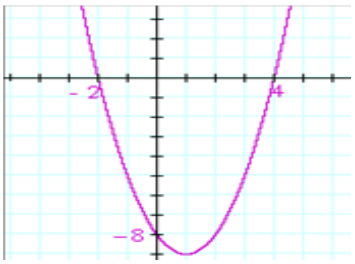
(a) Spiral (b) Ellipse (c) Linear (d) Parabola

(ii) The graph of parabola opens downwards, if _____

(a) a ≥0 (b) a = 0 (c) a < 0 (d) a > 0

(iii) In the graph, how many zeroes are there for the polynomial?

(a) 0 (b) 1 (c) 2 (d) 3



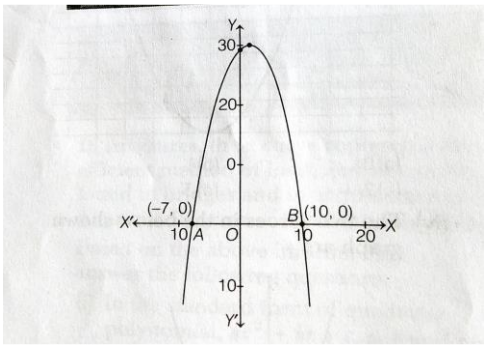
(iv) The two zeroes in the above shown graph are

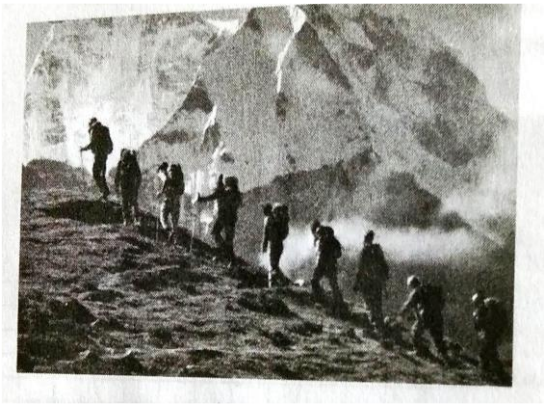
(a) 2, 4 (b) −2, 4 (c) −8, 4 (d) 2,−8

(v) The zeroes of the quadratic polynomial $4\sqrt{3}\,x^2 + 5x - 2\sqrt{3}$ are

(a) $\frac{2}{\sqrt{3}}, \frac{\sqrt{3}}{4}$ (b) $\frac{-2}{\sqrt{3}}, \frac{\sqrt{3}}{4}$ (c) $\frac{2}{\sqrt{3}}, \frac{-\sqrt{3}}{4}$ (d) $\frac{-2}{\sqrt{3}}, -\frac{\sqrt{3}}{4}$

2. Two friends Aryan and Om decided to go for a trekking. During summer vacation, they went to Panchmarhi. While trekking they observed that the trekking path is in the shape of a parabola. The mathematical representation of the track is shown in the graph.





Based on the above information, answer the following questions.

(i) The zeroes of the polynomial whose graph is given are
(a)4,7 (b) −4, 7 (c) 4, 3 (d) −7, 10

(ii) What will be the expression of the given polynomial p(x)?
(a) $x^2 - 3x - 70$ (b) $-x^2 + 4x - 28$ (c) $x^2 + 4x - 28$ (d) $-x^2 + 3x + 28$

(iii) Product of the zeroes of the polynomial which represents the parabola is
(a)−28 (b) −70 (c) 28 (d) 30

(iv) In the standard form of quadratic polynomial, $ax^2 + bx + c$, a, b, and c are
(a)All are real numbers
(b) All are rational numbers
(c) a is a no zero real number, b and c are any real numbers
(d)All are integers

(v) If the sum of the roots is -p and product of the roots is $-\frac{1}{p}$, then the quadratic polynomial is

(a) $-px^2 + \frac{x}{p} + 1$ (b) $)px^2 - \frac{x}{p} - 1$ (c) $x^2 + px - \frac{1}{p}$ (d) $x^2 - px + \frac{1}{p}$

Answer key (MCQs)

1. c	2. a	3. c	4. c	5. d	6. d	7. a	8. c	9. a	10. b
11. c	12. d	13. a	14. b	15. b	16. d	17. b	18. a	19. c	20. b
21. b	22. a	23. a	24. b	25. d					

Answer key (Assertion Reasoning Questions)

1. d	2. c	3. c	4. b	5. d	6. a	7. d	8. d	9. a	10. a

Explanation of Assertion Reasoning Questions

1. $p(x) = 0 \Rightarrow x^2 + 4x + 5 = 0$ Discriminant, $D = b^2 - 4ac = 16 - 20 = -4 < 0$

   Therefore, no real zeroes are there.

   Assertion (A) is false but reason (R) is true. Correct option is (d)

2. $y^3 + y = y(y^2 + 1)$ which has only one real zero i.e. $y = 0$. So assertion is true.
   Reason is false (a polynomial of nth degree has at most *n* zeroes)
   Correct option is (c) Assertion (A) is true but reason (R) is false.

3. As the number of zeroes of a polynomial *f(x)* is the number of points at which *f(x)* cuts (intersects) the *x* –axis and number of zero in the given figure is 3. So A is correct but R is not correct.
   Correct Option (c) Assertion (A) is true but reason (R) is false.

4. The constant polynomial 0 is called a zero polynomial.The degree of a zero polynomial is not defined.
   So, Assertion is true.
   The degree of a non-zero constant polynomial is zero.So, Reason is true.
   Since both Assertion and Reason are true and Reason is not a correct explanationof Assertion.
   Correct option is (b)

5. $x^2 + 11x + 30 = x^2 + 6x + 5x + 30 = x(x + 6) + 5(x + 6) = (x + 6)(x + 5)$
   $\Rightarrow (x + 6) = 0$ or $(x + 5) = 0 \Rightarrow x = -6$ or $x = -5$
   Therefore, $x^2 + 11x + 30$ has two real zeroes.
   Correction option is (d) Assertion (A) is false but reason (R) is true.

6. Sum of zeroes $= \frac{-b}{a} = \frac{-(-2k)}{1} = 2k$, So $2k = 2$ or $k = 1$
   So, Assertion is true.
   Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
   Correct option is (a)

7. Reason is correct. If α and β be the zeroes of the required polynomial f(x),then $(\alpha + \beta) = 6$ and $\alpha\beta = 8$
   $\therefore f(x) = x^2 - (\alpha + \beta)x + \alpha\beta$
   $\Rightarrow f(x) = x^2 - 6x + 8$
   So, Assertion is not correct

Correction option is (d)

8. The highest power of x in the polynomial $P(x) = 3x^3 - 2x^2 + 4x^4 + x - 2$ is 4.
Therefore, the degree of the polynomial P(x) is 4.
Correct option is (d) Assertion (A) is false but reason (R) is true

9. Let $\propto$ and β are the zeroes of a quadratic polynomial $ax^2 + bx + c$. Then $\propto + \beta$ = S and $\propto \beta$ = P.
So, the polynomial is $x^2 - (\alpha + \beta)x + \alpha\beta = x^2 - Sx + P = x^2 - 3x - 2$.
Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
Correct option is (a)

10. Let p(x) = $x^2 + 2x - 15$ $\propto + \beta = -2$ and $\propto \beta = -15$
$\frac{1}{\propto} + \frac{1}{\beta} = \frac{\beta + \alpha}{\alpha\beta} = \frac{-2}{-15} = \frac{2}{15}$. So assertion is true , reason is true and reason is a correct explanation of assertion.
Correct option is (a)

Answer key (Case Study Based Questions)

1(i). d 1(ii). c 1(iii). b 1(iv). b 1(v). b 2(i). d 2(ii). a 2(iii). b 2(iv). c 2(v). c

TOPIC: LINEAR EQUATION IN TWO VARIABLES

Q1. If x = a, y = b is the solution of the equations x + y = 5 and 2x – 3y = 4, then the values of a and b are respectively
(a) 6, -1
(b) 2, 3
(c) 1, 4
(d) 19/5, 6/5

Q2. The father's age is six times his son's age. Four years hence, the age of the father will be four times his son's age. The present ages, in years, of the son and the father are, respectively
(A) 4 and 24
(B) 5 and 30
(C) 6 and 36
(D) 3 and 24

Q3. The value of k, for which the system of equations x + (k + l)y = 5 and (k + l)x + 9y = 8k – 1 has infinitely many solutions is
(a) 2
(b) 3
(c) 4
(d) 5

Q4. If in the equation x + 2y = 10, the value of y is 6, then the value of x will be
(a) -2
(b) 2

(c) 4
(d) 5

Q5. If a pair of linear equations is consistent, then the lines will be
(a) always coincident
(b) parallel
(c) always intersecting
(d) intersecting or coincident

Q6. There are cow and hen in the field. By counting heads, they are 52, the number of their legs is 176 how many hens are there.
(a) 12
(b) 16
(c) 20
(d) 36

Q7. There are cow and hen in the field . By counting heads they are 52 , the number of their legs is 176 how many cows are there.
(a) 30
(b) 36
(c) 16
(d)14

Q8 . The value of c for which the pair of equations $cx – y = 2$ and $6x – 2y = 3$ will have infinitely many solutions is
(a) 3
(b) -3
(c) -12
(d) no value

Q9. A pair of linear equations which has a unique solution $x = 2, y = -3$ is

(a) $x + y = -1$
$2x – 3y = -5$

(b) $2x + 5y = -11$
$4x + 10y = -22$

(c) $2x – y = 1$
$3x + 2y = 0$

(d) $x – 4y – 14 = 0$
$5x – y – 13 = 0$

Q10. Aruna has only Rs 1 and Rs 2 coins with her. If the total number of coins that she has is 50 and the amount of money with her is Rs 75, then the number of Rs 1 and Rs 2 coins are respectively
(a) 35 and 15
(b) 35 and 20
(c) 15 and 35
(d) 25 and 25

Q11. Graphically, the pair of equations $6x - 3y + 10 = 0$
$2x - y + 9 = 0$
represents two lines which are
(a) Intersecting at exactly one point
(b) Intersecting at two points
(c) Coincident
(d) Parallel

Q12. The sum of the digits of a two-digit number is 9. If 27 is added to it, the digits of the number get reversed. The number is
(a) 27
(b) 72
(c) 45
(d) 36

Q13. The pair of equations $x = 0$ and $x = 5$ has
(a) no solution
(b) unique/one solution
(c) two solutions
(d) infinitely many solutions

Q14. **Assertion:**The linear equations $x-2y-3=0$ and $3x+4y-20=0$ have exactly one solution.
Reason: The linear equations $2x+3y-9=0$ and $4x+6y-18=0$ have a unique solution.

A. Both Assertion and Reason are correct and Reason is the correct explanation for Assertion.
B. Both Assertion and Reason are correct but Reason is not the correct explanation for Assertion.
C. Assertion is correct but Reason is incorrect.
D. Assertion is incorrect but Reason is correct.

Q15. **Assertion**: Homogeneous system of linear equations is always consistent.
Reason: $x=\mathbf{0},y=\mathbf{0}x=0,y=0$ is always a solution of the homogeneous system of equations with unknowns x and y , then which of the following statements is true?

A. Both Assertion and Reason are correct and Reason is the correct explanation for Assertion.
B. Both Assertion and Reason are correct and Reason is not the correct explanation for Assertion.
C. Assertion is correct but Reason is incorrect.
D. Assertion is incorrect but Reason is correct.

Q16. A test consists of 'True' or 'False' questions. One mark is awarded for every correct answer while ¼ mark is deducted for every wrong answer. A student knew answers to some of the questions. Rest of the questions he attempted by guessing. He answered 120 questions and got 90 marks.

Type of Question	Marks given for correct answer	Marks deducted for wrong answer
True/False	1	0.25

If answer to all questions he attempted by guessing were wrong, then how many questions did he answer correctly?

(A) 96
(B) 100
(C) 98
(D) 88

Q17. From question 16, How many questions did he guess?

(A) 25
(B) 24
(C) 27
(D) 20

Q18. From question 16, If answer to all questions he attempted by guessing were wrong and answered 80 correctly, then how many marks he got?

(a) 75
(b) 73
(c) 70
(d) 69

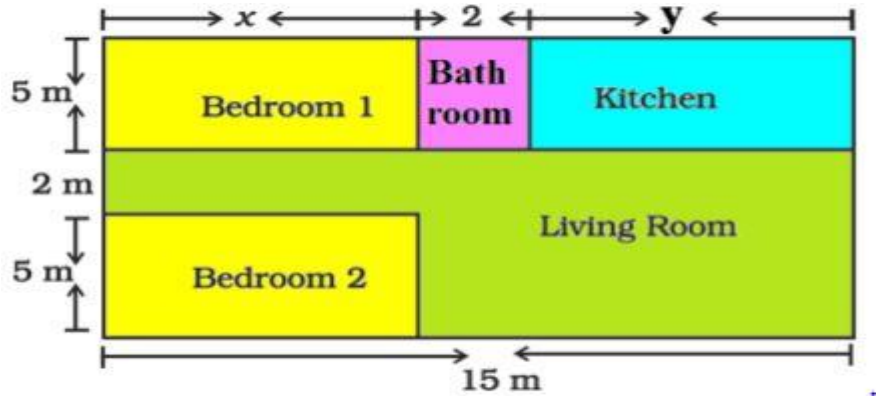
Q19 . From question 16, If answer to all questions he attempted by guessing were wrong, then how many questions answered correctly to score 95 marks?

