



B.KUMAR'S ACADEMY

Subject : Math - I

QUESTION PAPER

Total Marks : 20

Class : X (SSC)

1. Linear Equations in Two variables

Time : 1 Hour.

Q. 1 A) Choose the correct alternatives of the following questions.

2

1) The index of variable in linear equation is always -----.

- a) Zero b) Two c) One d) Not define

2) If $\begin{vmatrix} a & b \\ c & d \end{vmatrix}$ then value of determinant is.

- a) 1 b) ad-bc c) ab - bc d) ac - bd

Q. 1 B) Write any 2 linear equations in two variables.

1

Q. 2 A) Attempt any one.

2

1) Find the value of determinant

$$\begin{aligned} A &= \begin{vmatrix} 2\sqrt{3} & 3 \\ 2 & 3\sqrt{3} \end{vmatrix} \\ &= [2\sqrt{3} \times \boxed{}] - [2 \times 3] \\ &= [6 \times \sqrt{3} \times 3] - [6] \\ &= [6 \times \boxed{}] - [6] \\ &= \boxed{} - 6 = \boxed{} \end{aligned}$$

2) For simultaneous equation in variables x and y, $D_x = 49$; $D_y = -63$ and $D=7$ then find x and y.

→ For simultaneous equations in variable x and y, $D_x = \boxed{}$, $D_y = \boxed{}$ and $D = \boxed{}$

∴ By cramer's rule.

$$x = \frac{D_x}{D} = \frac{\boxed{}}{\boxed{}} = 7, \quad y = \frac{D_y}{D} = -9$$

∴ x = 7 and y = - 9.

Q. 2 : B) Attempt any one.

2

1) Solve the simultaneous equations

$$3a + 5b = 26; \quad a + 5b = 22.$$

2) Solve simultaneous equation by cramer's rule.

$$3x - 4y = 10; \quad 4x + 3y = 5.$$

Q. 3 A) Solve Any one.

3

1) Complete the following tables.

I) $x + y = 3$

x	3		
y		5	3
(x, y)	(3, 0)		(0, 3)

II) $x - y = 4$

x		-1	0
y	0		-4
(x, y)			(0, -4)

2) Complete the following activity to solve simultaneous equations.

$$5x + 3y = 9 \quad \text{----- I}$$

$$2x - 3y = 12 \quad \text{----- II}$$

Let's add equation (I) and (II)

$$\begin{array}{r} 5x + 3y = 9 \\ + 2x - 3y = 12 \\ \hline \end{array}$$

$$\boxed{}x = \boxed{}$$

$$x = \frac{\boxed{}}{\boxed{}}$$

$$x = \boxed{}$$

put $x = 3$ in eqⁿ (I)

$$5 \times \boxed{} + 3y = 9$$

$$3y = 9 - \boxed{}$$

$$3y = \boxed{}$$

$$y = \frac{\boxed{}}{3}$$

$$y = \boxed{}$$

$\therefore$ solution is

$$(x, y) = (\boxed{}, \boxed{})$$

Q.3 : B) Solve any one.

3

1) The sum of two numbers is 60. The greater number is 8 more than thrice the smaller number. Then Find the numbers.

2) Solve the following by cramer's rule

$$4x + 3y - 4 = 0; \quad 6x = 8 - 5y$$

Q. 4 : Solve Any one.

4

$$1) \frac{27}{x-2} + \frac{31}{y+3} = 85; \quad \frac{31}{x-2} + \frac{27}{y+3} = 89$$

2) The perimeter of a rectangle is 40cm. The length of rectangle is more than double it's breadth by 2. Find length and breadth.

Q. 5 : Attempt any one of the following.

3

1) Solve the following simultaneous equation $99x + 101y = 499$. $101x + 99y = 501$

2) Solve the simultaneous equation graphically.

$$x + y = 0 \quad 2x - y = 9.$$





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2. Quadratic Equations

Time : 1 Hour.

Q. 1 : A) Choose the correct alternatives of the following. **2**

1) General form of the quadratic equation is.

- a) $ax + by + c$ b) $ax^2 + by + c$ c) $ax^2 + bx + c = 0$ d) None of the above

2) In a quadratic Equation if $b^2 - 4ac < 0$ then roots are

- a) Equal b) Not real c) real and equal d) real and unequal

B) Write the following equation in its standard form. **1**

i) $2y = 10 - y^2$

Q. 2 : A) Solve any one. **2**

1) Find the value of discriminant $\sqrt{2}x^2 + 4x + 2\sqrt{2} = 0$

$$\rightarrow \sqrt{2}x^2 + 4x + 2\sqrt{2} = 0$$

comparing with $ax^2 + bx + c = 0$

we get $a = \square$, $b = \square$, $c = \square$

$$\Delta = \square$$

$$= (4)^2 - 4\sqrt{2} \times 2\sqrt{2}$$

$$= 16 - 16$$

$$= 0$$

2) Solve by formula method

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

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

Comparing with $ax^2 + bx + c = 0$

$$\therefore a = 1, b = 6, c = 5$$

$$\therefore x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$= \frac{-6 \pm \sqrt{(\square)^2 - \square \times \square \times 5}}{2 \times 1}$$

$$= \frac{-6 \pm \sqrt{36 - 20}}{2} = \frac{-6 \pm \sqrt{\square}}{2} = \frac{-6 \pm 4}{2} = \frac{\cancel{2}(-3 \pm 2)}{\cancel{2}}$$

$$x = -3 \pm 2 = -3 + 2 = -1 \text{ Or } x = -3 - 2 = -5$$

$$\therefore x = \square \text{ or } x = \square$$

Q. 2 : B) Solve any one.

2

- 1) Write the following quadratic equation in standard form.

$$3m^2 = 2m^2 - 9$$

$$x^2 - 9 = 13.$$

- 2) Factorise $m^2 - 14m + 13 = 0$.

Q. 3 : A) Solve Any one.

3

- 1) Form the quadratic equation from the roots given below

$$2 - \sqrt{5}, 2 + \sqrt{5}$$

$$\text{Consider } \alpha = 2 - \sqrt{5}$$

$$\beta = 2 + \sqrt{5}$$

But we know that,

$$x^2 - (\square)x + \square = 0 \quad (1)$$

$$\therefore \alpha + \beta = (2 - \sqrt{5}) + (2 + \sqrt{5})$$

$$= 2 - \cancel{\sqrt{5}} + 2 + \cancel{\sqrt{5}}$$

$$= 2 + 2 = 4$$

$$\therefore \alpha + \beta = 4$$

$$= \alpha \times \beta = (\square) \times (\square)$$

$$= (2)^2 - (\cancel{\sqrt{5}})^2$$

$$= 4 - 5 = -1$$

$$\therefore \alpha \times \beta = -1$$

$\therefore$ Put the values of $\alpha + \beta$ and $\alpha \times \beta$ in eqⁿ (1)

$$\therefore x^2 - (\alpha + \beta)x + \alpha\beta = 0$$

$$x^2 - \square - 1 = 0$$

$\therefore$ Required quadratic eqⁿ is

$$x^2 - \square - 1 = 0$$

- 2) If α and β are roots of $y^2 - 2y - 7 = 0$ then find.

1) $\alpha^2 + \beta^2$

2) $\alpha^3 + \beta^3$

$$\rightarrow y^2 - 2y - 7 = 0$$

comparing with $ax^2 + bx + c = 0$

$$a = \boxed{}, b = \boxed{}, c = \boxed{}$$

$$\therefore \alpha + \beta = \frac{\boxed{}}{\boxed{}} = 2$$

$$\alpha \times \beta = \frac{\boxed{}}{\boxed{}} = -7$$

$$\begin{aligned} 1) \quad \alpha^2 + \beta^2 &= \boxed{} - 2\alpha\beta \\ &= (2)^2 - 2 \times (-7) \\ &= 4 + 14 \\ &= 18 \end{aligned}$$

$$\begin{aligned} 2) \quad \alpha^3 + \beta^3 &= \boxed{} - 3\alpha\beta(\alpha + \beta) \\ &= (2)^3 - 3(-7)(2) \\ &= 8 + 42 \\ &= 50. \end{aligned}$$

Q. 3 : B) Solve Any one.

3

- 1) The sum of the squares of two consecutive even natural numbers is 100 then find the numbers.
- 2) Solve quadratic equation by using formula method
 $m^2 - 14m + 13 = 0$

Q. 4 : Attempt any one of the following.

4

- 1) Solve by completing square method
 $5x^2 - 4x - 3 = 0$
- 2) A natural number is greater than three times its square root by 4. Find the number.

Q. 5 : Solve Any one

3

- 1) The difference between the roots of equation $x^2 - 13x + k = 0$ is 7. Find k.
- 2) Solve by factorisation method.

$$6\sqrt{3}x^2 + 7x = \sqrt{3}$$



B.KUMAR'S ACADEMY

Subject : Math - I
Class : X

Question Paper 3. Arithmetic Progression

Total Marks : 20
Time : 1 Hour

Q. 1 A) Choose the correct alternatives of the following questions.

2

- 1) In an A. P. the common difference denoted by 'd' is.....
a) Positive b) Negative c) Zero d) All the above.
- 2) The fifth term of an A. P. is

$$\frac{1}{2}, \frac{1}{6}, \frac{1}{18}, \frac{1}{54}, \dots$$

- a) $\frac{1}{160}$ b) $\frac{1}{162}$ c) $\frac{1}{165}$ d) $\frac{1}{166}$

B) Define sequence with example.

