

PART-- A

## • MCQs

[40]

- |                   |                    |                              |                        |
|-------------------|--------------------|------------------------------|------------------------|
| 1) Five (c)       | 11) $4x^2 - 9$ (b) | 21) $a^2 - 16$ (b)           | 31) $\frac{17}{5}$ (a) |
| 2) 25(a)          | 12) rhombus (d)    | 22) $9a^2b^2 - 12ab + 4$ (d) | 32) $1\frac{1}{2}$ (d) |
| 3) 5(b)           | 13) 1000 (b)       | 23) $90^\circ$ (c)           | 33) 2 (b)              |
| 4) 3(b)           | 14) $2\pi rh$ (a)  | 24) trapezium (d)            | 34) 5 (b)              |
| 5) 2(c)           | 15) 16(c)          | 25) $2r$ (c)                 | 35) two (c)            |
| 6) 9(a)           | 16) $x^9$ (c)      | 26) 100 (b)                  | 36) $\square$ (b)      |
| 7) 0(a)           | 17) {1,2,5} (d)    | 27) 396(a)                   | 37) $-2x^2 + 2x$ (a)   |
| 8) N(d)           | 18) disjoint (c)   | 28) 440(b)                   | 38) $\emptyset$ (a)    |
| 9) irrational (d) | 19) A c B (a)      | 29) 2.6(a)                   | 39) 4(c)               |
| 10) $3x^2$ (d)    | 20) {P,Q,R} (d)    | 30) 1(a)                     | 40) Q (a)              |

PART—B

Q-1 Solve the following

[12]

Ans-1) 1) 13500

2	13500
2	6750
3	3375
3	1125
3	375
5	125
5	25
5	5
	1

$$13,500 = 2 \times 2 \times 3 \times 3 \times 3 \times 5 \times 5 \times 5$$

Here in the second group 3 is three times & 5 is three times but 2 is only two times if the given number is divided by 4, then the quotient will be perfect cube .

$$\frac{13500}{4} = \frac{2 \times 2 \times 3 \times 3 \times 3 \times 5 \times 5 \times 5}{2 \times 2}$$

$\therefore$  the given number 13500 should be divided by at least 4 so that the quotient is a perfect cube .

2) (1) Commutative property for addition

(2) Associative property for multiplication

(3) Existence of identity element for addition

$$3) 1) (8^{-2} \times 12^4) \div 27^2 = ((2^3)^{-2} \times (2^2 \times 3)^4) \div (3^3)^2$$

$$= 2^{-6} \times 2^8 \times 3^4 \div 3^6$$

$$= 2^{-6+8} \times 3^{4-6}$$

$$= 2^2 \times 3^{-2}$$

$$= \frac{2^2}{3^2}$$

$$= \frac{4}{9}$$

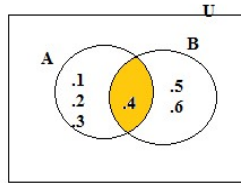
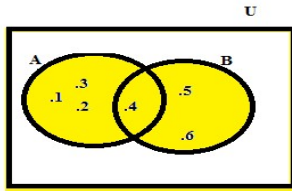
$$2) (625)^{\frac{1}{4}} = (5^4)^{\frac{1}{4}}$$

$$= 5^{4 \times \frac{1}{4}}$$

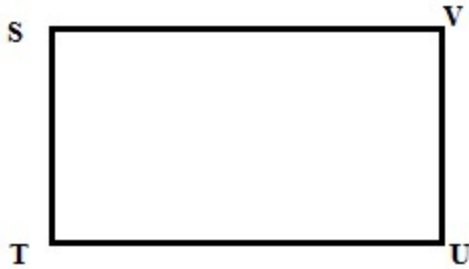
$$= 5^1$$

$$= 5$$

4)  $A = \{1, 2, 3, 4\}$      $B = \{4, 5, 6\}$      $A \cup B = \{1, 2, 3, 4, 5, 6\}$      $A \cap B = \{4\}$



5)



1) Clock wise : □SVUT, □VUTS, □UTSV, □TSVU

2) Anti clockwise : □STUV, □TUVS, □UVST, □VSTU

Q-2 Solve the following

[08]

1)  $d = 14 \text{ cm}$      $h = 20 \text{ cm}$

Curved Surface area of a cylinder =  $\pi dh$

$$= \frac{22}{7} \times 14 \times 20$$

$$= 880 \text{ cm}^2$$

Sheet required to make 1 Cylinder =  $880 \text{ cm}^2$

Sheet required to make 50 Cylinder =  $880 \times 50$

$$= 44,000 \text{ cm}^2$$

$$10,000 \text{ cm}^2 = 1 \text{ m}^2$$

$$\therefore 44,000 \text{ cm}^2 = \frac{44,000}{10,000} = 4.4 \text{ m}^2$$

Cost of  $1 \text{ m}^2$  Sheet = Rs. 200

Cost of  $4.4 \text{ m}^2$  Sheet =  $200 \times 4.4 = \underline{\text{Rs. 880}}$