(a) 93
(b) 92
(c)100
(d) 95

Q20. From Q 16, If Ram attempt 100 que out of them 80 are correct 20 are incorrect How much marks scored by ram.

(A) 80
(B) 75
(C) 70
(D) none

Q21. Amit is planning to buy a house and the layout is given below. The design and the measurement has been made such that areas of two bedrooms and kitchen together is 95 sq.m.



Based on the above information, answer the following questions:

The pair of linear equations in two variables from this situation. Which one is correct.

(A) 2x + y = 13
(B) X + y =13
(C) X-y = 13
(D) Can not be formed

Q22. From Q 21, Find the length of the outer boundary of the layout.

(A) 54
(B) 44
(C) 64
(D) NONE

Q23. From Q21, the area of bedroom and kitchen respectively in the layout is

(a) 30 , 35
(b) 35 ,30
(c) 30,30
(d) none

Q24. From Q21, the area of living room in the layout is.

(a) 75
(b) 65
(c) 85
(d) none

Q25. From Q21, the cost of laying tiles in kitchen at the rate of Rs. 50 per sq. m.

(a) 1550
(b) 1654
(c) 1750
(d) none

ANSWER KEY MCQ OF LINEAR EQUATION IN TWO VARIABLES

Correct answer Q1 (d) 19/5 , 6/5
Correct answer Q2 (c) 6 and 36

Correct answer Q 3 (a) 2

Correct answer Q4 (a) -2

Correct answer Q5 (d) intersecting or coincident

Correct answer Q6 b) 16

Correct answer Q7 (b) 36
Correct answer Q8 (d) no value
Correct answer Q9 (d)
Correct answer Q10 (d)

Correct answer Q11 (d)
Correct answer Q12 (d)
Correct answer Q13 (c)
Correct answer Q14 (c)

Justification : A system of linear equations can have any of the three possible types of solutions: Unique Solution, Infinitely many Solutions and No Solution. If the lines are intersecting at one point, then the linear equations have a unique solution. If the lines are coincident, then the system has infinitely many solutions. And, if the lines are parallel, then the system does not have any solution.

Complete step-by-step answer:
Let us first consider the assertion. It says that the linear equations $x-2y-3=0$ and $3x+4y-20=0$ have exactly one solution.
Let $x-2y-3=0$ --- (1)
And, $3x+4y-20=0$ ---(2)
In order to solve these equations, let us multiply the first equation by 3.
$3(x-2y-3)=3\times0$
$\Rightarrow 3x-6y-9=0$----(3)
Subtracting equation 3 from equation 2, we get,
$3x+4y-20-(3x-6y-9)=0$
Removing the brackets, we get,
$3x+4y-20-3x+6y+9=0$
$\Rightarrow 10y-11=0$
$\Rightarrow y=11/10$
Now, in order to find the value of x, substituting the value of y in equation 1, we get,
$x-2\times11/10-3=0$
$\Rightarrow x=22/10+3=22+30/10=52/10=26/5$

Thus, the pair of linear equations given possess exactly one solution (unique solution).
Hence, the assertion is correct.
Now, let us consider the reason. It says that the linear equations $2x+3y-9=0$ and $4x+6y-18=0$ have a unique solution.
Let $2x+3y-9=0$---(1)
And, $4x+6y-18=0$---(2)
In order to solve these equations, let us multiply the first equation by 2.
$2(2x+3y-9)=2\times0$
$\Rightarrow 4x+6y-18=0$---(3)
As, equation 2 and 3 are same thus, thus the two linear equations given to us are coincident possessing infinitely many solutions.
Thus, the reason is not correct.
Thus, Assertion is correct but the Reason is incorrect.
Hence, option C is correct.

Correct answer Q15 (a)

Justification : Here we will use the concept of the consistency. First, we will write the general form or general equation of the Homogeneous system of linear equations. Then we will check the equation consistency at point (0,0) . If it satisfies the equation, then we will choose the option which best resembles the answer.
Correct answer Q16 (a) 96 Correct answer Q17 (b) 24

Correct answer Q18 (c) 70

Correct answer Q19 (d) 95

Correct answer Q20 (b) 75

Correct answer Q21. (b) x + y =13

* Area of two bedrooms= 10x sq.m

Area of kitchen = 5y sq.m
10x + 5y = 95
2x + y =19
Also, x + 2+ y = 15
x + y = 13
Correct answer Q22. (a) 54
* Length of outer boundary = 12 + 15 + 12 + 15 = 54m
Correct answer Q23. (a) 30 , 35
*area of bedroom = 5 x 6 = 30m
area of kitchen = 5 x 7 = 35m
Correct answer Q24. (a) 75
*Area of living room = (15 x 7) – 30 = 105 – 30 = 75 sq. m

Correct answer Q25. (c) 1750

*Total cost of laying tiles in the kitchen = Rs50 x 35 = Rs1750

TOPIC: TRIANGLES

1. Two circles of any radius are always:

(i) Congruent. (ii) Similar (iii) Almost same (iv) Copy

2. If all the three angles of a triangle are equal to corresponding three angles of another triangle, then the triangles are said to be:

(i) Similar but not congruent. (ii) Congruent but not similar. (iii) Can be both similar as well as congruent. (iv) Neither similar nor congruent.

3. If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the other two sides are divided in the same …….

(i) Ratio. (ii) Size. (iii) Parts. (iv) Lengths

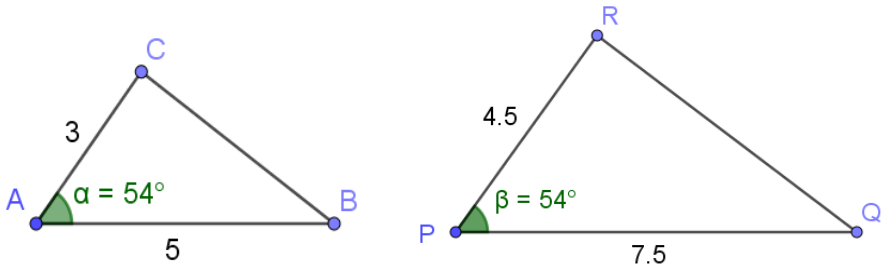
4. If a line divides any two sides of a triangle in the same ratio, then the line is ……. to the third side.

(i) Equal. (ii) Similar. (iii) Not equal. (iv) Parallel

5. Name of the longest side in a right-angled triangle is …….

(i) Base. (ii) Hypotenuse. (iii) Perpendicular. (iv) Diagonal

6. Name the criteria of similarity by which following triangles are similar.



(i) S.S.S. (ii) S.A.S. (iii) A.A.A. (iv) A.S.A

7. If two angles of a triangle are equal to the corresponding two angles of another triangle then in such case two triangles can be called similar.

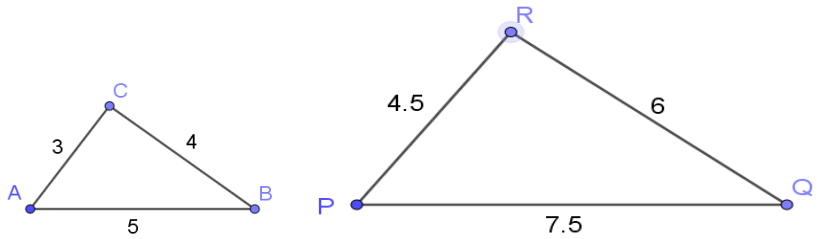
(i) True. (ii) False

8. For any two similar triangles which of the following statements are valid:

(i) Their sides are proportional.

(ii) Their sides are always in the same ratio.
(iii)Their sides are equal
(iv)Their sides are parallel.

9. Name the criteria of similarity by which following triangles are similar.



(i) S.S.S. (ii) S.A.S. (iii) A.A.A. (iv) A.S.A

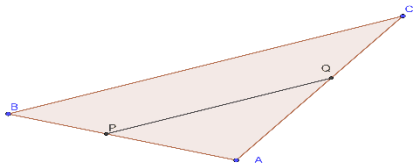
10. In a right-angled triangle ABC, angle C = 35 degree and in another right-angled triangle PQR angle R = 35 degree. Then relation between the two triangles is:

(i) Congruent. (ii) Equal. (iii) Similar. (iv) No relation

11. If triangle ABC is similar to triangle PRQ then which of the following is true:

(i) AB = PQ. (ii) AC = PQ. (iii) AB = QR. (iv) BC = QR

12. In the given triangle ABC, line PQ is parallel to side BC, then angle B = angle P because they are:



(i) Alternate interior angles. (ii) Allied angles. (iii) Adjacent angles. (iv) Corresponding angles

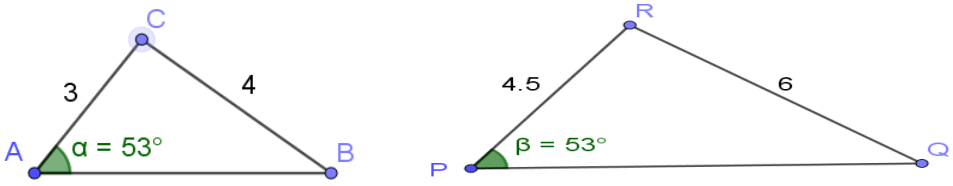
13. If two triangles are similar then the ratio of their areas is equal to:

(i) Ratio of their corresponding sides.
(ii) Ratio of any two sides.
(iii) Ratio of squares of their corresponding sides.
(iv) Ratio of squares of any two sides.

14. In a right-angled triangle, the square of the hypotenuse is equal to the

(i) Sum of other two sides
(ii) Sum of squares of other two sides containing right angle.
(iii) Square of the perpendicular.
(iv) Square of the base.

15. Name the criteria of similarity by which following triangles are similar.



(i) Not similar. (ii) A.S.S (iii) S.S.S (iv) S.A.S

16. For any two similar triangles the ratio of their sides is equal to the ratio of

(i) Their medians. (ii) Their altitudes. (iii) Their angle bisectors. (iv) All of these.

17. The sides of two similar triangles are in the ratio 7:9, then what is the ratio of their areas?

(i) 7:9 (ii) 14:18 (iii) 9:7 (iv) 49:81

18. Which of the following is a Pythagorean triplet?

(i) 3, 5, 7. (ii) 6, 8, 10. (iii) 10, 14, 18. (iv) 11, 12, 13.

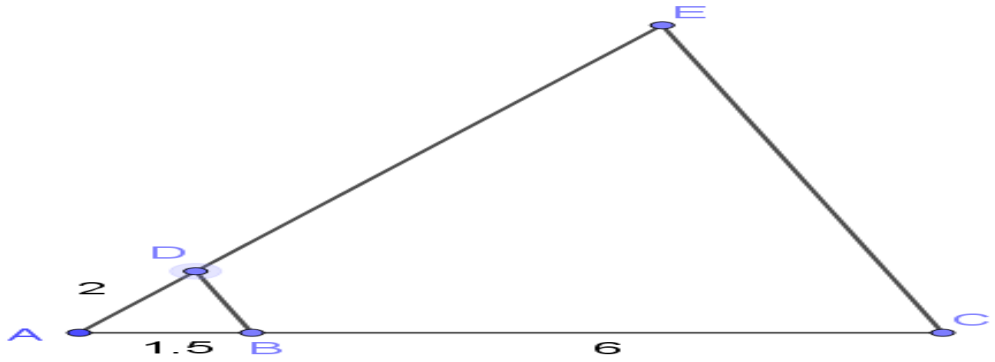
19. The length of diagonal of a rectangle can be found using which theorem?

(i) Converse Pythagoras Theorem. (ii) Pythagoras theorem. (iii) Converse Basic Proportionality Theorem. (iv) Basic Proportionality Theorem

20. If ABC is an isosceles right-angled triangle, right angled at C. Then

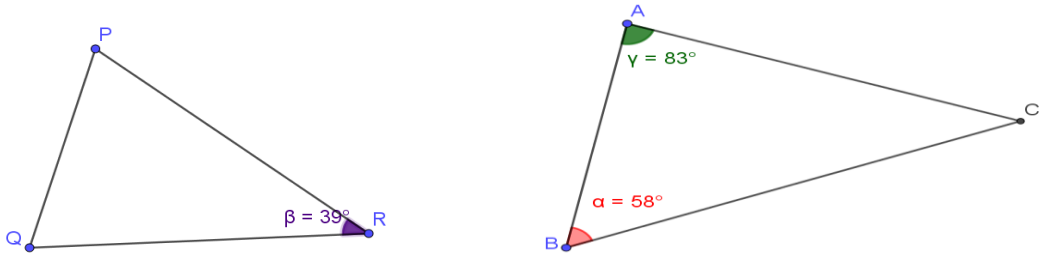
(i) $AB^2 = 2\ AC^2$. (ii) $AC^2 = 2\ AB^2$. (iii) $AB^2 = 4\ AC^2$. (iv) $AC^2 = 4\ AB^2$.

21. In the given figure line BD is parallel to CE. AB = 1.5 cm, BC = 6 cm, AD = 2 cm. Find DE.



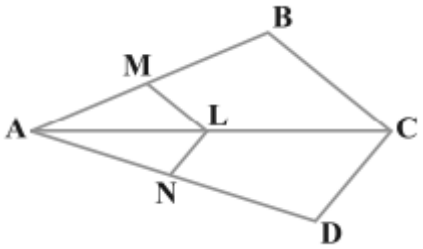
(i) 6 cm (ii) 8 cm (iii) 4 cm (iv) cannot be found.