1

Q. 2 : A) Attempt any ONE of the following.

2

- 1) Write whether the following sequences is in A. P. ? If it is in A. P. find the common difference. 2, 4, 6, 8, -----

Given Sequence is,

2, 4, 6, 8, -----

$$\therefore t_1 = 2, t_2 = 4, t_3 = \boxed{}, t_4 = 8$$

$$\therefore t_2 - t_1 = 4 - \boxed{} = 2$$

$$t_3 - t_2 = 6 - 4 = \boxed{}$$

$$t_4 - t_3 = \boxed{} - 6 = 2$$

$\therefore$ By definition of A. P. the difference between two consecutive terms is common i.e. 2

$\therefore$ The given sequence is A. P. and common difference is 2.

- 2) Which term of the following A. P. is 560? 2, 11, 20, 29, -----

Given AP is

2, 11, 20, 29,

$\therefore$ n^{th} term of this A.P. is 560

$$t_n = a + (n - 1) \times d$$

$$\boxed{} = 2 + (n - 1) \times \boxed{}$$

$$\therefore 560 = 2 + 9n - 9$$

$$\therefore 560 = 2 - 9 + 9n$$

$$\therefore 560 = -7 + 9n$$

$$\therefore 567 = 9n$$

$$\therefore n = \frac{567}{9}$$

$$\therefore n = \boxed{}$$

$$\therefore 63^{\text{rd}} \text{ term of A.P. is } \boxed{}$$

Q. 2 B) Attempt any ONE of the following.

2

- 1) The first term 'a' and common difference 'd' are given. Find first four terms of A.P.

$$a = -3, d = 4.$$

- 2) Find t_n for following A.P.

$$3, 8, 13, 18, \dots$$

Q. 3 : A) Attempt any ONE of the following.

3

- 1) Find the sum of the first 'n' odd natural numbers. Hence find $1 + 3 + 5 + \dots + 101$.

→ 1, 3, 5 ----- are the odd natural numbers

$$\therefore t_1 = a = 1, d = \boxed{};$$

$$\therefore S_n = \frac{n}{\boxed{}} \left[\boxed{} + (n-1) \times d \right]$$

$$= \frac{n}{2} [2 \times 1 + (n-1) \times 2]$$

$$= \frac{n}{2} [2 + (n-1) \times 2]$$

$$= \frac{n}{2} [\cancel{2} + 2n - \cancel{2}]$$

$$= \frac{n}{\cancel{2}} \times \cancel{2}n$$

$$\therefore S_n = n \times n = n^2 \text{ _____ (1)}$$

Now,

$$\therefore t_n = a + (n-1) \times d$$

$$\boxed{} = 1 + (n-1) \times 2$$

$$101 = 1 + 2n - \boxed{}$$

$$101 = 1 - 2 + 2n$$

$$101 = -1 + 2n$$

$$101 + 1 = 2n$$

$$\boxed{} = 2n$$

$$\frac{102}{2} = n$$

$$\therefore n = 51$$

$$\therefore \text{From eq}^n(1)$$

$$S_n = n^2$$

$$\therefore S_{51} = (51)^2 = 2601$$

$$\therefore \text{The sum of the first } n \text{ odd natural numbers is } n^2 ; S_{51} = 2601$$

2) Sum of first 55 terms in an A. P. is 3300, Find it's 28th term.

$$S_n = S_{55} = 3300$$

$$\therefore S_n = \frac{n}{2} [2a + (n - 1) \times d]$$

$$= \frac{\boxed{}}{2} [2a + \boxed{} \times d]$$

$$= \frac{55}{2} [2a + 54d]$$

$$\therefore S_{55} = \frac{55}{2} [2a + 54d]$$

$$\therefore \boxed{} = \frac{55}{2} \times 2[a + 27d]$$

$$\therefore 3300 = 55 (a + 27d)$$

$$\therefore a + 27d = \boxed{} \quad \text{B.K.'S ACADEMY} \quad (1)$$

$$\therefore \text{We have to find } t_{28}$$

$$t_n = a + (n - 1) \times d$$

$$\therefore t_{28} = a + (28 - 1) \times d$$

$$t_{28} = a + 27d$$

$$\text{From eq}^n(1)$$

$$\therefore a + 27d = \boxed{}$$

$$\therefore t_{28} = \boxed{}$$

$$\therefore \text{The 28}^{\text{th}} \text{ term is 60}$$

Q. 3 B) Attempt any ONE of the following.

3

1) The taxi fare is ₹ 14 for the first kilometer and ₹ 2 for each additional kilometer.

What will be the fare for 10 kilometers?

- 2) Check whether 301 is in sequence.
5, 11, 17, 23, ?

Q. 4 : Attempt any ONE of the following.

4

- 1) Find four consecutive terms in an A. P. whose sum is 12 and sum of 3rd and 4th term is 14.
- 2) The 10th term and 18th term of an A. P. are 25 and 41 respectively then find 38th term of that A. P. similarly if nth term is 99. Find the value of n.

Q. 5 : Attempt any ONE of the following.

3

- 1) How many three digit Natural numbers are divisible by four?
- 2) Find three consecutive terms in an A. P. whose sum is -3 and the product of their cubes is 512.





B.KUMAR'S ACADEMY

Subject : Math - I

Question Paper

Total Marks : 20

Class : X

4. Financial Planning

Time : 1 Hour

Q.1 A) Choose the correct alternatives of the following questions.

2

- 1) GST is in effect from
a) July 2017 b) July 2018 c) Jan 2017 d) June 2018
- 2) In which rate of GST the good i.e. CCTV comes.....
a) 0% b) 12% c) 18% d) 28%

B) Write any two benefits of mutual funds.

1

Q.2 A) Attempt any ONE of the following.

2

- 1) Arati gas agency supplied LPG cylinder to consumer for taxable value of ₹ 545. GST charged is 5%. What is amount off CGST and SGST in th tax invoice? What is total amount paid by consumer? Find the amount of GST to be paid by Arati Gas Agency.

Rate of GST = 5%

Rate of CGST = 2.5% and

Rate of SGST = 2.5%

$$\text{CGST} = \frac{2.5}{100} \times 545 = ₹ \boxed{}$$

$$\therefore \text{SGST} = \text{CGST} = ₹ \boxed{}$$

Amount paid by consumer =

$$\text{Taxable value} + \boxed{} + \boxed{}$$

$$= 545 + 13.63 + 13.63 = 572.26$$

Arati Gas Agency has to pay CGST = ₹ 13.63 and SGST = ₹ 13.63

$$\therefore \text{Total GST to be paid} = 13.63 \times 2 = ₹ 27.26$$

- 2) M/s. Jay chemicals purchase a liquid soap having taxable value ₹8000 and sold it to the consumers for taxable value ₹ 10,000. Rate of GST is 18%. Find CGST and SGST payable by M/s. Jay chemicals.

Input tax = 18% of 8000

$$= \frac{\boxed{}}{100} \times 8000$$

$$= ₹ \boxed{}$$

Output tax = 18% of 10,000

$$= \frac{18}{100} \times \boxed{}$$

$$= ₹ 1800$$

∴ GST payable = output tax – ITC

$$= \boxed{} - 1440$$

$$= ₹ 360$$

∴ Payable CGST = ₹ 180 and payable.

SGST = ₹ 180 by M/S Jay chemicals.

Q. 2 B) Attempt any ONE of the following.

2

- 1) Write any four zero rated services for GST.
- 2) 'Pawan medical' supplies medicines on some medicines the rate of GST is 12% then what is the rate of CGST and SGST?

Q. 3 A) Attempt any ONE of the following.

3

- 1) Prashant bought 50 shares of FV ₹ 100, having MV ₹ 180. Company gave 40% dividend on the shares. Find the rate of return on investment.

Here, Number of shares = 50, FV = ₹ 100,

$$MV = ₹ \boxed{}, \text{ rate of dividend} = 40\%$$

∴ Sum invested = Number of shares × MV

$$= 50 \times 180$$

$$= ₹ \boxed{}$$

Dividend per share = 40% of FV

$$= \frac{40}{100} \times 100$$

$$\text{Dividend} = ₹ 40$$

∴ Total dividend on 50 shares = $\boxed{} \times 40$

$$= ₹ 2000$$

Now, rate of return

$$= \frac{\text{Total dividend}}{\text{Sum invested}} \times 100$$

$$= \frac{\boxed{}}{9000} \times 100$$

$$= \boxed{} \%$$

∴ Rate of return on investment is 22.2%.

- 2) If 50 shares of FV ₹ 10 were purchased for MV of ₹ 25 company declared 30% dividend on the shares then find.

(1) Sum investment (2) Dividend received (3) Rate of Return

FV = ₹10, MV = ₹24

No. of shares = 50

1) ∴ sum investment = $\boxed{} \times \boxed{} = ₹1200$

2) Dividend per share = $10 \times \frac{\boxed{}}{100} = ₹3$

∴ Total dividend = $50 \times 3 = ₹150$

3) Rate of return = $\frac{\text{Divided income}}{\text{sum invested}} \times 100$
 $= \frac{150}{1200} \times 100 = 12.5\%$

Q. 3 B) Attempt any ONE of the following.

3

- 1) Explain comparison of Face value (FV) and market value (MV) with example
- 2) Pankajrao invested ₹ 1,25,250 in shares of FV ₹ 10 when MV is ₹ 125. Rate of brokerage is 0.2% and GST is 18%. Then find
 - (1) How many shares were purchased?
 - (2) Amount of brokerage paid and
 - (3) GST paid for the trading.

Q. 4 : Attempt any ONE of the following.

4

- 1) Neel has invested in shares as follows. Find his total investment
 company A : 350 shares. FV = ₹ 10, premium = ₹ 7
 company B : 2750 shares. FV = ₹ 5, Discount = ₹ 1
 company C : 50 shares. FV = ₹ 100, MV = ₹ 150
- 2) M/s. Jay chemicals purchased a liquid soap for ₹ 8000 (with GST) and sold it to the consumers for ₹ 10,000 (with GST). Rate of GST is 18% Find the amount of CGST and SGST to be paid by Jay chemicals.

Q. 5 : Attempt any ONE of the following.

3

- 1) Nalinitai invested ₹ 6024 in the shares of FV ₹ 10 when the market value was ₹ 60 she sold all the shares at MV of ₹ 50 after taking 60% dividend. She paid 0.4% brokerage at each stage of transactions. what was the total gain or loss in this transaction?

- 2) Shri. Batliwala sold shares of ₹ 30,350 and purchased shares of ₹ 69,650 in a day. He paid brokerage at the rate of 0.1% on sale and purchase. 18% GST was charged on brokerage. Find his total expenditure on brokerage and tax.





B.KUMAR'S ACADEMY

Subject : Math - I

Class : X

Question Paper

5. Probability

Total Marks : 20

Time : 1 Hour

Q.1 : A) Choose the correct alternatives of the following questions.

2

1) Result of a random experiment is known as.

- a) Probability b) Outcome
c) Event d) None of the above.

2) In a pack of 52 playing cards total face cards are

- a) 10 b) 11
c) 13 d) 12

B) Define sample space with suitable example.

1

Q.2 : A) Attempt any ONE of the following.

2

1) There are 15 tickets in a box, each bearing one of the numbers from 1 to 15. One ticket is drawn at random from the box. Find the probability of event that the ticket drawn.

- i) Shows an even number. ii) Shows a number which is a multiple of 5.

→ Let 'S' is the sample space. 15 tickets in a box

$$\therefore n(S) = 15$$

Event A: Ticket drawn shows an even number

$$n(A) = \{2, 4, 6, 8, 10, 12, 14\}$$

$$n(A) = 7$$

$$P(A) = \frac{\boxed{}}{n(S)}$$

$$= \frac{7}{15}$$

$$P(A) = \frac{7}{15}$$

Event B : Ticket drawn shows a number which is a multiple of 5

$$n(B) = \{ \boxed{}, 10, \boxed{} \}$$

$$n(B) = \boxed{}$$

$$P(B) = \frac{n(B)}{n(S)}$$

$$= \frac{3}{15}$$

$$= \frac{1}{5}$$

- 2) Two coins are tossed simultaneously write the sample space (s) and number of sample (p) and n(s). Also write it in set form the condition that getting no head.

→ Two coins are tossed.

$$S = \boxed{}$$

$$\therefore n(S) = 4$$

$\therefore$ By given condition

we have no head outcome

$$\therefore A = \boxed{}$$

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

: B) Attempt any ONE of the following.

2

- 1) How many possibilities are there in each of the following.

- i) Any day of a week is to be selected.
- ii) Select one card from the pack of 52 cards.

- 2) **One die is rolled then find the probability of each of following events.**

- i) No. on upper face is prime
- ii) No. on upper face is even

Q.3 : A) Attempt any ONE of the following.

3

- 1) Write sample space 's' and number of sample point n(s) for the following experiment. Also write events A, B, C in the set form and write n(A), n(B) and n(C).

One die is rolled.

Event A : Even number on the upper face

Event B : Odd number on the upper face

Event C : Number greater than 4

→ One die is rolled.

$$S = \{1, 2, 3, \boxed{}, 5, 6\}; n(s) = 6$$

Event A : Even number on the upper face

$$A = \{2, \square, 6\}$$

$$\therefore n(A) = \square$$

Event B : odd number on the upper face

$$B = \{1, \square, 5\}$$

$$\therefore n(\square) = 3$$

Event C : Number greater than 4

$$C = \{\square, 6\}$$

$$\therefore n(C) = 2$$

- 2) Find the probability of the following when a coin is tossed.

i) Getting head ii) getting tail

Space space

$$S = \{H, T\}$$

$$\therefore n(S) = \square$$

- i) Let A be event of getting head.

$$A = \square$$

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

$$\therefore P(A) = \frac{\square}{\square} = \frac{1}{2}$$

- ii) Let B be event of getting tail.

$$B = \square$$

$$\therefore n(B) = 1$$

$$\therefore P(B) = \frac{\square}{n(S)} = \frac{1}{2}$$

: B) Attempt any ONE of the following.

3

- 1) Two digit numbers are formed using digits, 0,1, 2, 3, 4, 5 without repetition of the digits.

Event A : The number formed is even.

Event B : The number formed is divisible by 3

Event C : The number formed is greater than 50. Write $n(A)$, $n(B)$ and $n(c)$.

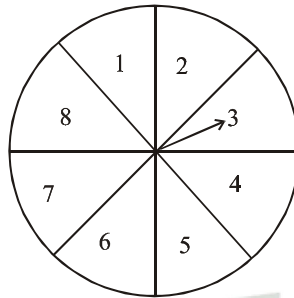
- 2) A card is drawn from a well shuffled pack of 52 playing cards. Find the probability of each event. The card drawn is

i) A red card ii) A face card.

Q. 4 : Attempt any ONE of the following.

4

- 1) A card is drawn from a well shuffled pack of 52 playing cards. Find the probability of each event. The card drawn is.
 - i) A red card
 - ii) a face card
 - iii) A diamond card
 - iv) A spade card.
- 2) A game of a chance, a spinning arrow comes to rest at one of the numbers 1, 2, 3, 4, 5, 6, 7, 8. All these are equally likely outcomes find the probability that it will rest at.
 - i) 8
 - ii) An odd number
 - iii) A number greater than 2
 - iv) A number less than 9



Q. 5 : Attempt any ONE of the following.

3

- 1) If a card is drawn from a pack of 52 cards. Find the probability of the following events.
 - i) Event A : Getting a black card.
 - ii) Event B : Not getting a black card
 - iii) Events C : Getting a card bearing number between 2 to 5 including 2 and 5.
- 2) A sanitation committee of two members is to be formed from 3 boys and 2 girls. Write sample space 's' and number of sample pts n(s). Also find the probability that.
 - i) At least one girl must be member of the committee.
 - ii) Committee must be of one boy and one girl.
 - iii) Committee must be of boys only.

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B.KUMAR'S ACADEMY



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Subject : Math - I
Class : X

Question Paper 6. Statistics

Total Marks : 20
Time : 1 Hour

Q.1 : A) Choose the correct alternative of the following questions.

2

1) If the numbers in data are arranged in ascending order, the number at the middle position is called as.

- a) Mode b) Frequency c) Median d) Mean

2) An experiment can have.

- a) One out come b) Many out come
c) Zero out come d) None of the above

: B) If the given values are

1

c. f. 22, L = 30 f = 18, h = 10, N = 70 then find median

Q.2 : A) Attempt any ONE of the following.

2

1) The following table shows the number of students and the time they utilized daily time spent by students for their studies by direct method.

Time (hrs)	0-2	2-4	4-6	6-8	8-10
No. of Students	7	18	12	10	3

→

Time (hrs.)	Class Marks	Frequency	Class mark x Frequency x_i / f_i
0-2	1	7	$\square = 7$
2-4	3	18	$3 \times 18 = 54$
4-6	5	12	$5 \times 12 = \square$
6-8	7	10	$7 \times 10 = \square$
8-10	9	3	$3 \times 9 = \square$
		$N = \sum f_i = 50$	$\sum x_i f_i = 218$

$$\text{Mean } \bar{x} = \frac{\sum f_i x_i}{\sum f_i} = \frac{218}{50} = 4.36 \text{ hrs.}$$

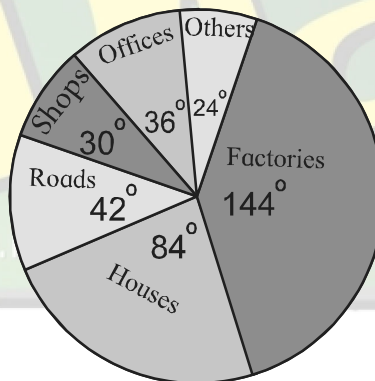
2) The following table shows the daily supply of electricity to different place in a town show the information by a pie diagram.

Places	Factories	Houses	Roads	Shops	offices	Other
Supply of electricity	24	14	7	5	6	4

→

Supply of electricity	Unit	Measure of central angle
Factories	24	$\frac{24}{60} \times 360 = 144^\circ$
Houses	14	$\frac{14}{60} \times 360 = 84^\circ$
Roads	7	$\frac{7}{60} \times 360 = 42^\circ$
Shops	5	$\frac{5}{60} \times 360 = 30^\circ$
Offices	6	$\frac{6}{60} \times 360 = 36^\circ$
Others	4	$\frac{4}{60} \times 360 = 24^\circ$

∴ The pie diagram



B) : Attempt any ONE of the following.

2

1) The percentage of marks of 50 students in a test is given in following table.

Percentage of marks	0-20	20-40	40-60	60-80	80-100
No. of students	3	7	15	20	5

Find the mean of the percentage.

2) The maximum temperature in °C of 30 towns in the last summer, is shown in the following table.

Max. temp.	24-28	28-32	32-36	36-40	40-44
No. of towns	4	5	7	8	6

Find mean of the maximum temperatures.

Q.3 : A) Attempt any ONE of the following.

3

1) Grouped frequency distribution of supply of milk to hotels and the no. of hotels is given in the following table. Find the mode of the supply of milk.