22. Check the relation between the following triangles:



(i) Similar by S.A.S (ii) Similar by A.A.A (iii) Similar by S.S.S (iv) Similar by A.S.S

23. In the following figure LM is parallel to BC and LN is parallel to CD then which of the following relation is true:



(i) $\frac{AM}{AB} = \frac{AN}{AD}$ (ii) $\frac{ML}{BC} = \frac{AL}{AC}$ (iii) Both of (i) &(ii) (iv) Neither of these

24. To place a pole vertical on the ground a guy wire of length 26 m is attached to it at a point 10 m away from its foot. Then what will be the length of pole.

(i) 10 m. (ii) 28 m (iii) 20 m (iv) 24 m

25. In a triangle if the square of its longest side is equal to the sum of squares of other two sides, then it is a right-angled triangle. This statement is called:

(i) Pythagoras Theorem. (ii) Converse Pythagoras Theorem. (iii) Thales Theorem. (iv) Converse of Thales Theorem.

26. **A: Assertion:** 3,4,5 is called a Pythagorean Triplet.

R: Reason: If in a set of three numbers the square of greatest number is equal to the sum of squares of other two numbers then they are called Pythagorean Triplet.

(i) Both A and R are true and R is the correct reason of A.

(ii) Both A and R are true and R is not the correct reason of A.
(iii) A is true but R is false.
(iv) A is false but R is true.

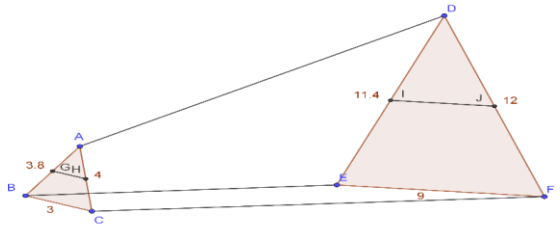
27. **A: Assertion:** A line drawn parallel to any one side of a triangle intersects the other two sides proportionally.
R: Reason: Parallel lines cannot be drawn to any one side of a triangle.
(i) Both A and R are true and R is the correct reason of A.
(ii) Both A and R are true and R is not the correct reason of A.
(iii) A is true but R is false.
(iv) A is false but R is true.

28. E and F are the points on the sides PQ and PR respectively of a triangle PQR. PE = 4 cm, QE = 4.5 cm, PF = 8 cm and RF = 9 cm.
A: Assertion: EF is not parallel to QR
R: Reason: In a triangle if two sides are divided proportionally by a line then the line is parallel to the third side.
(i) Both A and R are true and R is the correct reason of A.
(ii) Both A and R are true and R is not the correct reason of A.
(iii) A is true but R is false.
(iv) A is false but R is true.

29. **A: Assertion:** If two angles of any triangle are equal to the corresponding two angles of another triangle then the third angles are not necessarily equal.
R: Reason: The sum of three angles of any triangle is equal to 180°
(i) Both A and R are true and R is the correct reason of A.
(ii) Both A and R are true and R is not the correct reason of A.
(iii) A is true but R is false.
(iv) A is false but R is true.

30. **A: Assertion:** If any two sides of a triangle are proportional to corresponding two sides of another triangle and the included angles are equal then the triangles are similar by SAS similarity criterion.
R: Reason: If the equal angles are not included between the proportional sides, then SAS criterion will be void.
(i) Both A and R are true and R is the correct reason of A.
(ii) Both A and R are true and R is not the correct reason of A.
(iii) A is true but R is false.
(iv) A is false but R is true.

31. Bhaskar went for hiking with scouts' team and there the scouts were given a task to build tents with the help of bamboos, ropes and canvas. The frame of the tent that Bhaskar prepared was of pyramid shape. To make it sturdier Bhaskar thought that he should fix a wooden stick on the triangular sides of the tent and fix the wooden stick at the mid points of the sides of two sides of the triangle. The distance between the end point of the bamboos on the sides was 3 m. Due to lack of even length bamboo sticks Bhaskar the triangles on the edges of tent were not congruent. Look into the figure of Bhaskar's tent and answer the following questions.



(a) To make tent sturdy Bhaskar used bamboo IJ in the back part of the tent. What length of bamboo shall he use so that it should be fixed exactly?

(i) 9 m. (ii) 4.5 m. (iii) 3 m. (iv) 6 m

(b) Using which property of triangles Bhaskar was able to find the length of GH and IJ.

(i) Pythagoras Property. (ii) Basic Proportionality Theorem. (iii) Mid- point theorem. (iv) Exterior angle property.

(c) How can Bhaskar find the area of canvas used only to cover the triangles?

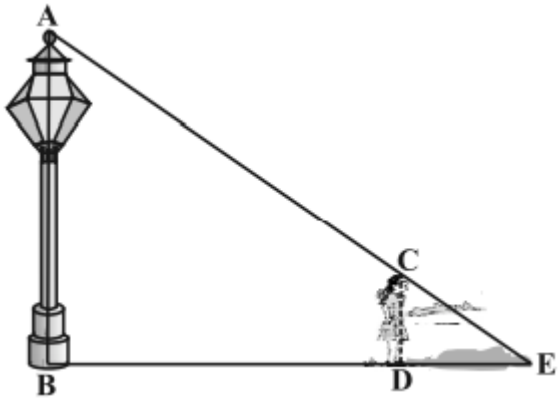
(i) Heron's Formula. (ii) Pythagoras Property. (iii) Area = ½ X Base X Height. (iv) Section Formula.

(d) Here BC: EF = 3: 9, then what will be the ratio of area of triangle ABC to area of triangle DEF.

(i) 9:3 (ii) 9:81 (iii) 3.8: 11.4 (iv) 1:9

(e) What is the value of ratio AG: GB? (i) 3.8 : 4 (ii) 1:1 (iii) 9: 12 (iv) 4 : 3

32. Geetansha was standing in the ground in front of ATC tower in air force station Hindon. The officer on duty Flight Lieutenant Aman focused the search light of the ATC tower on Geetansha and her shadow was formed on the ground. Look into the figure given below where AB is the ATC tower, CD is Geetansha and DE is her shadow and answer the following questions:



(a) If the height of Geetansha is 1.5 m and the length of her shadow is 6 m point E is 36 m away from the tower then what the height of the ATC tower is.

(i) 6 m (ii) 9 m (iii) 12 m (iv) 15 m

(b) If Geetansha moves 2 m towards the tower then the length of shadow will:

(i) Increase (ii) Decrease (iii) Remain same (iv) Mathematically cannot calculated.

(c) Using the data in part (a) of this question find the value of AC: CE

(i) 1: 4 (ii) 1: 5 (iii) 4:1 (iv) 5 : 1

(d) Which of the following relations is true?

(i) AB: CD = AC: CE (ii) AB:CD = AE: CE (iii) AB: CD = AE:AC (iv) AB: CD = BE: DE

(e) If Geetansha moves away from the tower at a speed of 1.2 m/s then what will be length of her shadow after 5 seconds.

(i)7.2 m (ii) 6.0 m (iii) 8.4 m (iv) 9.6 m

ANSWER KEY

1. (ii) Similar.
2. (i) Only Similar but not congruent.
3. (i) Ratio
4. (iv) Parallel
5. (ii) Hypotenuse.
6. (ii) S.A.S
7. (i) True
8. (i) Their sides are proportional. (ii) Their sides are always in the same ratio.
9. (i) S.S.S.
10. (iii) Similar. {As one angle is 35 degree and they are right-angled triangles so by default one angle of 9o degrees will also be equal. SO they are similar by A,A criterion}
11. (ii) AC = PQ. (iv) BC = QR
12. (iv) Corresponding angles
13. (iii) Ratio of squares of their corresponding sides.
14. (ii) Sum of squares of other two sides containing right angle.
15. (i) Not similar
16. (iv) All of these.
17. (iv) 49:81
18. (ii) 6, 8, 10.
19. (ii) Pythagoras theorem.
20. (i) $AB^2 = 2\ AC^2$
21. (ii) 8 cm
22. (ii) Similar by A.A.A
23. (iii) Both of (i) &(ii)
24. (iv) 24 m
25. (i) Pythagoras Theorem.
26. (i) Both A and R are true and R is the correct reason of A.{self explanatory}
27. (iii) A is true but R is false. {Explanation: Assertion is the statement of B.P.T and reson is false as we can draw a line parallel to any one side of a triangle}
28. (iv) A is false but R is true. {Explanation: In the triangle given PE: PF = 4: 8 = 1:2. QE: RF= 4.5 :9 = 1: 2. Hence PE:PF = QE: RF. So, by converse of B.P.T we get EF is parallel to QR}
29. (iv) A is false but R is true. {Explanation: We know that if two angles of a triangle are equal to corresponding two angles of another triangle then by angle sum property of a triangle it is necessary that third angles will also be equal.}
30. (ii) Both A and R are true and R is not the correct reason of A. {Explanation: Clearly here A and R has no relation}
31. (a) (ii) 4.5 m. { IJ = ½ EF by mid-point theorem}
    (b) (ii) Basic Proportionality Theorem. (iii) Mid- point theorem {Since Mid-point theorem is a special case of Basic Proportionality Theorem.}
    (c) (i) Heron's Formula.
    (d) (ii) 9:81 (iv) 1:9 {Explanation: Using area proposition theorem}
    (e) (ii) 1:1 {Since G is the mid-point of AB}
32. (a) (ii) 9 m {Explanation: AB: CD = BE: DE by B.P.T}
    (b) (ii) Decrease {When Geetansha moves 2 m towards the tower BD = 34 m, AB = 9 m, CD = 1.5 m, DE = ?. AB: CD = BE:DE , Solving we get DE = 5.6m. Which is a decrease}
    (c) (iv) 5 : 1 {Explanation: AC:CE = BD:DE = 36-6: 6 = 30: 6 = 5: 1}

(d) (ii) AB:CD = AE: CE (iv) AB: CD = BE: DE

(e) (i) 7.2 m {Explanation: When Geetansha moves away from the tower at the speed of 1.2 m/s and time taken is 5 secs. The new position of point D is shifted by = 1.2X 5 = 6 m.
Now BD = 30+6 = 36 m. Let the length of new shadow be x m.
BE : DE = AB: CD
36+x : x = 9 :1.5 . Solving this relation we can get the value of x}

CO-ORDINATE GEOMETRY

Objective Type questions

Q1.The distance of the point (3,5) from the X-axis is:
(a)3 units (b) 5 units (c)8 units (d)4 units

Q2. If the distance between A(k,3) and B(2,3) is 5, then the value of k is:
(a)5 (b)6 (c)7 (d) 8

Q3. If the points A(4,3) and B (x,5) are on the circle with centre O(2,3), then the value of x is :
(a) 5 (b)6 (c)2 (d) 4

Q4.Which of the points A(1,3), B(-3,2), C(3,4) and D(4,1) is nearest to the origin:
(a) A (b)B (c) C (d) D

Q5.If the point (x,y) is equidistant from the point(2,1) and(1,-2), then:
(a) x+3y=0 (b)3x+y=0 (c) x+2y=0 (d) 3x+2y=0

Q6. If points A(5,p), B(1,5), C(2,1) and D(6,2) form a square ABCD , then p=
(a)7 (b)3 (c)6 (d)8

Q7.The perimeter of the Triangle formed by the points (0,0), (2,0) and (0,2) is:
(a) 1- $2\sqrt{2}$ (b)$2\sqrt{2}+1$ (c) 4+ $\sqrt{2}$ (d) 4 +$2\sqrt{2}$

Q8. The x – Coordinate of a point P is twice its Y- Coordinate. If P is equidistant from Q (2,-5)and R(-3,6), Then the Coordinates of P are:
(a) (16,8) (b) (14,7) (c)(18,9) (d) (10,5)

Q9.The distance between the points P(a sin ∅, 0) and Q (0, -a cos∅) is:
(a) a^2 (b)1 (c) 2a (d) a

Q10.The Coordinates of the image of the point (-4,5) in Y-axis is:
(a) (4,5) (b) (4, -5) (c) (-4,-5) (d) (0,5)

Q11. In what ratio does the point P(3,4) divided the line segment joining the points A (1,2) and B(6,7):
(a) 1:2 (b) 2:3 (c) 3:4 (d) 1:1

Q12. The ratio in which the X-axis divides the line segment joining A(3,6) and B(12,-3) is :
(a)2:1 (b)1:2 (c) -2:1 (d) 1:-2

Q13.Ratio in which the line 3x+4y=7 divides the line segment joining the points (1,2) and

(-2,1) is:

(a) 3:5 (b)4:6 (c) 4:9 (d)3:4

Q14. If four vertices of a parallelogram taken in order are (-3,-1), (a,b), (3,3) and (4,3), then a:b=

(a) 1:4 (b) 4:1 (c) 1:2 (d) 2:1

Q15.If A and B are the points (-3,4) and (2,1) respectively , then the coordinates of the point on AB produced such that AC=2BC are:

(a)(2,4) (b) (3,7) (c) (7,-2) (d) (7,-9)

Q16. P (5,-3) and Q (3,y) are the points of trisection of the line segment joining A (7,-2) and B(1,-5) , then y equals:

(a) 2 (b) 4 (c) -4 (d) -5/2

Q17.The point which divides the line segment joining the points (7,-6) and (3,4) in ratio 1:2 internally lies in the:

(a) I quadrant (b) II quadrant (c) III quadrant (d) IV quadrant

Q18.If the points A(1,2), B(0,0) and C (a,b) are colinear, then:

(a) a=b (b) a=2b (c) 2a=b (d) a=-b

Q19.AOBC is a rectangle whose three vertices are A(0,3), O(0,0) and B(5,0). The length of its diagonal is:

(a) 5 (b) 3 (c)$\sqrt{34}$ (d) 4

Q20. The centroid of the triangle whose vertices are (3,-7), (-8,6) and (5,10) is :

(a) (0,3) (b) (0,9) (c) (1,3) (d) (3,5)

ASSERTION REASONING QUESTIONS

DIRECTION : In the following questions, a statement of assertion (A) is followed by a statement of reason (R).