Milk (Litre)	1-3	3-5	5-7	7-9	9-11	11-13
No. of Hotels	7	5	15	20	35	18

→

Class	Frequency
1-3	7
3-5	5
5-7	15
7-9	20 f_0
9-11 Modal class	35 f_1
11-13	18 f_2

∴ Modal class is 9-11.

∴ $f_1 = 35$, $f_0 = 20$, $f_2 = 18$

$L = 9$, $h = 2$

$$\text{Mode} = L + \frac{f_1 - f_0}{f_1 - f_0 + f_1 - f_2} \times h$$

$$= 9 + \left[\frac{35 - 20}{2 \times 35 - 20 - 18} \right] \times 2$$

$$= 9 + \left[\frac{15}{52} \right] \times 2$$

$$= 9 + \frac{30}{52}$$

$$= 9 + \frac{15}{26}$$

Mode = 9.94 litre.

2) The following table shows ages of 300 patients getting medical treatment in a hospital on particular day.

Age (in years)	10-20	20-30	30-40	40-50	50-60	60-70
Number of patients	60	42	55	70	53	20

Find the median age of the patient.

→ Age (in yrs)	Number of Patients	C.F. (Less than type)
10 – 20		60
20 – 30	42	$60 + \text{} = 102$
30 – 40	55 <i>f</i>	$102 + 55 = 157$ c.f.
Median class		
40 - 50	70	$157 + 70 = 227$
50 – 60	53	$\text{} + 53 = 280$
60 – 70	20	$280 + 20 = 300$

$$N = 300, \frac{N}{2} = 150$$

C. F. which is just greater than 150, 157 i.e.

∴ 30 - 40 is the median class.

$$L = 30, f = 55 \text{ c. f.} = 102 \text{ h} = 10$$

$$\therefore \text{Median} = L + \left[\frac{\frac{N}{2} - \text{c.f.}}{f} \right] \times \text{}$$

$$= 30 + \left[\frac{\text{} - 102}{55} \right] \times 10$$

$$= 30 + \left[\frac{48}{\text{}} \right] \times 10$$

$$= 30 + \frac{480}{55}$$

$$= 30 + 8.73$$

$$\text{Median} = 38.73 \text{ yrs.}$$

∴ Median age of patient is 38.73 yrs

: B) Attempt any ONE of the following.

3

1) Draw the histogram to represent the following data.

Daily Sales of a Store (in ₹)	0-1000	1000-2000	2000-3000	3000-4000	4000-5000
No. of days in month	2	12	10	4	2

2) The following table shows frequency table of daily wages of 50 workers in trading company. Find the mean wages of a worker, by assumed mean method.

Daily wages	200-240	240-280	280-320	320-360	360-400
Frequency	5	10	15	12	8

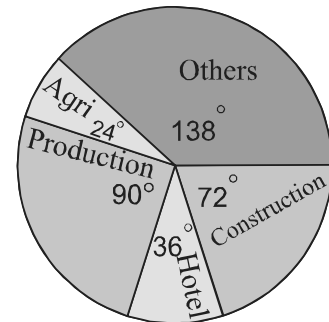
Q. 4 : Attempt any ONE of the following.

4

1) As deduced from a survey, the classification of skilled workers is shown in the pie diagram.

If the no. of workers in the production sector is 4500 answer the following questions.

- What is the total number of skilled workers in all fields?
- What is the number of skilled workers in the field of constructions?
- How many skilled workers are in agriculture?
- Find the difference between the numbers of workers in the field of production and construction.



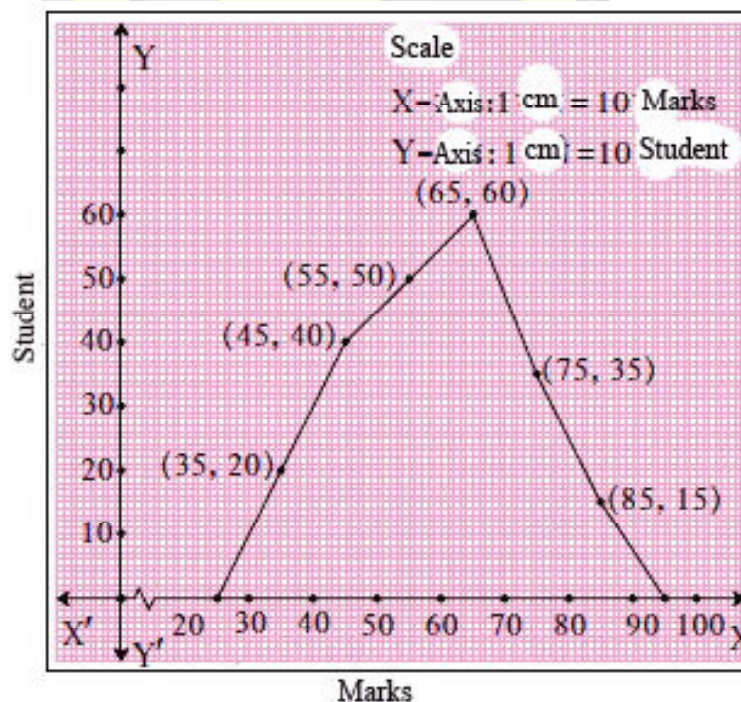
2) Draw a pie diagram to represent the world population of countries given in the following table after determining the value of a.

Country	India	China	Russia	USA	Others	Total
Percentage	15	20	a	a	25	100

Q. 5 : Attempt any ONE of the following.

3

1) Observe the following frequency polygon and write the answers of the questions below it.



- i) Which class has the maximum number of students?
- ii) Write the classes having zero frequency.
- iii) What is the class mark of the class having frequency of 50 students ?

2) Represent the following data using histogram and hence draw frequency polygon.

No. of words. typed per minute	30-39	40-49	50-59	60-69	70-79
No. of typists	2	8	15	12	3

* * *





B.KUMAR'S ACADEMY

Subject : Math - II

QUESTION PAPER

Total Marks : 20

Class : X

1. Similarity

Time : 1 Hour.

Q. 1 : A) Choose the correct alternative of the following questions.

2

1) If a line divides any two sides of a triangle in the same ratio, then the line is

- a) Equal to third side b) parallel to third side
c) half of the third side d) None of these.

2) Areas of triangles with equal heights are proportional to

- a) Their corresponding bases.
b) Their corresponding Angles.
c) Their corresponding heights.
d) None of the above.

Q. 1 : B) 1) If $\triangle ABC \sim \triangle PQR$ and $AB:PQ=2:3$ then find $\frac{A(\triangle ABC)}{A(\triangle PQR)}$.

1

Q. 2 : A) Solve any One.

2

1) $\triangle ABC \sim \triangle PQR$, $A(\triangle ABC)=16$;

$A(\triangle PQR)=25$ then find $\frac{AB}{PQ}$

→ Given that

$$\triangle ABC \sim \triangle PQR$$

∴ By theorem of areas of similar triangle

$$\frac{A(\triangle ABC)}{A(\triangle PQR)} = \frac{\boxed{}}{\boxed{}}$$

$$\frac{16}{25} = \frac{\boxed{}}{\boxed{}}$$

By taking square root of both sides,

$$\therefore \frac{AB}{PQ} = \frac{\boxed{}}{\boxed{}}$$

2) In trapezium ABCD, side $AB \parallel$ side $PQ \parallel$ side DC

$AP=15$, $PD=12$, $QC=14$ find

BQ .

→ Side $AB \parallel$ side $PQ \parallel$ side DC

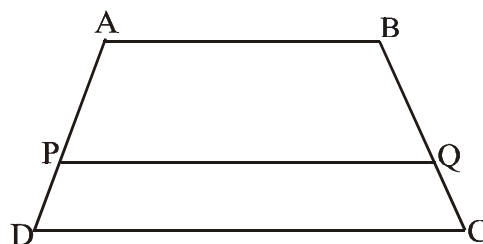
∴ By property of three parallel lines and their transversals.

$$\therefore \frac{AP}{PD} = \frac{\boxed{}}{\boxed{}}$$

$$\therefore \frac{15}{12} = \frac{BQ}{\boxed{}}$$

$$\therefore BQ = \frac{\cancel{15}^5 \times 14}{\cancel{12}_4} = \frac{14 \times 5}{4} = \frac{70}{4}$$

$$= \boxed{} \text{ units.}$$

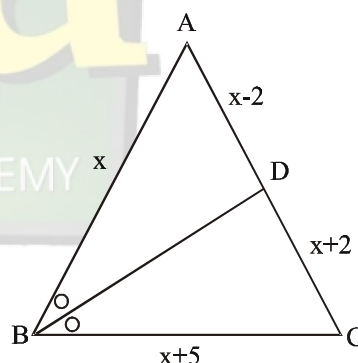
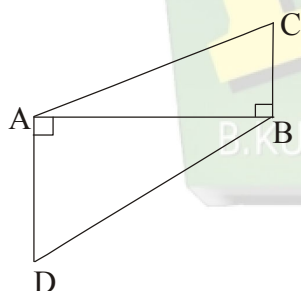


Q. 2 : B) Solve Any One.

2

1) In $\triangle ABC$ point D on side BC is such that $DC = 6$, $BC = 15$. Find $A(\triangle ABD) : A(\triangle ABC)$ and $A(\triangle ABD) : A(\triangle ADC)$.