Mark the correct choice as: (a)Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(b)Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(c)Assertion (A) is true but reason (R) is false.

(d)Assertion (A) is false but reason (R) is true.

1. Assertion : The point which divides the line joining the points A(1, 2) and B(- 1, 1) internally in the ratio 1: 2 is $(\frac{-1}{2}, \frac{5}{3})$

   Reason : The coordinates of the point P(x, y) which divides the line segment joining the points A(x_1 , y_1) and B(x_2 , y_2) in the ratio $m_1 : m_2$ is $\left(\frac{m_1x_2+m_2x_1}{m1+m2}, \frac{m_1y_2+m_2y_1}{m1+m2}\right)$

2. Assertion : The point on the X -axis which if equidistant from the points A(- 2, 3) and B(5, 4) is (2, 0)

   Reason : The coordinates of the point P(x, y) which divides the line segment joining the points A(x_1 , y_1) and B(x_2 , y_2) in the ratio $m_1 : m_2$ is $\left(\frac{m_1x_2+m_2x_1}{m1+m2}, \frac{m_1y_2+m_2y_1}{m1+m2}\right)$

3. . Assertion : Ratio in which the line 3x + 4y = 7 divides the line segment joining the points (1, 2) and (- 2, 1) is 3 : 5

   Reason : The coordinates of the point P(x, y) which divides the line segment joining the points A(x_1 , y_1) and B(x_2 , y_2) in the ratio $m_1 : m_2$ is $\left(\frac{m_1x_2+m_2x_1}{m1+m2}, \frac{m_1y_2+m_2y_1}{m1+m2}\right)$

4. Assertion : C is the mid-point of PQ, if P is (4, x), C is (y,- 1) and Q is (- 2, 4), then x and y respectively are -6 and 1.

   Reason : The mid-point of the line segment joining the points P(x_1 , y_1) and Q(x_2 , y_2) is $\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$

5. Assertion : The point (0, 4) lies on y -axis.
   Reason : The x co-ordinate on the point on y -axis is zero
6. Assertion : The value of y is 6, for which the distance between the points P(2,- 3) and Q(10, y) is 10.
   Reason : Distance between two given points A(x_1 , y_1) and B(x_2 , y_2) is given by, $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
7. Assertion : The point (-1, 6) divides the line segment joining the points (-3, 10) and (6, -8) in the ratio 2 : 7 internally.
   Reason : Three points A,B and C are collinear if AB + BC = AC
8. . Assertion : The possible values of x for which the distance between the points A(x, - 1) and B(5, 3) is 5 units are 2 and 8.
   Reason : Distance between two given points A(x1 , y1) and B(x2 , y2) is given by, AB $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
9. Assertion : If the points A(4, 3) and B(x, 5) lies on a circle with the centre O(2,3) then the value of x is 2.
   Reason : The mid-point of the line segment joining the points P(x_1 , y_1) and Q(x_2 , y_2) is $\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$

Q10.Assertion : The co-ordinates of the point which divides the join of A(-5, 11) and B(4,-7) in the ratio 7 : 2 is (2, -3)
Reason : The coordinates of the point P(x, y) which divides the line segment joining the points A(x_1 , y_1) and B(x_2 , y_2) in the ratio m1 : m2 is $\left(\frac{m_{1x_2}+m_{2x_1}}{m1+m2}, \frac{m_{1y_2}+m_{2y_1}}{m1+m2}\right)$

CASE STUDY QUESTIONS

CASE STUDY1: Sugarcane

A man has a sugarcane with end points A(3,2) and B(7,5)

QUESTION 1: What will be the length of sugarcane?

(a) 16 units (b) 9 units (c) 25 units (d) 5 units

QUESTION 2: Now he wants to distribute a sugarcane AB for his two children equally. Then, at what point he will cut the sugarcane equally?

(a) (3,7) (b) (2,5) (c) (5,3.5)(d) (3.5,5)

QUESTION 3: The end points and mid-point of sugarcane AB are:-

(a) Collinear (b) non-collinear (c) Both (a) and (b) (d) neither (a) nor (b)

QUESTION 4: If he wants to distribute sugarcane into four equal parts (one for his wife, one each to two children and one for himself) then, the coordinates of the points which divide the sugarcane into four equal parts are

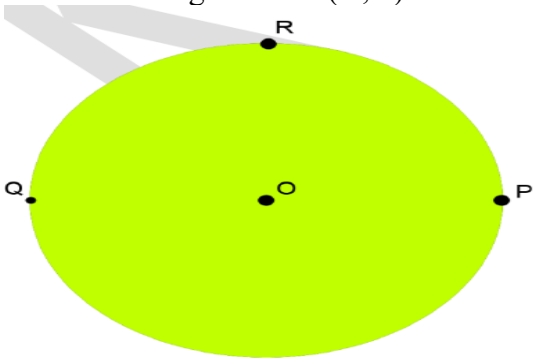
(a) (2.75 , 4) , (3 , 7) , (4.25 , 6) (b) (4 , 2.75) , (2 , 5) , (6 , 4.25)

(b) (4 , 2.75) , (5 , 3.5) , (6 , 4.25) (d) (5 , 3.5) , (3.5 , 5) , (3 , 7)

(c)

CASE STUDY 2 :CIRCULAR PARK

In a city, a circular park is situated with centre O(3 , 3). There are two exit gates P and Q which are opposite to each other. The location of exit gate 'P' is (5 , 3).



QUESTION 1: The location of exit gate 'Q' will be:-

(a) (3 , 1) (b) (3 , 3) (c) (1 , 3) (d) (5 , 3)

QUESTION 2: What will be the distance between two exit gates P and Q ?

(a) 3 units (b) 4 units (c) 5 units (d) 6 units

QUESTION 3: If a pole R(x , 5) is standing on a boundary of circular park which is equidistant from Pand Q then, the value of 'x' will be

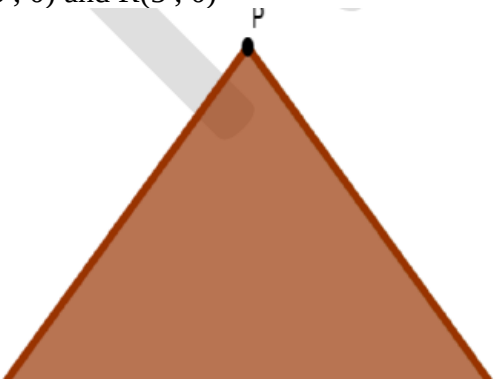
(a) 0 (b) 1 (c) 2 (d) 3

QUESTION 4: In what ratio does the centre O (3 , 3) divides the line segment joining the points P and Q?

(a) 1:1 (b) 1:2 (c) 2:1 (d) 1:4

CASE STUDY3 :Triangular Ground :-

A school has triangular shaped ground with vertices P(0 , 4) , Q(-5 , 0) and R(5 , 0)



QUESTION 1: The type of triangular ground is

(a) Equilateral (b) Scalene (c) Isosceles (d) Right-angled triangle

QUESTION 2: If Ravi has to post a flag exactly half way between the line segment joining the two points Q and R where should he post his flag?

(a)(-5 , 5) (b) (0 , 4) (c) (-5 , 0) (d) (0 , 0)

QUESTION 3: If a line is drawn with chalk powder from P to the point where flag is posted. Then, the distance between P and flag is

(a) 4 (b) 3 (c) 2 (d) 1

QUESTION 4: After drawing a line with chalk powder, then the triangular ground will be divided into two parts. Then, the ratio of areas of these two triangular parts will be

(a) 1:4 (b) 2:1 (c) 1:1 (d) 1:2

CCT4:Quadrilateral plot

Mr.Ashok has a plot of a quadrilateral shaped with vertices (0 , 0) , (a , 0), (a , b) and (0 , b)

QUESTION 1: The type of a quadrilateral shaped plot is

(a) square (b) rhombus (c) rectangle (d) trapezium

QUESTION 2: What will be the perimeter of a plot ?

(a) (a+b) units (b) 2(a+b) units (c) ab units (d) 2ab units

QUESTION 3: What will be the area of a plot ?

(a) 0 sq.units (b) a^2 sq.units (c) b^2 sq.units (d) ab sq.units

QUESTION 4: The area of each triangular part of a plot will be

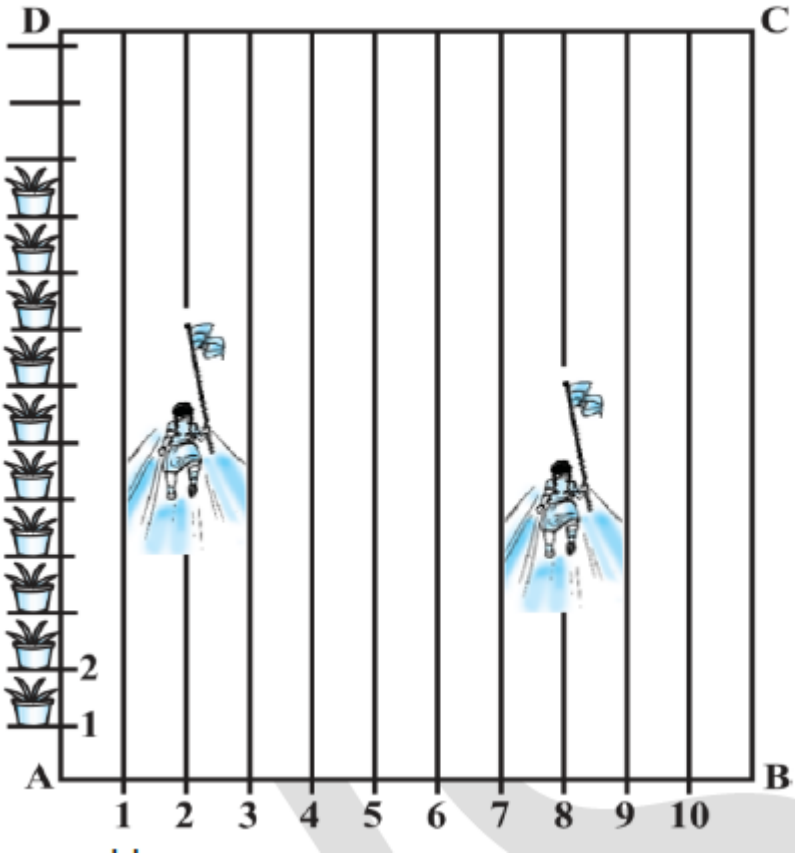
(a) ab sq.units (b) 2ab sq.units (c)1/2 ab sq units (d) ¼ ab sq units

QUESTION 5: The ratio of areas of these two triangular parts of a plot will be

(a) 1:2 (b) 2:1 (c) 1:1 (d) 1:4

CCT 5 **Sports Day Activities**

To conduct Sports Day activities, in your rectangular shaped school ground ABCD, lines have been drawn with chalk powder at a distance of 1m each. 80 flower pots have been placed at a distance of 1m from each other along AD, as shown in figure. Pushpendra runs 1/4th the distance AD on the 3rd line and posts a yellow flag. Pankaj runs 1/5 th the distance AD on the seventh line and posts a blue flag.



(source – NCERT

current position.

Based on the given situation, answer the following questions:

Q1. The coordinates of the yellow flag is:

(a) (20,3) (b) (3,20) (c) (80,3) (d) (3,80)

Q2. The coordinates of the blue flag is:

(a) (7,16) (b) (16,7) (c) (80,7) (d) (7,80)

Q3. What is the distance between both the flags?

(a) $2\sqrt{2}$ (b)$3\sqrt{2}$ (c) $4\sqrt{2}$ (d) $5\sqrt{2}$

Q4.If Raman has to post a green flag exactly halfway between the line segment joining the two flags , where should he post his flag?

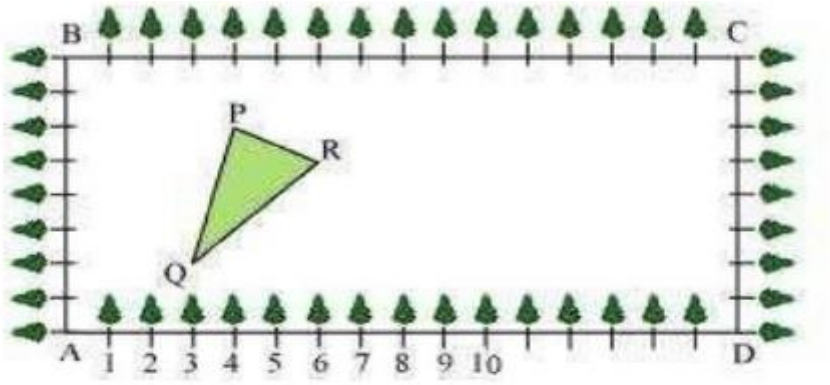
(a)16m on 4^{th} line (b) 16m on 5^{th} line (c) 18m on 4^{th} line (d) 18m on 5^{th} line

Q5. If Raman change his position and post a green flag at a point between the line segment joining the two flags , then coordinates of the green flag which divides the line segment internally in the ratio 1:2 is:

(a)$(\frac{13}{3}, \frac{56}{3})$ (b) $(\frac{56}{3}, \frac{13}{3})$ (c) $)(\frac{13}{4}, \frac{56}{3})$ (d) $)(\frac{56}{3}, \frac{13}{4})$

CCT6: Gardening

The class X students of a school in Rajinder Nagar have been alloted a rectangular plot of land for their gardening activity . Sapling of Mango are planted on the boundary at the distance of 1m from each other. There is a triangular grassy lawn in the plot as shown in the figure.



Based on the above figure, answer the following questions

Q1) Taking A as origin the coordinates of vertices of the triangle are

a) (4,6), (3,2), (6,5)
b) (3,5), (3,1), (4,8)
c) (5,6), (2,2), (6,5)
d) (2,6), (6,2), (7,4)

Q2) Perimeter of ΔPQR

a) $\sqrt{13}+4\sqrt{2}+3\sqrt{5}$
b) $\sqrt{15}+7+\sqrt{11}$
c) $\sqrt{17}+3\sqrt{2}+\sqrt{5}$
d) $\sqrt{23}+30$

Q3) The coordinates of the point M on QR is such that QM:QR = 2:1 is

a) (4,3)
b) (5,4)
c) (5,3)
d) (2,3)

Q4) What are the coordinates of P if D is origin.

a) (9,4)
b) (-12,6)
c) (11,6)
d) (-6, 12)

Answers of Objective Questions

Q1 (b) 5 units

Q2 (c) 7

Q3 (c) 2

Q4 (a) A

Q5 (a) x+3y=0

Q6 (c) 6

Q7 (d) $4+2\sqrt{2}$

Q8 (a) (16,8)

Q9 (d) a

Q10 (a) (4,5)

Q11 (b) 2:3

Q12 (a) 2:1

Q13 (c) 4:9

Q14 (b) 4:1

Q15 (c) (7, -2)

Q16 (c) -4

Q17(d) IV quadrant

Q18 (c) 2a=b

Q19 (c) $\sqrt{34}$

Q20 (a) (0,3)

ASSERTION REASONING ANSWERS

Q1.We know that the coordinates of the point $P(x, y)$ which divides the line segment joining the points $A(x1, y1)$ and $B(x2, y2)$ in the ratio m1 : m2 is $\left(\frac{m_1x_2+m_2x_1}{m1+m2}, \frac{m_1y_2+m_2y_1}{m1+m2}\right)$ So, Reason is correct.

Here, x1 = 1, y1 = 2, x2 = -1, y2 = 1, m1 = 1, m2 = 2

Now, x-coordinate =1/3

and y-coordinate =5/3

So, Assertion is correct

Correct option is (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion

Q2. We know that the coordinates of the point $P(x, y)$ which divides the line segment joining the points $A(x1, y1)$ and $B(x2, y2)$ in the ratio m1 : m2 is $\left(\frac{m_1x_2+m_2x_1}{m1+m2}, \frac{m_1y_2+m_2y_1}{m1+m2}\right)$ So, Reason is correct.

Let $P(x, 0)$ be a point on X -axis such that, $AP = BP$

$\Rightarrow AP2 = BP2$

$\Rightarrow (x + 2)2+ (0 – 3)2 = (x – 5)2 + (0 + 4)2$

$\Rightarrow x2 + 4x + 4 + 9 = x2 – 10x + 25 + 16$

Hence, required point = (2, 0)

So, Assertion is correct

Correct option is (b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A)

Q3. We know that the coordinates of the point $P(x, y)$ which divides the line segment joining the points $A(x1, y1)$ and $B(x2, y2)$ in the ratio m1 : m2 is $\left(\frac{m_1x_2+m_2x_1}{m1+m2}, \frac{m_1y_2+m_2y_1}{m1+m2}\right)$ So, Reason is correct

Let the ratio is k : 1. Here, x1 = 1, y1 = 2, x2 = -2, y2 = 1, m1 = k, m2 = 1

Now, x-coordinate = -2k+1/k+1

and y-coordinate =k+2/k+1

Now, $3x + 4y = 7$

$\Rightarrow$ k=4/9

So, Assertion is not correct

Correct Option is (d) Assertion (A) is false but reason (R) is true

Q4. We know that the mid-point of the line segment joining the points $P(x1, y1)$and $Q(x2, y2)$ is $\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$

So, Reason is correct.

Since, $C(y,- 1)$ is the mid-point of $P(4, x)$ and $Q(- 2, 4)$.

We have

Y=1

x = -6

So, Assertion is correct

Correct option is (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

Q5. We know that the if the point lies on y-axis, its x-coordinate is 0.
So, Reason is correct.
The *x* co-ordinate of the point (0, 4) is zero.
So, Point (0, 4) lies on *y* -axis.

So, Assertion is also correct

Correct option is (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

Q6. We know that the Distance between two given points *A*(*x*1, *y*1) *and B*(*x*2, *y*2) is given by, AB = $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

So, Reason is correct.
Now, PQ = 10 ⇒ PQ2 = 100
⇒ (10 – 2)2 + (y + 3)2 = 100
⇒ (y + 3)2 = 100 – 64 = 36
⇒ y + 3 = ±6
⇒ y = -3 ± 6 ⇒ y = 3, -9

So, Assertion is not correct

Correct option is (d) Assertion (A) is false but reason (R) is true.

Q7. We know that the three points *A*,*B* and *C* are collinear if AB + BC = AC
So, Reason is correct.
Let the ratio is k : 1. Here, x1 = -3, y1 = 10, x2 = 6, y2 = -8, x = -1, y = 6
Now, y-coordinate $\frac{m_1y_2+m_2y_1}{m1+m2}$=6
⇒ -8k + 10 = 6k + 6
⇒ 10 – 6 = 6k + 8k
⇒ 14k = 4
⇒ k = 2/7
So, Assertion is correct

But reason (R) is not the correct explanation of assertion (A).

Correct Option is (b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

Q8. We know that the Distance between two given points *A*(*x*1, *y*1) *and B*(*x*2, *y*2) is given by, AB = $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
So, Reason is correct.
Now, AB = 5 ⇒ AB2 = 25
⇒ (x – 5)2 + (-1 - 3)2 = 25
⇒ (x – 5)2 = 25 – 16 = 9
⇒ x – 5 = ±3
⇒ x = 5 ± 3 ⇒ x = 2, 8

So, Assertion is also correct

Correct option is (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

Q9. We know that the mid-point of the line segment joining the points *P*(*x*1, *y*1) and *Q*(*x*2, *y*2) is $\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$

So, Reason is correct.

Given, the points A (4,3) and B (x, 5) lie on a circle with center O(2,3).
Then OA = OB ⇒(OA)2 = (OB)2
⇒(4 – 2)2 + (3 – 3)2 = (x – 2)2 + (5 – 3)2
⇒(2)2 +(0)2 =(x – 2)2 + (2)2

⇒ x – 2 = 0

X=2

So, Assertion is correct

Correct option is (b) Both assertion (A) and reason (R) are true and but reason (R) is not the correct explanation of assertion (A)

Q10. We know that the coordinates of the point $P(x, y)$ which divides the line segment joining the points $A(x1, y1)$ and $B(x2, y2)$ in the ratio m1 : m2 is $\left(\frac{m_1x_2+m_2x_1}{m1+m2}, \frac{m_1y_2+m_2y_1}{m1+m2}\right)$ So, Reason is correct.

Here, x1 = -5, y1 = 11, x2 = 4, y2 = -7, m1 = 7, m2 = 2

Now, x-coordinate =2

and y-coordinate = -3

Correct option is (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A)

CASE STUDY

CASE STUDY 1: SUGARCANE

Q1 : (d) 5 units

Q2 : (c) (5 , 3.5)

Q3 : (a) collinear

Q4 : (c) (4, 2.75),(5, 3.5),(6, 4.25)

CASE STUDY 3 :Triangular Ground

Q1 : (c) Isosceles

Q2 : (d) (0,0)

Q3 : (a) 4

Q4 : (c) 1:1

CASE STUDY 4: Quadrilateral plot

CASE STUDY 5 : Sports Day activities

Q1: (b) (3,20)

Q2: (a) (7,16)

Q3: (c) $4\sqrt{2}$

Q4: (d) 18 m on 5^{th} line

Q5: (a)($\frac{13}{3}$,$\frac{56}{3}$)

CASE STUDY 2: CIRCULAR PARK

Q1 : (c) (1,3)

Q2 : (b) 4 units

Q3 : (d) 3

Q4 : (a) 1:1

Q1 : (c) Rectangle

Q2 : (b) 2(a+b)

Q3 : (d) ab sq.units

Q4 : (c) ½ absq.units

Q5 : (c) 1:1

CASE STUDY 6 Gardening

Q1 (a) (4,6), (3,2), (6,5)

Q2 (c) $\sqrt{17}+3\sqrt{2}+\sqrt{5}$

Q3 (b)(5,4)

Q4 (b) (-12,6)

INTRODUCTION TO TRIGONOMETRY

1. If **cosA** = $\frac{4}{5}$, then the value of **tanA** is

(a) $\frac{3}{5}$ (b) $\frac{3}{4}$ (c) $\frac{4}{3}$ (d) $\frac{5}{3}$

2. If **sinA** = $\frac{1}{2}$, then the value of **cotA** is

(a) $\sqrt{3}$ (b)$\frac{1}{\sqrt{3}}$ (c) $\frac{\sqrt{3}}{2}$ (d) 1

3. If **sinΘ** = $\frac{a}{b}$, then **cosΘ** is equal to

(a) $\frac{b}{\sqrt{b^2-a^2}}$ (b) $\frac{\sqrt{b^2-a^2}}{a}$ (c) $\frac{\sqrt{b^2-a^2}}{b}$ (d) $\frac{a}{\sqrt{b^2-a^2}}$

4.Given that **sin a** = $\frac{\sqrt{3}}{2}$ and **cosb = 0**, then the value of **b - a** is

(a) 0^0 (b) 90^0 (c) 60^0 (d) 30^0

5. If Δ ABC is right angled at C , then the value of **sec(A + B)** is

(a) 0 (b) 1 (c) $\frac{2}{\sqrt{3}}$ (d) not defined

6. If **sinΘ + cos Θ** = $\sqrt{2}$**cos Θ**, ($\Theta \neq 90^0$) then the value of **tan Θ** is

(a) $\sqrt{2}$ - 1 (b) $\sqrt{2}$ + 1 (c) $\sqrt{2}$ (d) - $\sqrt{2}$

7. If **cos (α + β) = 0**, then **sin(α - β)** can be reduced to

(a) cosβ (b) cos 2β (c) sinα (d) sin 2α

8. If **cos9α = sin α** and $9\alpha < 90^0$, then the value of **tan5α** is

(a) $\frac{1}{\sqrt{3}}$ (b) $\sqrt{3}$ (c) 1 (d) 0

9. If ΔABC is right angled at C , then the value of **cos(A + B)** is

(a) 0 (b) 1 (c)$\frac{1}{2}$ (d) $\frac{\sqrt{3}}{2}$

10. If **sin α**= $\frac{1}{2}$ and **cos β**=$\frac{1}{2}$, then the value of **(α + β)** is

(a) 0^0 (b) 30^0 (c) 60^0 (d) 90^0

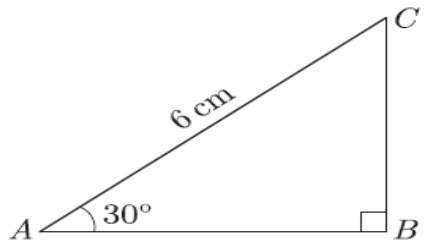
11. If **4 tan Θ = 3** , then $\left(\frac{4\sin\theta - \cos\theta}{4\sin\theta + \cos\theta}\right)$ is equal to

(a) $\frac{2}{3}$ (b) $\frac{1}{3}$ (c) $\frac{1}{2}$ (d) $\frac{3}{4}$

12. If **sin Θ - cos Θ = 0**, then the value of **$\sin^4\Theta$ + $\cos^4\Theta$** is

(a) 1 (b) $\frac{3}{4}$ (c) $\frac{1}{2}$ (d) $\frac{1}{4}$

13. In the adjoining figure, the length of *BC* is



(a) 2 $\sqrt{3}$ cm (b) 3$\sqrt{3}$ cm (c) 4 $\sqrt{3}$ cm (d) 3 cm

14. If $x = p \sec\Theta$ and $y = q \tan\Theta$, then

(a) $x^2 - y^2 = p^2q^2$ (b) $x^2q^2 - y^2p^2 = pq$ (c) $x^2q^2 - y^2p^2 = \frac{1}{pq}$ (d) $x^2q^2 - y^2p^2 = p^2q^2$

15. **($\cos^4A$ - $\sin^4A$)** is equal to

(a) 1 - 2 $\cos^2A$ (b) 2 $\sin^2A$ – 1 (c) $\sin^2A$ - $\cos^2A$ (d) 2 $\cos^2A$ – 1

16. If **tan Θ + sin Θ = *m*** and **tan Θ - sin Θ = *n***, then $m^2 - n^2$ is equal to

(a) $\sqrt{mn}$ (b)$\sqrt{\frac{m}{n}}$ (c) 4 $\sqrt{mn}$ (d) None of these

17. If **sin Θ** = $\frac{5}{13}$, then the value of **tan Θ** is ..... .

(a) $\frac{5}{13}$ (b) $\frac{5}{12}$ (c) $\frac{12}{13}$ (d) $\frac{8}{13}$

18. The value of the **$(\tan^2 60^0 + \sin^2 45^0)$** is ..... .

(a) $\frac{1}{2}$ (b) $\frac{3}{2}$ (c) 1 (d) $\frac{7}{2}$

19. **$\sin^2 60^0 - 2 \tan 45^0 - \cos^2 30^0$** = ?