2) In fig. $BC \perp AB$, $AD \perp AB$, $BC = 4$, $AD = 8$ then find $\frac{A(\triangle ABC)}{A(\triangle ADB)}$



Q. 3 : A) Solve Any one.

3

1) In $\triangle ABC$, seg BD bisects

$\angle ABC$ If $AB = x$, $BC = x + 5$

$AD = x - 2$, $DC = x + 2$ then

find the value of x

→ seg BD bisects $\angle ABC$

$$AB = \boxed{}, \quad BC = \boxed{}$$

$$AD = \boxed{}, \quad DC = \boxed{}$$

∴ By Angle bisector property

$$\therefore \frac{\boxed{}}{\boxed{}} = \frac{\boxed{}}{\boxed{}}$$

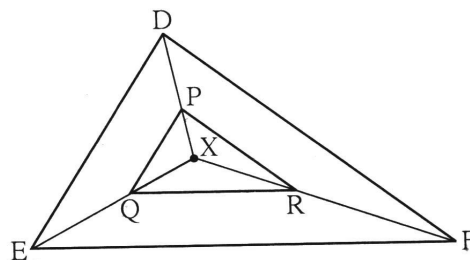
$$\frac{x}{x+5} = \frac{x-2}{x+2}$$

$$= x(x+2) = (x+5)(x-2)$$

$$x^2 + 3x - 10 = x^2 + 2x$$

$$\therefore x = \boxed{}.$$

2) In the figure X is any point in the interior of triangle. Point X is joined to vertices of triangle. Seg PQ || seg DE, seg QR || seg EF. Fill in the blanks to prove that, seg PR || seg DF.



In $\triangle XDE$, $PQ \parallel DE$ Given

$$\therefore \frac{XP}{\boxed{}} = \frac{\boxed{}}{QE} \quad \text{..... (I) (Basic proportionality theorem)}$$

In $\triangle XEF$, $QR \parallel EF$ Given

$$\therefore \frac{\boxed{}}{\boxed{}} = \frac{\boxed{}}{\boxed{}} \quad \text{..... (II) Basic Proportionality Theorem}$$

$$\therefore \frac{\boxed{}}{\boxed{}} = \frac{\boxed{}}{\boxed{}} \quad \text{..... from (I) and (II)}$$

∴ seg PR || seg DF (converse of basic proportionality theorem)

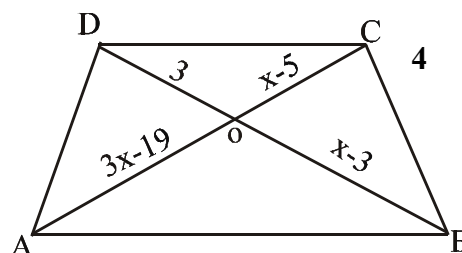
Q. 3 : B) Solve Any one.

3

- 1) Write the properties of similar triangles with suitable examples.
- 2) State and prove Angle bisector theorem.

Q. 4 : Attempt any one

- 1) In given figure $AB \parallel DC$ then find the value of x



2) In $\triangle ABC$, if $\angle ADE = \angle B$, then prove that $\triangle ADE \sim \triangle ABC$. Also, if $AD = 7.6$ cm, $AE = 7.2$ cm, $BE = 4.2$ cm and $BC = 8.4$ cm, then find DE .

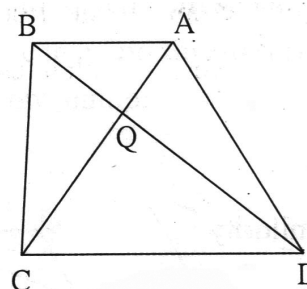
Q. 5 : Solve (any one)

3

1) In trapezium $ABCD$ side $AB \parallel$ side CD
diagonal AC and BD intersect each other at point P .

Then prove that $\frac{A(\triangle ABP)}{A(\triangle CPD)} = \frac{AB^2}{CD^2}$

2) Diagonal of quadrilateral $ABCD$ intersect in point Q . If $2QA = QC$, $2QB = QD$, then prove that $DC = 2AB$.







B.KUMAR'S ACADEMY

Subject : Math - II

QUESTION PAPER

Total Marks : 20

Class : X

2. Pythagoras theorem

Time : 1 Hour.

Q. 1 A) Choose the correct alternative from objectives given below. (2)

1) In $\triangle ABC$, M is the midpoint of side BC. If $AB^2 + AC^2 = 410\text{cm}^2$ and $BC = 12\text{cm}$, then what is the length of median AM?

- a) 6cm b) 6.5cm c) 12cm d) 13cm

2) What is the length of hypotenuse of a right angled triangle, if length of sides forming right angle are 9cm and 12cm ?

- a) 13cm b) 8cm c) 15cm d) 14cm

Q. 1 B) Solve the following question: (1)

1) In $\triangle LMN$, $\ell = 5$, $m = 13$, $n = 12$. State whether $\triangle LMN$ is a right angled triangle or not.

Q. 2 : A) Attempt any one of the following question. (2)

1) The hypotenuse of an isosceles right angled $\triangle ABC$ is $8\sqrt{2}$ cm. Find BC.

→ $\triangle ABC$ is an isosceles right angled triangle, by pythagoras theorem.

$$AC^2 = \square + BC^2 \quad \text{but } AB = \square (\because \text{given})$$

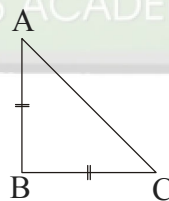
$$AC^2 = BC^2 + BC^2$$

$$AC^2 = 2\square$$

$$(8\sqrt{2})^2 = 2BC^2$$

$$64 \times 2 = 2BC^2$$

$$BC^2 = 64, \quad BC = \square \text{ cm}$$



2) Find the diagonal of a rectangle whose length is 35cm and breadth is 12cm.

→ Diagonal of rectangle divides in two right angled triangle.

$$\square = \square + \square$$

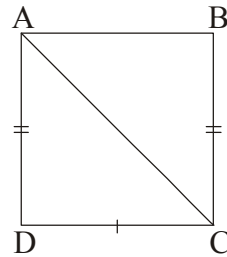
---[$\therefore$ Pythagorus theorem]

$$= 12^2 + 35^2$$

$$= 144 + 1225$$

$$= 1369$$

$$AC = \square$$



$\therefore$ Diagonal at rectengle is $\square$ cm.

Q. 2 : B) Attempt any one of the following question.

(2)

1) In $\triangle ABC$ seg AP is a median. If $BC = 18$, $AB^2 + AC^2 = 260$ Find AP.

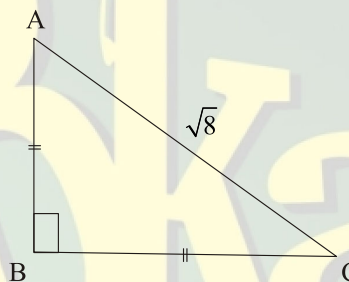
2) In $\triangle RST$, $\angle S = 90^\circ$, $\angle T = 30^\circ$, $RT = 12\text{cm}$, then find RS and ST.

Q. 3 : A) Attempt any one of the following questions.

(3)

1) To find AB and BC with the help of information given in figure complete the following activity

$AB = BC$ (Side opposite to congruent angle)



$$\angle BAC = 45^\circ$$

$$\therefore AB = BC = \square \times AC$$

$$= \square \times \sqrt{8}$$

$$= \square \times 2\sqrt{2}$$

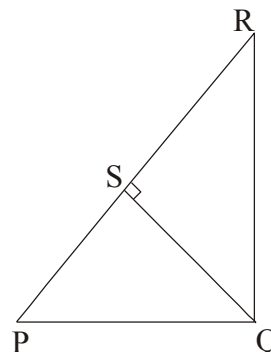
$$= \square$$

2) State and prove theorem of geometric mean.

→ Proof : In right angle trangle PQR

seg QS $\perp$ hypotenuse PR

$\triangle QSR \sim \triangle PSR$ [similarity of right triangle]



$$\frac{\boxed{}}{\boxed{}} = \frac{\boxed{}}{\boxed{}}$$

∴ seg QS is geometric mean of seg PS & SR.

$$\frac{\boxed{}}{\boxed{}} = \frac{\boxed{}}{\boxed{}}$$

$$QS^2 = PS \times SR.$$

Q. 3 : B) Attempt any one of the following questions.

(3)

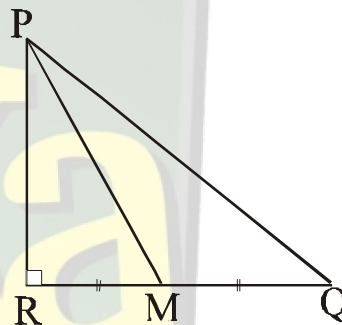
- 1) Find the perimeter of an isosceles right angled triangle with each of the congruent side measuring 7cm.
- 2) Seg AM is a median of $\triangle ABC$. If $AB=22$, $AC = 34$, $BC = 24$, Find AM.

Q. 4 : Solve the following (Any one)

(4)

- 1) Pranali and Prasad started walking to the East and to the North respectively, from the same point and at the same speed. After 2 hours distance between them was $15\sqrt{2}$ km. Find their speed per hour.

- 2) In the adjoining figure M is the midpoint of QR. $\angle PRQ = 90^\circ$
Prove that, $PQ^2 = 4PM^2 - 3PR^2$

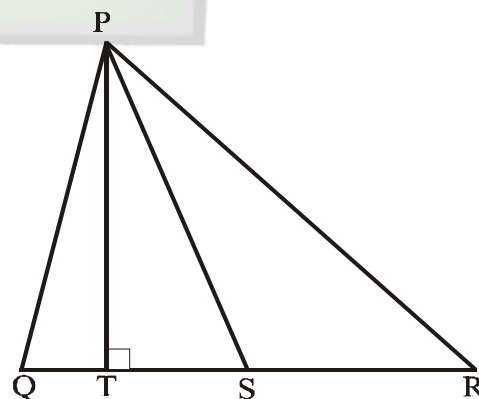


Q. 5 : Solve the following (Any one)

(3)

- 1) Prove that, the sum of the squares of the diagonals of a rhombus is equal to the sum of the squares of the sides.
- 2) In the adjoining figure seg PS is the median of $\triangle PQR$ and $PT \perp QR$ prove that.

$$i) PR^2 = PS^2 + QR \times ST + \left[\frac{QR}{2} \right]^2$$





B.KUMAR'S ACADEMY

Subject : Math - II

QUESTION PAPER

Total Marks : 20

Class : X

3. Circle

Time : 1 Hour.

Q. 1 A) Choose the correct alternative from Objectives given below. (2)

1) Two circles of radii 5.5 cm and 3.3cm respectively touch each other. what is the distance between their centers?

- a) 4.4cm b) 8.8cm c) 2.2cm d) 8.8cm or 2.2cm

2) $\angle ACB$ is inscribed in arc ACB of a circle with centre O. If $\angle ACB = 65^\circ$, find $m(\text{arc ACB})$.

- a) 65° b) 130° c) 295° d) 230°

Q. 1 B) Solve the following question. (1)

1) What is the distance between two parallel tangents of a circle having radius, 4.5cm? Justify your answer.

Q. 2 : A) Attempt any one of the following questions (2)

1) The distance between the centers of two circles touching internally is 5cm and touching externally is 19cm. Find the radii of the circles.

→ Let r_1 and r_2 be radii of circles.

Distance between center of internally touching circles is equal to difference of radii

$$\therefore r_1 - r_2 = 5\text{cm.}$$

$$\therefore r_1 = 5 + \boxed{} \quad \text{---(i)}$$

Distance between centers of internally touching circles is equal to

$$\therefore r_1 + r_2 = \boxed{} \quad \text{---(ii)}$$

from (i) and (ii)

$$5 + r_1 + r_2 = 19$$

$$2r_2 = 19 - \boxed{} = 14$$

$$r_2 = \frac{14}{\boxed{}} = 7$$

$$r_2 = 7\text{cm}$$

$$r_1 = 5 + r_2 = 5 + 7 = \boxed{} \text{cm.}$$

$\therefore$ radii of circles are $\boxed{}$ cm and $\boxed{}$ cm.

2) $\square\text{MRPN}$ is Cyclic, $\angle R = (5x - 13)^\circ$, $\angle N = (4x + 4)^\circ$. Find measures of $\angle R$ and $\angle N$.

$\rightarrow$ $\square\text{MRPN}$ is cyclic

$\therefore$ Opposite angles of cyclic quadrilateral are supplementary

$$\therefore \angle R + \angle N = \boxed{}$$

$$5x - 13 + 4x + 4 = 180$$

$$9x - \boxed{} = 180$$

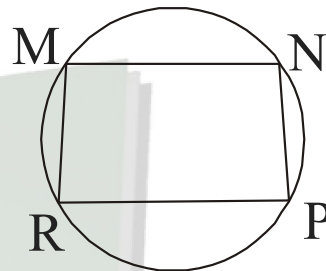
$$9x = \boxed{} + 9$$

$$9x = 189$$

$$x = \frac{\boxed{}}{9} = 21$$

$$\therefore \angle R = (5x - 13)^\circ = 5 \times 21 - 13 = 105 - 13 = \boxed{}$$

$$\angle N = (4x + 4)^\circ = 4 \times 21 + 4 = \boxed{} + 4 = 88^\circ$$



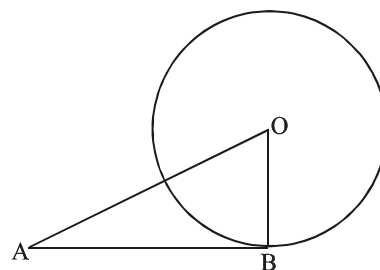
Q. 2 : B) Attempt any one of the following questions

(2)

1) If radii of two circles are 4cm and 2.8cm. Draw figure of these circles touching each other internally.

2) In the adjoining figure O is the centre of the Circle. $OA = 8.5\text{cm}$ Line AB is a tangent to the circle at the point B.

If $AB = 7.5\text{cm}$, find the radius of the circle.



Q. 3 : A) Attempt any one of the following questions

(3)

- 1) If secants containing chords AB and CD of a circle intersect outside the circle in point E, then $AE \times EB = CE \times ED$.

→ Construction : Draws AD and seg BC.

Proof : In $\triangle ADE$ and $\triangle CBE$

$$\angle AED \cong \angle CEB \quad \text{---(common angle)}$$

$$\angle DAE \cong \angle BCE$$

(Angles inscribed in same arc).

$$\therefore \square \sim \square \quad (\text{AA test})$$

$$\therefore \frac{\square}{\square} = \frac{\square}{\square} = \text{---}$$

(corresponding sides of similar triangle).

$$\square \times \square = \square \times \square.$$

- 2) $\square ABCD$ is a cyclic quadrilateral in which side $AB \parallel$ side DC prove that $AD = BC$

→ $\square ABCD$ is a cyclic quadrilateral opposite angles of cyclic quadrilateral are supplementary.

$$\therefore \angle A + \square = 180 \quad (1)$$

$$\angle B + \angle D = \square \quad (2)$$

Also, side $AB \parallel$ side DC , seg AD and seg BC are transversals.

$\therefore$ Interior angles on same side of a transversals are supplementary.

$$\therefore \square + \angle D = 180 \quad (3)$$

$$\text{and } \angle B + \angle C = 180 \quad (4)$$

$\therefore$ From equation (1) and (4)

$$\angle A = \square$$

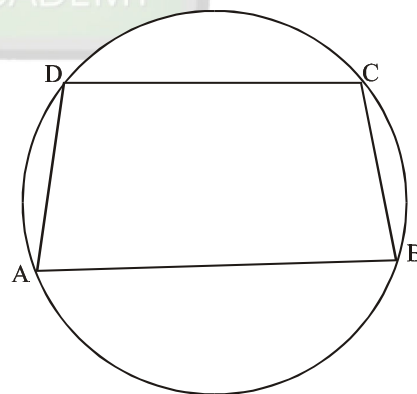
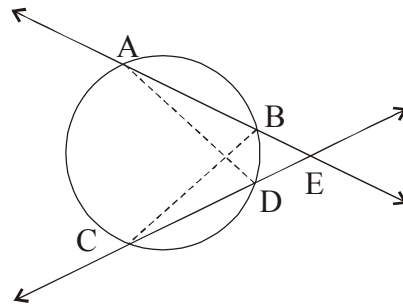
From equation (1) and (3)

$$\square = \angle D$$

$\therefore$ Base angles of $\square ABCD$ are equal

$\square ABCD$ is an isosceles trapezium

Hence non - parallel sides are congruent



$$\therefore \square = BC$$

Q. 3 : B) Attempt any one of the following questions

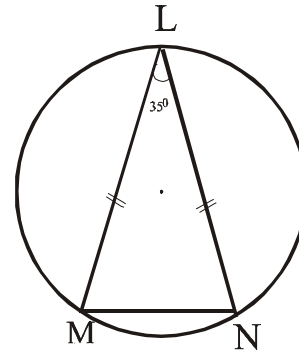
(3)

- 1) Point M, in the interior of the circle, is the point of intersection of two chords AB and CD of the same circle. show that $CM \times BD = BM \times AC$.
- 2) Prove that opposite angles of a cyclic quadrilateral are supplementary.

Q. 4 : Attempt any one of the following question

(4)

- 1) In the adjoining figure Chord $LM \cong$ Chord LN , $\angle L = 35^\circ$
 - (i) $m(\text{arc } MN)$
 - (ii) $m(\text{arc } LN)$

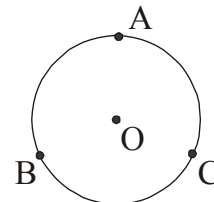


- 2) point O is the centre of a circle. Line 'a' & line 'b' are parallel tangents to the circle at P and Q. Prove that segment PQ is a diameter of the circle.

Q. 5 : Attempt any one of the following question

(3)

- 1) Prove that corresponding arcs of congruent chords of a circle (or congruent circles) are congruent.
- 2) A, B, C are any points on the circle with center 'O'
 - i) Write the names of all arcs formed due to these points.
 - ii) If $m(\text{arc } BC) = 110^\circ$ and $m(\text{arc } AB) = 125^\circ$ find measures of all remaining arcs.



B.KUMAR'S ACADEMY



B.KUMAR'S ACADEMY

Subject : Math - II

Question Paper

Total Marks : 20

Class : X

4. Geometric Construction

Time : 1 Hour

Q. 1 A) Choose the correct alternative from objectives given below.

2

1) The maximum number of tangents that can be drawn to a circle from a point out side it is.
.....

- a) 3 b) 2 c) one and only one d) 0

2) What is the point of concurrence of the altitudes of a triangle known as?

- a) Circumference b) In centre
c) Orthocenter d) Centroid

B) Solve the following question.

1

Construct a tangent to a circle with centre P and radius 3.2 cm at any point M on it.

Q 2 A) Attempt any ONE of the following.

2

- 1) Draw a circle with center 'O' and radius 3.5 cm. Take a point P at a distance 5.7 cm from the center. Draw tangents to circle from point P.
- 2) Draw a circle of radius 3.6cm. Draw a tangent to the circle at any point on it without using centre.