(a) 2 (b) –2 (c) 1 (d) –1

20. In a triangle *ABC*, **$\cos\left(\frac{B+C}{2}\right)$** will be

(a) $\sin \frac{A}{4}$ (b) cos*A* (c) $\sin \frac{A}{2}$ (d) $\cos \frac{A}{2}$

21. The value of **$\sin^2 41^o + \sin^2 49^o$** will be

(a) 1 (b) $\sqrt{2}$ (c) 2 (d) $\sqrt{3}$

22. What happens to value of cos Θ when Θ increases from 0º to 90º.

(a) cos Θ decreases from 1 to 0. (b) cos Θ increases from 0 to 1.
(c) cos Θ increases from $\frac{1}{2}$ to 1 (d) cos Θ decreases from 1 to $\frac{1}{2}$

23. **$\tan^4 \Theta + \tan^2 \Theta$** = ?

(a) $\sec^2 \Theta - 2 \sec^4 \Theta$ (b) $2 \sec^2 \Theta - \sec^4 \Theta$
(c) $\sec^2 \Theta - \sec^4 \Theta$ (d) $\sec^4 \Theta - \sec^2 \Theta$

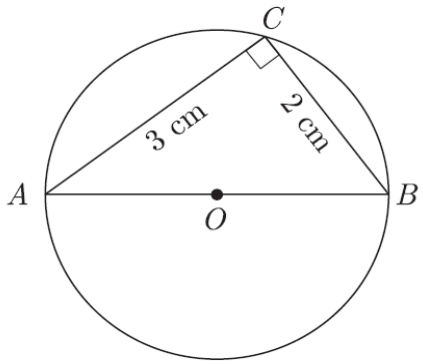
24. $\sqrt{\frac{1-Sin\theta}{1+\sin\theta}}$ **= ?**

(a) sin Θ - cos Θ (b) sec Θ - tan Θ
(c) sec Θ + tan Θ (d) sin Θ + cos Θ

25. $\frac{1-tan^2\theta}{1+tan^2\theta}$ **= ?**

(a) 1 (b) $\cos^2 \Theta - \sin^2 \Theta$ (c) $\sin^2 \Theta$ (d) $\cos^2 \Theta$

26. In the given figure, *AOB* is a diameter of a circle with centre *O*, The value of **tan*A*.tan*B*** will be



(a) 1 (b) 2 (c) $\sqrt{3}$ (d) 3

27. If $\tan 5\theta = 1$ then θ is equal to

(a) 9º (b) 90º (c) 45º (d) 30º

28. If $\tan(A + B) = \sqrt{3}$ and $\tan(A - B) = \frac{1}{\sqrt{3}}$, $A > B$, then the value of A is ..... .

(a) 45° (b) 60° (c) 90° (d) 30°

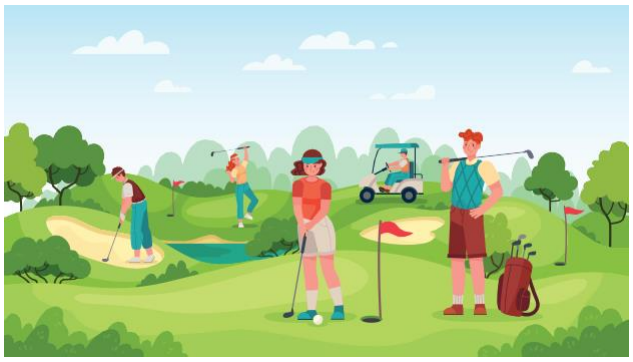
29. The value of $(1 + \tan^2\theta)(1 - \sin\theta)(1 + \sin\theta)$ =

(a) 0 (b) 1 (c) 2 (d) $\frac{1}{2}$

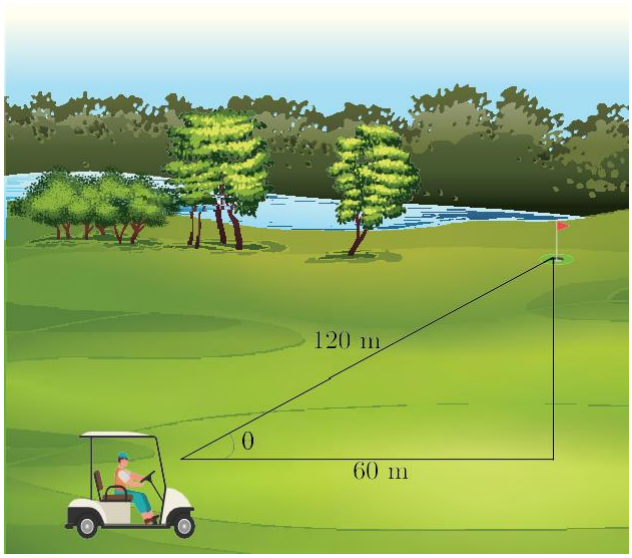
30. If $\tan A = \cot B$, then the value of $(A + B)$ is

(a) 90° (b) 120° (c) 60° (d) 180°

31. Golf is a game played in an open field where the golfer plays his golf ball into a hole by using different types of clubs (golf instruments). In golf, a golfer plays a number of holes in a given order. 18 holes played in an order controlled by the golf course design, normally make up a game.



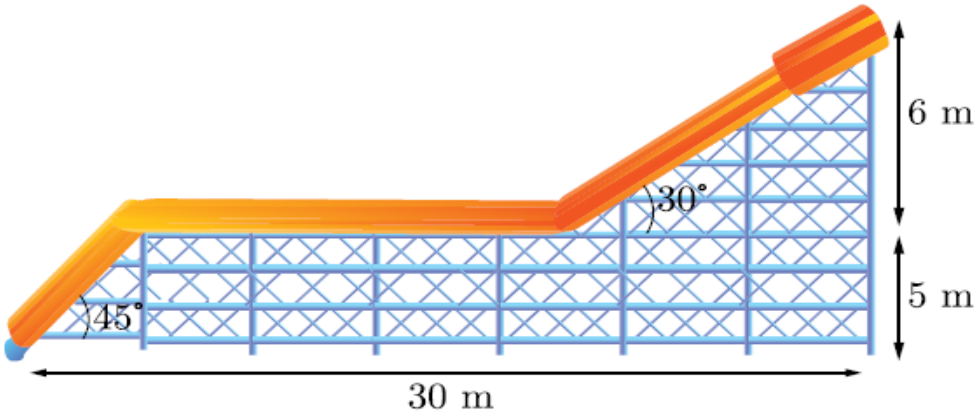
On your approach shot to the ninth green, the Global Positioning System (GPS) your cart is equipped with tells you the pin is 120 meter away. The distance plate states the straight line distance to the hole is 60 meter. Relative to a straight line between the plate and the hole, at what acute angle should you hit the shot?



(a) 60° (b) 30° (c) 90° (d) 45°

Direction For Question: (32 to 33)

Water Slide Design : Slide shown in the figure is part of a design for a water slide.
(Use $\sqrt{2}$ = 1.41 and $\sqrt{3}$ = 1.73)



32. What is the length of flat part of slide.

(a) 44.69 m (b) 22.16 m (c) 16.34 m (d) 14.62 m

33**.** What is the total length of the slide?

(a) 5.4 m (b) 21.6 m (c) 33.69 m (d) 42.2 m

Direction For Question : (34 to 35)

A heavy-duty ramp is used to winch heavy appliances from street level up to a warehouse loading dock. If the ramp is 2 meter high and the incline is 4 meter long.

(Use $\sqrt{3}$ = 1.73)

34. What angle does the dock make with the street?

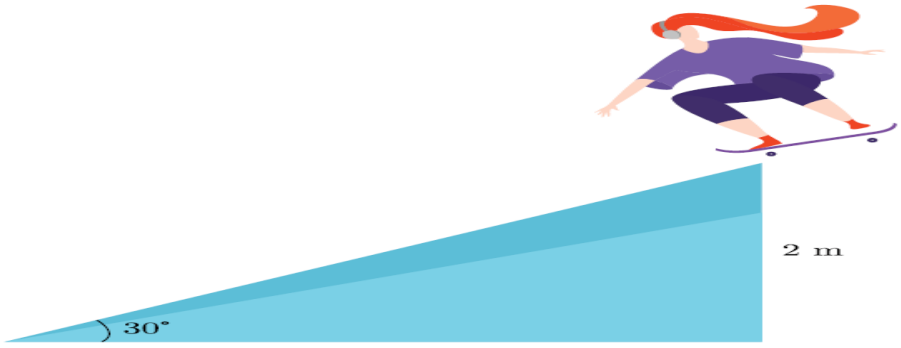
(a) 60° (b) 30° (c) 90° (d) 45°

35**.** How long is the base of the ramp? **(In round figure)**

(a) 4.1 m (b) 3.5 m (c) 5.3 m (d) 2.1 m

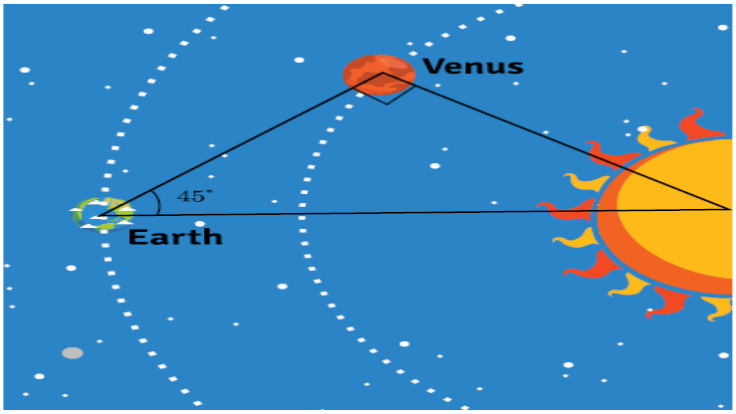
36. A skateboarder wishes to build a jump ramp that is inclined at a 30^0 angle and that has a maximum height of 2 meter. What is the horizontal width of the ramp. **(In round figure)**

(Use $\sqrt{3}$ = 1.73)



(a) 2.6 m (b) 3.5 m (c) 5.9 m (d) 4.6 m

37. Venus rotates in a nearly circular orbit around the sun. The largest angle formed by Venus, Earth, and the sun is 45^0. The distance from Earth to the sun is approximately 149 million kilometers. See the following figure. What is the orbital radius *r* of Venus? Round to the nearest million kilometers.



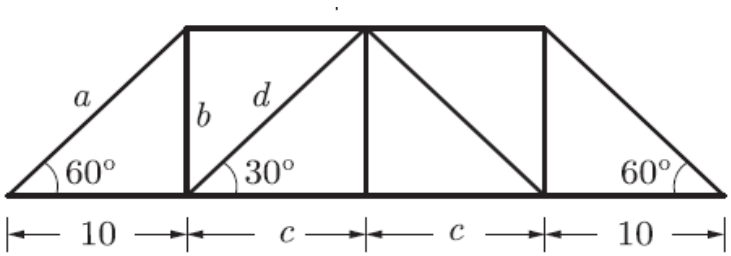
(a) 48 (b) 105 (c) 56 (d) 145

Direction For Question: (38 to 41)

A truss is a structure that consists of members organized into connected triangles so that the overall assembly behaves as a single object. Trusses are most commonly used in bridges, roofs and towers.

Consider the line diagram of truss shown below and find the following length

(Use $\sqrt{3}$ = 1.732)



38. What is the length *a*?

(a) 30 m (b) 20 m (c) 34.6 m (d) 17.32 m

39. What is the length *b* ?

(a) 30 m (b) 20 m (c) 34.6 m (d) 17.32 m

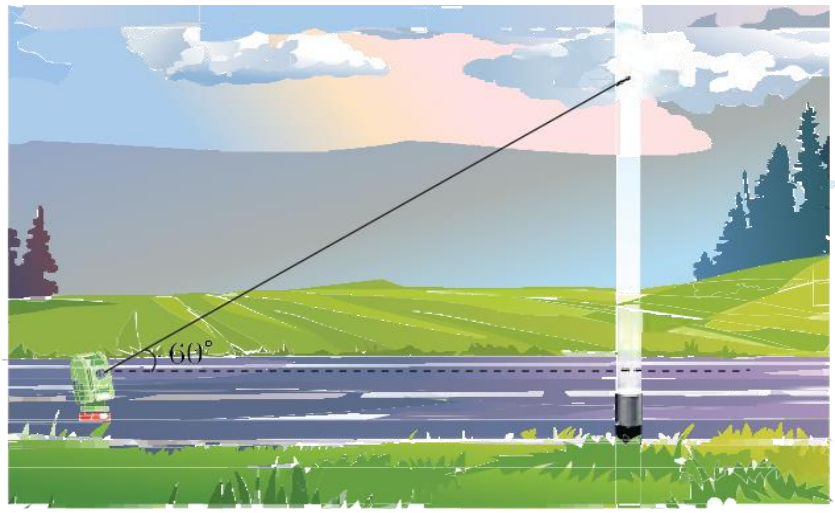
40. What is the length *c*?