Q 2 B) Attempt any ONE of the following.

2

- 1) Draw seg PQ = 7cm. Divide it in the ratio 3:2.
- 2) $\triangle ABC \sim \triangle PQR$, in $\triangle ABC$, AB = 5.4 cm, BC = 4.2 cm, AC = 6.0 cm. AB : PQ = 3 : 2. Construct $\triangle ABC$ and $\triangle PQR$.

Q.3 A) Attempt any ONE of the following.

3

- 1) Draw a circle with radius 4.1 cm. Construct tangents to the circle from a point at a distance of 7.3 cm from the centre.
- 2) Draw a circle with centre O and radius 3cm. Take a point P at a distance of 7cm from the centre. Draw tangents to the circle from point P.

Q.3 B) Attempt any ONE of the following.

3

- 1) Draw a circle of radius 3.5 cm. Take a point R at a distance of 7cm from the centre. Draw tangents to the circle from point R.
- 2) Construct any $\triangle ABC$ construct $\triangle A'B'C'$ such that $AB : A'B = 5 : 3$ and $\triangle ABC \sim \triangle A'BC'$

Q. 4 : Attempt any ONE of the following.

4

- 1) $\triangle PQR \sim \triangle LTR$. In $\triangle PQR$, $PQ = 4.2\text{cm}$, $QR = 5.4\text{cm}$, $PR = 4.8\text{cm}$. Construct $\triangle PQR$ and $\triangle LTR$, Such that $\frac{PQ}{LT} = \frac{3}{4}$.
- 2) $\triangle ABC \sim \triangle APQ$ In $\triangle ABC$, $AB = 6.0\text{cm}$, $\angle BAC = 110^\circ$, $CA = 5.5\text{cm}$. $\frac{BA}{PA} = \frac{5}{3}$ construct $\triangle APQ$.

Q. 5 : Attempt any ONE of the following.

3

- 1) Draw $\triangle ABC$ with side $BC = 6\text{cm}$, $\angle B = 45^\circ$, $\angle A = 100^\circ$. construct a triangle whose sides are $\frac{4}{7}$ times the corresponding sides of $\triangle ABC$.
- 2) $\triangle AMT \sim \triangle AHE$. In $\triangle AMT$, $AM = 6.3\text{cm}$, $\angle TAM = 50^\circ$, $AT = 5.6\text{cm}$ $\frac{AM}{AH} = \frac{7}{5}$ construct $\triangle AHE$.

B.KUMAR'S ACADEMY



B.KUMAR'S ACADEMY

Subject : Math - II

Class : X

Question Paper

5. Co – ordinate Geometry

Total Marks : 20

Time : 1 Hour

Q.1: A) Choose the correct alternative from the following questions.

2

- 1) Seg AB is parallel to Y – axis and coordinates of point A are (1, 3) then co-ordinates of point B can be
a) (3, 1) b) (5,3) c) (3,0) d) (1, –3)
- 2) Distance of point (–3, 4) from the origin is
a) 7 b) 1 c) 5 d) –5

B) Solve the following question.

1

Find the slope of the line whose inclination is 45° .

Q.2 A) Attempt any ONE of the following.

2

- 1) Find the slopes of the lines passing through the points, L(–2, –3) and M(–6, –8)

$$L(-2, -3) = (x_1, y_1)$$

$$M(-6, -8) = (x_2, y_2)$$

$$\begin{aligned}\text{Slope of line LM} &= \frac{\boxed{}}{\boxed{}} \\ &= \frac{-8 - (-3)}{-6 - (-2)} = \frac{\boxed{}}{\boxed{}} \\ &= \frac{5}{4}\end{aligned}$$

- 2) Find the distance between the points A(2,3) and B(4,1)

$$\text{Let } A(2, 3) = (x_1, y_1) \text{ and } B(4, 1) = (x_2, y_2)$$

According to distance formula

$$\begin{aligned}d(A, B) &= \sqrt{(\boxed{})^2 + (y_2 - y_1)^2} \\ &= \sqrt{(4 - 2)^2 + (\boxed{})^2}\end{aligned}$$

$$= \sqrt{2^2 + (\square)^2}$$

$$= \sqrt{4 + 4}$$

$$= \sqrt{8}$$

$$= 2\square$$

Q.2 B) Attempt any ONE of the following.

2

- 1) If A (3,5), B (7,9) and point Q divides seg AB in the ratio 2:3 then find co-ordinates of point Q.
- 2) Find the co-ordinates of a point on y-axis which is equidistant from M(-5, -2) and N(3, 2).

Q.3 A) Attempt any ONE of the following.

3

- 1) Verify, whether points P (6, -6), Q (3,-7) and R (3, 3) are collinear.

$$PQ = \sqrt{(6-3)^2 + (\square)^2}$$

[By distance formula]

$$= \sqrt{3^2 + \square} = \sqrt{10} \quad \text{--- (1)}$$

$$QR = \sqrt{(3-3)^2 + (-7-3)^2}$$

$$= \sqrt{0^2 + (\square)^2} = \sqrt{100} \quad \text{--- (2)}$$

$$PR = \sqrt{(3-6)^2 + (3+6)^2}$$

$$= \sqrt{(-3)^2 + (9)^2} = \square \quad \text{--- (3)}$$

From (1), (2) and (3) out of $\square$, $\sqrt{100}$ and $\sqrt{90}$ $\sqrt{100}$ is the largest number now we will verify

whether $(\sqrt{100})$ and $(\sqrt{10} + \sqrt{90})$ are unequal For this compare $(\sqrt{100})^2$ and $(\sqrt{10} + \square)^2$

$$\therefore (\sqrt{10} + \sqrt{90}) > \sqrt{100}$$

$$\therefore PQ + PR \neq QR$$

$\therefore$ Points P(6, -6), Q (3, -7) and R (3, 3) are not collinear.

- 2) Find the value of K, if the points A(2,1), B(k, 3) and c(-3, -4) are collinear.

$$\text{Let } A(2, 1) = (x_1, y_1)$$

$$B(k, 3) = (x_2, y_2),$$

$$C(-3, -4) = (x_3, y_3)$$

The given points are collinear

$\therefore$ Slope of line AB = Slope of line BC

$$\frac{\boxed{}}{\boxed{}} = \frac{y_3 - y_2}{x_3 - x_2}$$

$$\frac{3-1}{k-2} = \frac{-4-3}{-3-k}$$

$$\frac{2}{k-2} = \frac{\boxed{}}{\boxed{}}$$

$$\boxed{} = \boxed{}$$

$$-2k + 7k = 14 + 6$$

$$5k = 20$$

$$\therefore k = \boxed{}$$

Q. 3 B) Attempt any ONE of the following.

3

- 1) Point p is the centre of the circle and AB is a diameter Find the co-ordinates of point B if co-ordinates of point A and P are (2, -3) and (-2, 0) respectively.
- 2) Show that A (-4, -7), B (-1, 2), C (8, 5) and D (5, -4) are the vertices of a parallelogram.

Q. 4 : Attempt any ONE of the following.

4

- 1) The line seg AB is divided into five congruent parts at P, Q, R and S such that A -P -Q-R-S-B. If point Q (12, 14) and S(4,18) are given find the coordinates of A, P, R, B.
- 2) A (-3, -4), B (-5, 0), C (3,0) are the vertices of $\triangle ABC$. Find the co-ordinates of the circumcenter of $\triangle ABC$.

Q.5: Attempt any ONE of the following.

3

- 1) Find the type of the quadrilateral if points A(-4,-2), B(-3, -7), C(3, -2) and D(2, 3) are joined serially.
- 2) Find the co-ordinates of the points of trisection of the line segment AB with A (2,7) and B (-4, -8)



B.KUMAR'S ACADEMY

Subject : Math - II

Class : X

Question Paper

6. Trigonometry

Total Marks : 20

Time : 1 Hour

Q.1:A) Choose the correct alternative from the following questions.

2

1) $1 + \cot^2 \theta = ?$

- a) $\cot^2 \theta$ b) $\operatorname{cosec}^2 \theta$ c) $\sec^2 \theta$ d) $\tan^2 \theta$

2) When we see at a higher level, from the horizontal line, angled formed is ____

- a) Angle of elevation b) Angle of depression
c) 0 d) Straight angle.

: B) Solve the following questions.

1

1) If $3 \sin \theta - 4 \cos \theta = 0$, find the value of $\tan \theta$

Q.2:A) Attempt any ONE of the following.

2

1) If $\sec \theta = \frac{25}{7}$, find the value of $\tan \theta$ by using identity.

→ $\tan^2 \theta = \boxed{} \dots\dots (\text{Identity})$

$$= \left(\frac{25}{7} \right)^2 - 1$$

$$= \boxed{} - 1 = \frac{625 - 49}{49} = \boxed{}$$

$$\tan \theta = \boxed{}$$

2) If $\cos \theta = \frac{5}{13}$, find the value of $\operatorname{cosec} \theta$ by using identity.

→ $\cos \theta = \frac{5}{13} (\text{Given})$

$$\sin^2 \theta = 1 - \cos^2 \theta \text{ [Identify]}$$

$$= 1 - \left(\frac{5}{\boxed{}} \right)^2 = 1 - \frac{25}{\boxed{}} = \frac{\boxed{} - 25}{169} = \frac{\boxed{}}{169}$$

$$\therefore \sin \theta = \frac{12}{13}$$

$$\operatorname{cosec} \theta = \frac{1}{\sin \theta} \text{ [Identity]}$$

$$= \frac{13}{12}$$

: B) Attempt any ONE of the following.

2

1) If $\cot \theta = \frac{15}{8}$, find the value of $\sin \theta$.

2) Prove that $\cos^2 \theta (1 + \tan^2 \theta) = 1$

Q.3 A) : Attempt any ONE of the following.

3

1) If $5 \sec \theta - 12 \operatorname{cosec} \theta = 0$, find the values of $\sec \theta$, $\cos \theta$ and $\sin \theta$

$$5 \sec \theta - 12 \operatorname{cosec} \theta = 0 \quad \dots \text{ (Given)}$$

$$5 \sec \theta = 12 \operatorname{cosec} \theta$$

$$\therefore \frac{\sec \theta}{\operatorname{cosec} \theta} = \frac{12}{5}$$

$$\therefore \frac{\frac{1}{\cos \theta}}{\frac{1}{\sin \theta}} = \frac{\boxed{}}{\boxed{}}, \quad \frac{\sin \theta}{\cos \theta} = \frac{12}{5}$$

$$\tan \theta = \frac{12}{5}$$

$$\sec^2 \theta = \boxed{} \text{ ----- (Identity)}$$

$$= 1 + \frac{144}{25}$$

$$= \frac{169}{25}$$

$$\sec \theta = \frac{13}{5}$$

$$\cos \theta = \frac{1}{\sec \theta} = \frac{5}{13}$$

$$\sin^2 = 1 - \boxed{} \text{ -----(Identity)}$$

$$= 1 - \left(\frac{5}{13} \right)^2 = 1 - \frac{25}{169} = \frac{144}{169}$$

$$\therefore \sin \theta = \frac{\boxed{}}{\boxed{}}$$

2) If $\tan \theta + \frac{1}{\tan \theta} = 2$, then show that $\tan^2 \theta + \frac{1}{\tan^2 \theta} = 2$,

→ $\tan \theta + \frac{1}{\boxed{}} = 2 \text{ (Given)}$

$$\left[\tan \theta + \frac{1}{\tan \theta} \right]^2 = \boxed{}$$

$$\tan^2 \theta + 2 \times \frac{\boxed{}}{\tan \theta} \times \boxed{} + \frac{1}{\boxed{}} = 4$$

$$\left[(a + b)^2 = a^2 + 2ab + b^2 \right]$$

$$\therefore \tan^2 \theta + \frac{1}{\tan^2 \theta} = \boxed{} - 2$$

$$\therefore \boxed{\tan^2 \theta + \frac{1}{\tan^2 \theta} = 2}$$

: B) Attempt any ONE of the following.

3

- 1) An observer at a distance of 10m from a tree looks at the top of the tree, the angle of elevation is 60° . what is the height of the tree? ($\sqrt{3} = 1.73$).
- 2) Two buildings are facing each other on a road of width 12 metre. From the top of the first building which is 10 metre high, the angle of elevation of the top of the second is found to be 60° what is the height of the second building?

Q. 4 : Attempt any ONE of the following.

4

- 1) Show that $\frac{\sin \theta - \cos \theta + 1}{\sin \theta + \cos \theta - 1} = \frac{1}{\sec \theta - \tan \theta}$
- 2) To find the width of the river, a man observes the top of a tower on the opposite bank making an angle of elevation of 61° . When he moves 50m backward from bank and observes the same top of the tower, his line of vision makes an angle of elevation of 35° . Find the height of the tower and width of the river. ($\tan 61^\circ = 1.8$, $\tan 35^\circ = 0.7$)

Q.5: Attempt any ONE of the following.

3

- 1) Prove $\sec^6 x - \tan^6 x = 1 + 3 \sec^2 x \times \tan^2 x$
- 2) Show that $\sec^4 A (1 - \sin^4 A) - 2 \tan^2 A = 1$

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B.K. KUMAR'S ACADEMY

Subject : Math - II
Class : X

Question Paper 7. Mensuration

Total Marks : 20
Time : 1 Hour

Q.1:A) Choose the correct alternative from the following questions.

2

1) If measure of an arc of a circle is 160° and its length is 44cm, find the circumference of the circle.

- a) 66cm b) 44cm c) 160cm d) 99cm

2) Find the side of a cube of volume 1m^3 .

- a) 1cm b) 10cm c) 100cm d) 1000cm

: B) Solve the following questions.

1

1) What is the area of a sector whose arc length and radius are 22cm and 7cm respectively?

Q.2:A) Attempt any ONE of the following.

2

1) Find the volume of a cone if the radius of its base is 1.5cm and its perpendicular height is 5cm.

Radius (r) = cm, height (h) = cm.

Volume of cone =

$$= \frac{1}{3} \times \frac{22}{7} \times 1.5 \times 1.5 \times 5$$

$$= \frac{82.5}{7}$$

$$= \text{ cm}^3$$

2) Find the total surface area of a cylinder if the radius of its base is 5cm and height is 40cm.

→ Radius (r) = 5cm, height (h) = 40cm

Total surface area of cylinder = $2\pi \text{} \left(r + \text{} \right)$

$$2 \times \text{} \times 5 \times \left(5 + \text{} \right)$$

$$= 31.4 \times 45$$

$$= 1413 \text{ cm}^2$$

Total surface area of cylinder is 1413 cm^2

: B) Attempt any ONE of the following.

2

- 1) Radius of a circle is 10cm. Measure of an arc of the circle is 54° . Find the area of the sector associated with the arc.
- 2) The radii of ends of a frustum are 14cm and 6cm respectively and its height is 6cm. Find its curved surface area.

Q.3: A) Attempt any ONE of the following.

3

- 1) How many solid cylinders of radius 10cm and height 6cm can be made by melting a solid sphere of radius 30cm?

→

Radius of a sphere, $r=30\text{cm}$

Radius of the cylinder, $R = 10\text{cm}$

Height of cylinder, $H = 6\text{cm}$

Let the number of cylinders be n .

volume of the sphere = $n \times$ volume of cylinder

$$\therefore n = \frac{\text{volume of the sphere}}{\text{volume of cylinder}} = \frac{\frac{4}{3}\pi(r)^3}{\pi(R)^2 H}$$

$$= \frac{\frac{4}{3}\pi r^3}{\pi R^2 H}$$

$$= \frac{\frac{4}{3}r^3}{R^2 H}$$

$$= \frac{\frac{4}{3} \times 30^3}{10^2 \times 6}$$

$$= 60$$

$\therefore$ 60 cylinders can be made.

- 2) A bucket is frustum shaped. Its height is 28cm. Radii of circular faces are 12cm and

15cm. Find the capacity of the bucket. $\left(\pi = \frac{22}{7}\right)$

$$r_1 = \boxed{} \text{ cm}, r_2 = \boxed{} \text{ cm}, h = \boxed{} \text{ cm}$$

capacity of bucket = volume of frustum

$$= \frac{1}{3} \pi h (r_1^2 + r_2^2 + r_1 \times r_2)$$

$$= \frac{1}{3} \times \frac{22}{7} \times 28 \times \boxed{}$$

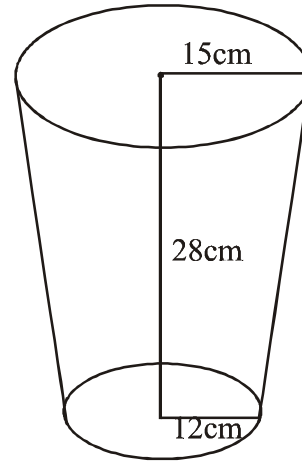
$$= \frac{22 \times 4}{3} \times 225 + 144 + 180$$

$$= \frac{22 \times 4}{3} \times 549$$

$$= 88 \times 183$$

$$= 16104 \text{ cm}^3$$

$$= \boxed{} \text{ lit.}$$

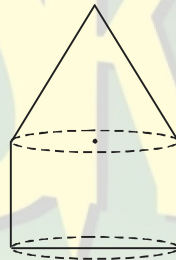


Capacity of bucket is $\boxed{}$ litre.

: B) Attempt any ONE of the following.

3

- 1) The area of a sector of a circle of 6cm radius is 15π sq.cm find the measure of the arc and length of the arc corresponding to the sector.
- 2) A cylinder and a cone have equal bases. The height of the cylinder is 3cm and the area of its base is 100cm^2 . The cone is placed upon the cylinder volume of the solid so formed is 500 cm^3 . Find the total height of the figure.



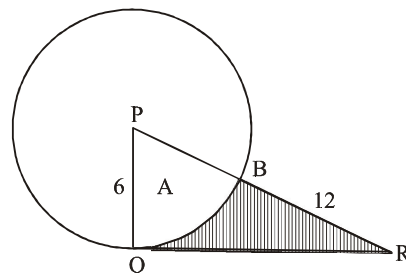
Q. 4 : Attempt any ONE of the following.

4

- 1) The circumferences of circular faces of a frustum are 132 cm and 88cm and its height is 24cm. Find the curved surface area and total surface area of the frustum.
- 2) In figure, P is the centre of the circle of radius 6cm. seg QR is a tangent at Q. If PR = 12, find the area of the shaded region. ($\sqrt{3} = 1.73$).

Q.5 : Attempt any ONE of the following.

3



- 1) The diameter and length of a roller is 120cm and 84cm respectively. To level the ground, 200 rotations, of the roller are required. Find the expenditure to level the ground at the rate of Rs. 10 per sq. m.
- 2) A tent of a circus is such that its lower part is cylindrical and upper part is conical. The diameter of the base of the tent is 48m and the height of the cylindrical part is 15m. Total height of the tent is 33m. Find area of canvas required to make the tent. Also find volume of air in the tent.

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