(a) 30 m (b) 20 m (c) 34.6 m (d) 17.32 m

41. What is the length *d*?

(a) 30 m (b) 20 m (c) 34.64 m (d) 17.32 m

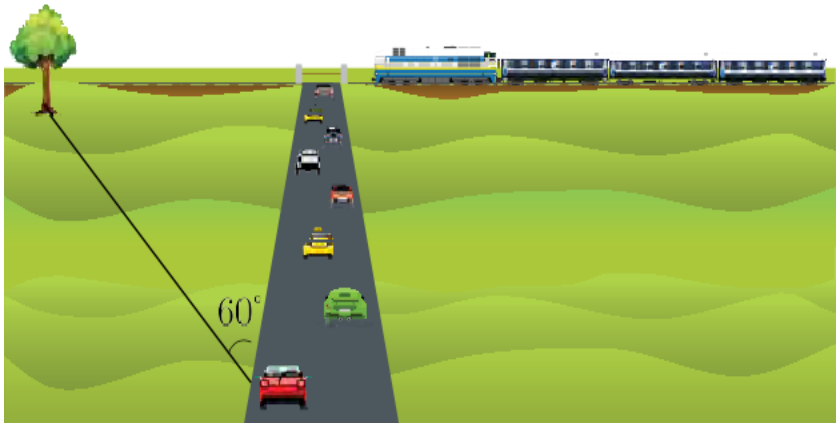
42. Meteorologists find the height of a cloud using an instrument called a ceilometer. It consists of a light projector that directs a vertical light beam up to the cloud base and a light detector that scans the cloud to detect the light beam



On July 2, 2021, at Midway Airport in Mumbai, a ceilometer was employed to find the height of the cloud cover. It was set up with its light detector 80 meter from its light projector. If the angle of elevation from the light detector to the base of the cloud was 60°, what was the height of the cloud cover? **(Rounding off to nearest Ten) (Use $\sqrt{3}$ = 1.732)**

(a) 140 m (b) 260 m (c) 210 m (d) 180 m

43. While driving to their next gig, Sarthak and the boys get stuck in a line of cars at a railroad crossing as the gates go down. As the sleek, speedy express train approaches, Sarthak decides to pass the time estimating its speed.

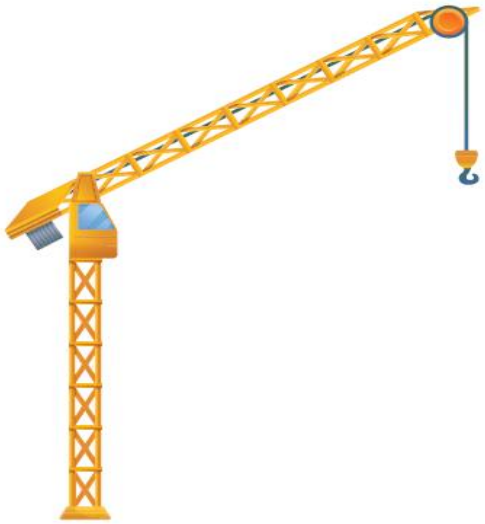


He spots a large oak tree beside the track some distance away, and figures the angle of rotation from the crossing to the tree is about 60^0 . If their car is 40 meter from the crossing and it takes the train 3 sec to reach the tree, how fast is the train moving ?

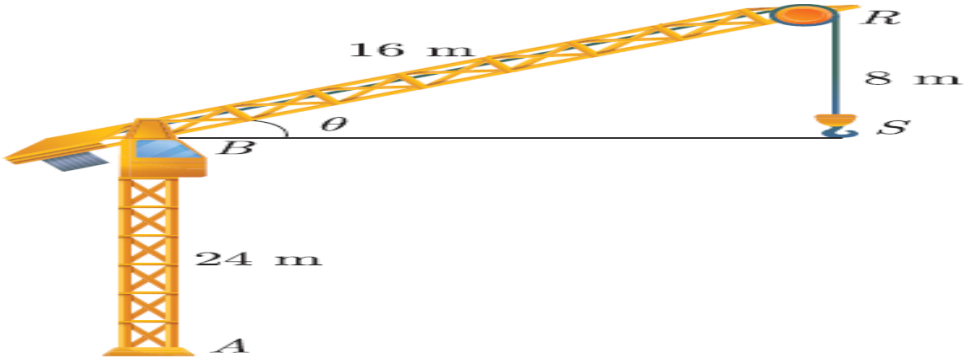
(a) 59.14 kmph (b) 83.12 kmph (c) 71.14 kmph (d) 64.16 kmph

Direction For Question: (44 to 46)

Tower cranes are a common fixture at any major construction site. They're pretty hard to miss – they often rise hundreds of feet into the air, and can reach out just as far. The construction crew uses the tower crane to lift steel, concrete, large tools like acetylene torches and generators, and a wide variety of other building materials



A crane stands on a level ground. It is represented by a tower *AB*, of height 24 m and a jib *BR*. The jib is of length 16 m and can rotate in a vertical plane about *B*. A vertical cable, *RS* , carries a load *S* . The diagram shows current position of the jib, cable and load.



44. What is the distance *BS* ?

(a) $8\sqrt{3}$ m (b) $4\sqrt{3}$ m (c) $4\sqrt{2}$ m (d) $8\sqrt{2}$ m

45. What is the angle that the jib, *BR*, makes with the horizontal ?

(a) 45° (b) 30° (c) 60° (d) 75°

46. What is the measure of the angle *BRS* ?

(a) 60° (b) 75° (c) 30° (d) 45°

ANSWER OF THE QUESTIONS :-

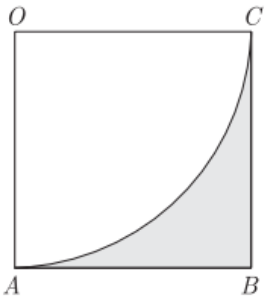
Q.NO.	Ans.	Q.NO.	Ans.	Q.NO.	Ans.	Q.NO.	Ans.	Q.NO.	Ans.
1	**b**	**11**	**C**	**21**	**a**	**31**	**a**	**41**	**c**
2	**a**	**12**	**D**	**22**	**a**	**32**	**d**	**42**	**a**
3	**c**	**13**	**D**	**23**	**d**	**33**	**c**	**43**	**b**
4	**d**	**14**	**D**	**24**	**b**	**34**	**b**	**44**	**a**
5	**d**	**15**	**D**	**25**	**b**	**35**	**b**	**45**	**b**
6	**a**	**16**	**D**	**26**	**a**	**36**	**b**	**46**	**a**
7	**b**	**17**	**B**	**27**	**a**	**37**	**b**		
8	**c**	**18**	**D**	**28**	**a**	**38**	**b**		
9	**a**	**19**	**B**	**29**	**b**	**39**	**d**		
10	**d**	**20**	**C**	**30**	**a**	**40**	**a**		

AREAS RELATED TO CIRCLE (TERM I)

1. The area of a circular ring formed by two concentric circles whose radii are 5.7 cm and 4.3 cm respectively is (Take $\pi = 3.14$)

   (a) 44 sq. cm. (b) 66 sq. cm. (c) 22 sq. cm. (d) 33 sq. cm.

2. In the adjoining figure, OABC is a square of side 7 cm. OAC is a quadrant of a circle with O as centre. The area of the shaded region is

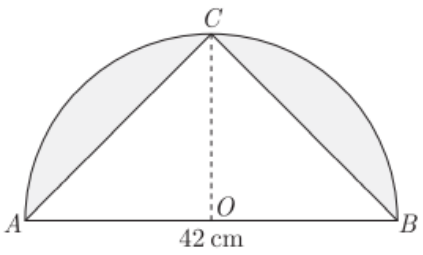


(a) 10 5 cm^2 (b) 38 5. cm^2 (c) 49 cm^2 (d) 11 5. cm^2

3. The sum of the areas of two circle, which touch each other externally, is 153 . If the sum of their radii is 15, then the ratio of the larger to the smaller radius is

(a) 4: 1 (b) 2: 1 (c) 3: 1 (d) None of these

4. In the figure, ΔACB is in the semi-circle. What is the area of shaded region given that AB = 42 cm?



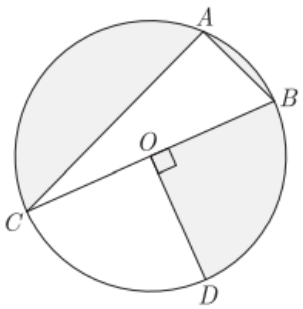
(a) 204 cm^2 (b) 224 cm^2 (c) 244 cm^2 (d) 252 cm^2

5. In the given figure, O is the centre of the circle with AC = 24 cm, AB = 7 cm and ∠BOD = 90°. What is the area of the shaded region?

   (a) 185 cm^2 (b) 284 cm^2 (c) 105 cm^2 (d) 198 cm^2

6. The diameter of a wheel is 1.26 metres. How long will it travel in 500 revolutions?

   A. 1492 B. 2530 C. 1980 D. 2880



7. Area of a sector of a circle of radius R, whose central angle is P (in degrees) is given by:

A. $\frac{P}{180}$x 2πR B. $\frac{P}{180}$x πR^2 C. $\frac{P}{180}$x $2\pi R^2$ D. $\frac{P}{360}$x $2\pi R$

8. The area of a circle is 154 cm, then its diameter is

A . $7cm$ B. $21cm$ C. $40cm$ D. $28cm$

9. The radii of two circles are 19cm and 9 cm respectively. The radius of the circle which has circumference equal to the sum of the circumference of two circles is

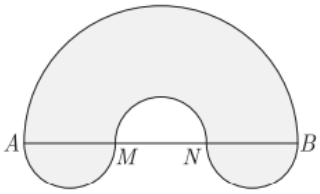
A . $35cm$ B. $10cm$ C. $28cm$ D. $21cm$

10. The area of the circle that can be inscribed in the square of side 6cm is

A . $18\pi cm$ B. $12\pi cm$ C. $9\pi cm$ D. $14\pi cm$

11. In the given figure, AB is the diameter of the largest semi-circle. AB = 21 cm, AM =MN= NB . Semicircles are drawn with AM, MN and NB as diameters as shown. What is the area of the shaded region? Use $\pi = \frac{22}{7}$

(a) 105 cm^2 (b) 210 5. cm^2 (c) 192 5. cm^2 (d) 225 cm^2



12. If the radius of a circle is diminished by 10%, then its area is diminished by

(a) 10% (b) 19% (c) 36% (d) 20%

13. The perimeter of circular field is 242 cm. The area of the field is :-
a)9317 cm^2 b)18634 cm^2 c) 4658.5 cm^2 d)None of these

14. The difference between the circumference and radius of a circle is 37 cm. The area of the circle is:-
a) 111cm^2 b) 184 cm^2 c) 154 cm^2 d) 259 cm^2

15. The circumference of two circles are in the ratio 2:3. The ratio of their areas is:-
a) 2:3 b)4:9 c) 9:4 d) none of these

16. On increasing the diameter of circle by 40%, its area will be increased by:-
a) 40% b) 80% c) 96% d) none of these

17.The area of the square is the same as the area of the circle. Their perimeter are in the ratio:-
a) 1:1 b)π:2 c) 2:π d) none of these

18. In making 1000 revolutions, a wheel covers 88 Km. The diameter of the wheel is:-
a) 14 m b) 24 m c) 28 m d) 40 m

19. The diameter of a wheel is 40 cm. How many revolutions will it make on covering 176 m ?
a) 140 b) 150 c) 160 d) 166

20. A wire is looped in the form of a circle of radius 28 cm. It is re-bent into a square form. Determine the length of the side of the square:-
a) 42 cm b) 44 cm c) 46 cm d) 48 cm

21. A road which is 7 m wide surrounds a circular park whose circumference is 352 m. Find the area of the road.

a) 2618 m^2 b) 2518 m^2 c) 1618 m^2 d) none of these

22. A paper is in the form of a rectangle ABCD in which AB = 18 cm and BC= 14cm . A semi circular portion with BC as diameter is cut off. Find the area of the remaining paper.

a) 175 cm^2 b) 165 cm^2 c) 145 cm^2 d) none of these

23. A square is inscribed in a circle of radius r. Find the area of the square in sq.units

a) $3r^2$ b) $2r^2$ c) $4r^2$ d) none of these

24. Find the area of a right angled triangle, if the radius of its circumcircle is 2.5 cm and the altitude drawn to the hypotenuse is 2 cm long.

a) 5 cm^2 b) 6 cm^2 c) 7 cm^2 d) none of these

25. The perimeter of a sector of a circle of radius 5.6 cm is 27.2 cm. Find the area of the sector.

a) 44 cm^2 b) 44.6 cm^2 c) 44.8 cm^2 d) none of these

ASSERTION AND REASONING

26.Assertion : In a circle of radius 6 cm, the angle of a sector is $60°$ Then the area of the sector is $18\frac{6}{7}$ cm^2 .

Reason : Area of the circle with radius r is πr^2 .

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion

(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

27.Assertion : If the outer and inner diameter of a circular path is 10 m and 6 m then area of the path is $16\pi\ m^2$.

Reason : If R and r be the radius of outer and inner circular path, then area of path is $\pi(R^2 - r^2)$

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d)) Assertion (A) is false but reason (R) is true

28.Assertion : If a wire of length 22 cm is bent in the shape of a circle, then area of the circle so formed is 40 cm^2 .

Reason : Circumference of the circle = length of the wire.

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true

29.Assertion : If the circumference of a circle is 176 cm, then its radius is 28 cm.
Reason : Circumference= $2 \times \pi \times radius$
(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
(c) Assertion (A) is true but reason (R) is false.
(d) Assertion (A) is false but reason (R) is true.

CASE STUDY QUESTION 1

John had a farm with many animals like cows, dogs, horses etc. He had sufficient grass land for the cows and horses to graze, One day Three of his horses were tied with 7metre long ropes at the three corners of a triangular lawn having sides 20m, 34m and 42m.

(30) Area of the triangular lawn is
(a) 326 m^2 (b) 336 m^2 (c) 306 m^2 (d) 316 m^2

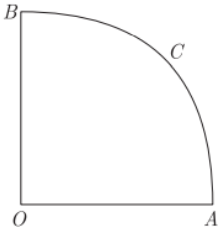
31. Find the area of the field that can be grazed by the horses
(a) 326 m^2 (b) 44m^2 (c) 306 m^2 (d) 77m^2

32. The area that cannot be grazed by the horses.

(a) 326 m^2 (b) 259m^2 (c) 336 m^2 (d) 316 m^2

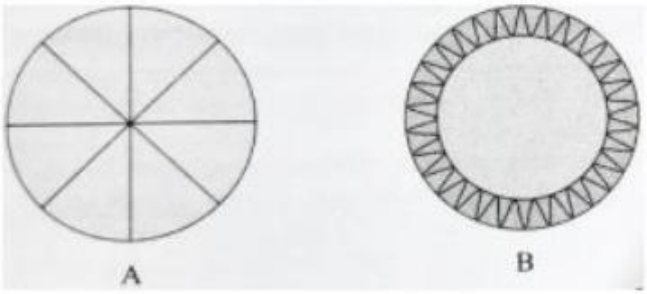
(33) The cost of fencing the triangular lawn at the rate of Rs 30 per metre, is
(a) Rs 2880 (b) Rs 2590 (c) Rs 10080 (d) Rs 3360

(34) John had a beautiful garden in the form of a quadrant of radius 7m as shown, He wanted to fence it to protect the flowers. Find the length of wire required to fence it completely.
(a) 11m (b) 18m (c) 25m (d) 36 m



CASE STUDY QUESTION 2

Raksha Bandhan, is a popular annual rite, or ceremony, which is celebrated in South Asia, and in other parts of the world significantly influenced by Hindu culture. On this day, sisters of all ages tie a talisman, or amulet, called the ***rakhi***, around the wrists of their brothers, symbolically protecting them, receiving a gift in return, and traditionally investing the brothers with a share of the responsibility of their potential care..



Observe the 2 designs of Rakhi

Design A: Rakhi **A** is made with silver wire in the form of a circle with diameter 28mm. The wire used for making 4 diameters which divide the circle into 8 equal parts.
Design B: Rakhi **B** is made of two colours - Gold and silver. Outer part is made with Gold. The circumference of silver part is 44mm and the gold part is 3mm wide everywhere.

Refer to Design A

(35). The total length of silver wire required is

a) 180 mm

b) 200 mm

c) 250 mm

d) 280 mm

(36) The area of each sector of the Rakhi is

a) 44 mm^2

b) 52 mm^2

c) 77 mm^2

d) 68 mm^2

Refer to Design B

(37) The circumference of outer part (golden) is
a) 48.49 mm

b) 82.2 mm

c) 72.50 mm

d) 62.86 mm

(38) The difference of areas of golden and silver parts is

a) 18 $\boldsymbol{\pi}$

b) 44 $\boldsymbol{\pi}$

c) 51 $\boldsymbol{\pi}$

d) 64 $\boldsymbol{\pi}$

(39). A small boy is playing with Rakhi B. He rolls the rakhi on the ground and makes revolution with it along its edge on the floor. How many complete revolutions must it take to cover 80π mm?

a) 2

b) 3

c) 4

d) 5

ANSWERS:

MCQ

1 (a)	**2(a)**	**3(a)**	**4 (d)**	**5(b)**
6 (c)	**7(c)**	**8(c)**	**9 (c)**	**10(c)**
11(c)	**12(b)**	**13.(c)**	**14. (c)**	**15. b**
16. c	**17. d**	**18.c**	**19. a**	**20. b**
21. a	**22. a**	**23. b**	**24. a**	**25. c**

ASSERTION REASON:

26.(b)) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

The correct formula for area of the sector is $\frac{\boldsymbol{\theta}}{\mathbf{360}} \times \boldsymbol{\pi r^2}$

27.(a)) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

Formula given is correct . If R and r be the radius of outer and inner circular path, then area of path is $\pi(R^2 - r^2)$

28.(d) Assertion (A) is false but reason (R) is true

The assertion is wrong as the area calculated is wrong (Area = $\frac{77}{2}cm^2$)

29(a)) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

Circumference= $2 \times \pi \times radius$

176=$2 \times \pi \times radius$

$\frac{176}{2\pi} = radius$

8=$radius$

CASE STUDY 1

30.b 31.d 32.b 33.a 4.c

.CASE STUDY 2

35.b) 200 mm 36.c) 77 mm^2 37. d) 62.86 mm 38. c) 51 π 39.c) 4

TOPIC : PROBABILITY
M.C.Q.

Q.1 In a throw of a pair of dice , the probability of getting a doublet is :

(a) $\frac{1}{3}$ (b) $\frac{1}{6}$ (c) $\frac{5}{12}$ (d) $\frac{2}{3}$

Q.2 Two unbiased dice are thrown . The probability that the total score is more than 5 is

(a) $\frac{1}{8}$ (b) $\frac{5}{18}$ (c) $\frac{7}{18}$ (d) $\frac{13}{18}$

Q.3 If a dice is rolled once , then the probability of obtaining a number greater than 3 is :

(a) $\frac{1}{2}$ (b) $\frac{1}{3}$ (c) 0 (d) $\frac{2}{3}$

Q.4 Which one of the following cannot be the probability of an event ?

(a) $\frac{1}{5}$ (b) 0.3 (c) 4 % (d) $\frac{5}{4}$

Q.5 If two coins are tossed simultaneously, then the probability of getting at least one head is : (a) $\frac{1}{4}$ (b) $\frac{3}{4}$ (c) $\frac{1}{2}$ (d) 1

Q .6 If three coins are tossed simultaneously, then the probability of getting no head is :

(a) $\frac{3}{4}$ (b) $\frac{3}{8}$ (c) $\frac{1}{8}$ (d) $\frac{1}{4}$

Q .7 Which of the following can be the probability of an event?

(a) -0.04 $(b)1.004$ (c) $\frac{18}{23}$ (d) $\frac{8}{7}$

Q.8 In a single throw of a pair of dice , the probability of getting the sum 9 is:

(a) $\frac{1}{18}$ (b) $\frac{1}{9}$ (c) $\frac{1}{6}$ (d) $\frac{2}{9}$

Q .9 The probability of getting an even number , when a die is thrown once is :

(a) $\frac{1}{2}$ (b) $\frac{1}{3}$ (c) $\frac{1}{6}$ (d) $\frac{5}{6}$

Q .10 A box contains 90 discs , numbered from 1 to 90 .if one disc is drawn at random from The box , then the probability that it bears aprime number less than 23 is :

(a) $\frac{7}{90}$ (b) $\frac{10}{90}$ (c) $\frac{4}{45}$ (d) $\frac{9}{89}$

Q.11 The probability of a sure event is :

(a) 2 (b) 1 (c) 0 (d) $\frac{1}{2}$

Q12 If P(E) is 0.75 . what is P(notE)?

(a) 0.35 (b) 0.25 (c)0 (d)1

Q.13 If P(E) is 42% ofan event ,what is the probability of failure of their event?

(a) 8% (b) 1 (c) 0 (d) 58%

Q 14 A bag contains 8 Red and 9 blue marbles , a marble is taken out randomly What is the P(red marble)?

(a) $\frac{8}{9}$ (b) $\frac{8}{17}$ (c) $\frac{9}{17}$ (d) $\frac{16}{17}$

Q 15 In a survey it is found that every fifth person possess a vehicle , what is the probability of a person not possessing the vehicle?

(a) 0 (b) $\frac{1}{5}$ (c) $\frac{4}{5}$ (d) 1

Q 16 . Ashmita and Shreya are sisters, what is the probability that both have birthday on 14^{th} September (ignoring leap year)

(a) $\frac{1}{30}$ (b) $\frac{2}{365}$ (c) $\frac{1}{366}$ (d) $\frac{1}{365}$

Q17 What is the probability of getting a King in a well shuffled pack of 52 cards?

(a) $\frac{1}{13}$ (b) $\frac{1}{52}$ (c) $\frac{1}{26}$ (d) 0

Q .18 The probability of getting a bad egg in lot of 400 is 0.035. The number of bad eggs in

The lot is:

(a) 28 (b) 21 (c) 7 (d) 14

Q 19 The probability expressed as a percentage of a particular occurance can never be

(a) Anything but a whole number (b) greater than 1 (c)Less than 1 (d)Less than 100

Q.20 If the probability of an event is p,then the probability of its complementary event will be :

(a) 1-p (b) p-1 (c) $\frac{1}{p}$ (d)1 - $\frac{1}{p}$

Q 21 If P(E) denotes the probability of an event A, then :

(a) $0 \leq P(E) \leq 1$ (b)$0 \leq P(E) \geq 1$ (c)$-1 \leq P(E) \leq 1$ (d) $P(E) > 1$

CASE STUDY 1:

Rahul and Ravi planned to play Business (board game) in which they were supposed to use two dice.

Q22. Ravi got first chance to roll the dice. What is the probability that he got the sum of the two numbers appearing on the top face of the dice is 8?

a) 1/26
b) 5/36
c) 1/18
d) 0

Q23. Rahul got next chance. What is the probability that he got the sum of the two numbers appearing on the top face of the dice is 13?

a) 1
b) 5/36
c) 1/18
d) 0

Q24. Now it was Ravi's turn. He rolled the dice. What is the probability that he got the sum of the two numbers appearing on the top face of the dice is less than or equal to 12 ?

a) 1
b) 5/36
c) 1/18
d) 0

Q25. Rahul got next chance. What is the probability that he got the sum of the two numbers appearing on the top face of the dice is equal to 7?

a) 5/9
b) 5/36
c) 1/6
d) 0

Q26. Now it was Ravi's turn. He rolled the dice. What is the probability that he got the sum of the two numbers appearing on the top face of the dice is greater than 8?

a) 1

b) 5/36

c) 1/18

d) 5/18

CASE STUDY 2:Question no 27 to 31
On a weekend Rani was playing cards with her family . The deck has 52 cards. If her brother drew one card.

Q27. Find the probability of getting a king of red colour.

a) 1/26

b) 1/13

c) 1/52

d) 1/4

Q28 Find the probability of getting a face card.
a) 1/26
b) 1/13
c) 2/13
d) 3/13
Q29. find the probability of getting a jack of hearts.
a) 1/26
b) 1/52
c) 3/52
d) 3/26
Q 30 . Find the probability of getting a jack of hearts.
a) 1/26
b) 1/52
c) 3/52
d) 3/26
Q 31 . Find the probability of getting a red face card.
a) 3/13

b) 1/13

c) 1/52

d) 1/4

Q32. Find the probability of getting a spade.
a) 1/26

b) 1/13

c) 1/52

d) 1/4

Directions for Q33-Q
In the following questions a statement of assertion(A)is followed by a statement of reason (R) mark the correct choice as :

A) both assertion(A) and reason(R)are true and reason is the correct explanation of Assertion(A)

B)both assertion and reason are true but reason is not the correct explanation of assertion(A)

C)assertion is true but reason is false

D)assertion is false but reason is true

Q33 Assertion: the probability of getting a prime number when a dice is thrown once is 2/3

Reason: prime number on a dice are 2,3,5

(a) A (b) B (c) C (d) D

Q34 Assertion: card numbered as 1,2,3.....15 in a box and mixed thoroughly one card is then drawn at random.The probability of drawing an even number is 1/2

Reason: for any event we have 0<=P(E)<=1

(a) A (b) B (c) C (d) D

Q35 Assertion: An event is very unlikely to happen. Its probability is 0.0001
Reason: If P(A) denotes the probability of an event A, then 0<=P(A)<=1
(a) A (b) B (c) C (d) D

Q36 Assertion: when two coins are tossed simultaneously then the probability of getting no tail is 1/4

Reason: The probability of getting a head (i.e. no tail)in one toss of a coin is ½

(a) A (b) B (c) C (d) D

Q37 Assertion: If a box contains 5 white ,2 Red ,and 4 Black marbles then the probability of not drawing a white marble from the box is 5/11

Reason : P(E) = 1- P(E),where E is any event

(a) A (b) B (c) C (d) D

Q.38 Assertion: In a simultaneous throw of a pair of dice the probability of getting a doublet is 1/6.

Reason: Probability of an event may be negative.

(a) A (b) B (c) C (d) D

Q 39 Assertion: When two coins are tossed simultaneously, then the probability of getting no tail is ¼

Reason: The probability of getting a head in one toss of a coin is ½

(a) A (b) B (c) C (d) D

Q 40 Assertion: In rolling a dice the probability of getting number 8 is zero

Reason; It is an impossible event

(a) A (b) B (c) C (d) D

ANSWER KEY

1. b
2. d
3. a
4. d
5. b
6. c
7. c
8. b
9. a
10. c
11. b
12. b
13. d
14. b
15. c
16. d
17. a
18. d
19. c
20. a
21. a
22. b
23. d
24. a
25. c
26. d
27. a
28. d
29. b
30. a
31. d
32. d
33. d
34. d
35. b
36. a
37. d
38. a
39. a
40. a