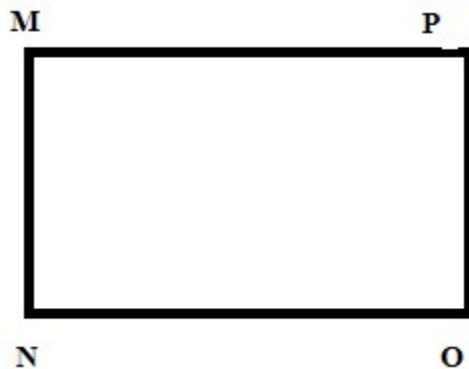
$$\begin{aligned}
2) 27 \times 32 &= (30-3)(30+2) \\
&= (30)^2 + 30(2-3) - 6 \\
&= 900 + 30(-1) - 6 \\
&= 900 - 30 - 6 \\
&= 864
\end{aligned}$$

$$\begin{aligned}
2) (5x-2y)(5x-4y) &= 25x^2 - 20xy - 10xy + 8y^2 \\
&= 25x^2 - 30xy + 8y^2
\end{aligned}$$

- 3)  $1) A \cap B = \{3, 5\}$        $4) A \cap B \cap C = \{5\}$   
 $2) B \cap C = \{5, 7\}$        $5) (A \cup B) \cap (B \cup C) = \{2, 3, 4, 5, 6, 7\}$   
 $3) A \cap C = \{4, 5\}$        $6) (A \cap B) \cup (B \cap C) = \{3, 5, 7\}$

Q-3 Solve the following

[12]



1) In  $\square MNOP$  Let  $m\angle M = x, m\angle N = x + 10^\circ, m\angle O = x + 20^\circ, m\angle P = x + 30^\circ$

For  $\square MNOP$ ,

$$m\angle M + m\angle N + m\angle O + m\angle P = 360^\circ$$

$$\therefore x + x + 10^\circ + x + 20^\circ + x + 30^\circ = 360^\circ$$

$$\therefore 4x + 60^\circ = 360^\circ$$

$$\therefore 4x = 360^\circ - 60^\circ$$

$$\therefore 4x = 300^\circ$$

$$\therefore x = \frac{300^\circ}{4}$$

$$\therefore x = 75^\circ$$

Hence,  $m\angle M = x = 75^\circ$

$$m\angle N = x + 10^\circ = 75^\circ + 10^\circ = 85^\circ$$

$$m\angle O = x + 20^\circ = 75^\circ + 20^\circ = 95^\circ$$

$$m\angle P = x + 30^\circ = 75^\circ + 30^\circ = 105^\circ$$

$$2) \text{ (i) } (2mn+3)(2mn-3) = (2mn)^2 - (3)^2 \\ = 4m^2n^2 - 9$$

$$\text{(ii) } (x^2-5)(x^2+3) = x^4 + 3x^2 - 5x^2 - 15 \\ = x^4 - 2x^2 - 15$$

$$3) \text{ (i) } \left[\frac{27}{4}\right]^4 \div \left[\frac{9}{8}\right]^6 = \left[\frac{3^3}{2^2}\right]^4 \div \left[\frac{3^2}{2^3}\right]^6$$

$$= \frac{3^{12}}{2^{16}} \div \frac{3^{12}}{2^{18}}$$

$$= \frac{3^{12}}{2^{16}} \times \frac{2^{18}}{3^{12}}$$

$$= 3^{12-12} \times 2^{18-16}$$

$$= 3^0 \times 2^2$$

$$= 1 \times 4$$

$$= 4$$

$$2) [(9^2 \div 5^2) \div (3^2 \div 5^2)] \div \frac{1}{15} = ((3^2)^2 \times 5^2) \div 3^2 \times 5^2 \times 15$$

$$= 3^4 \times 5^2 \div 3^2 \times 5^2 \times 5 \times 3$$

$$= 3^{4-2} \times 5^{2-2} \times 5 \times 3$$

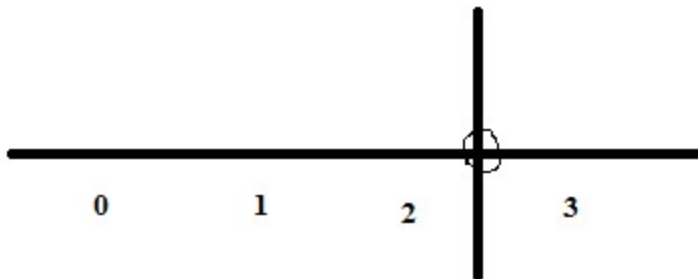
$$= 3^2 \times 5^2 \times 5 \times 3$$

$$= 3^{2+1} \times 1 \times 5$$

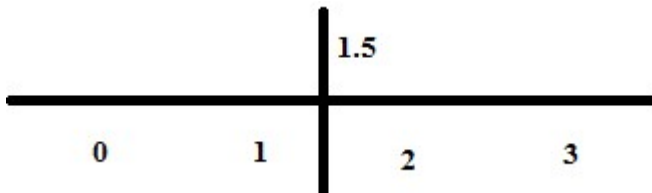
$$= 3 \times 5$$

$$= 15$$

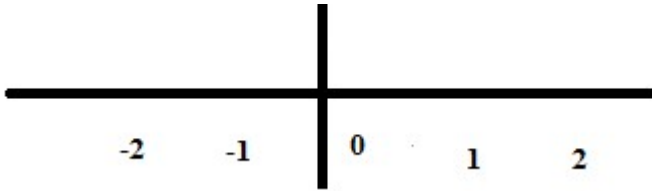
$$4) \quad 1) 2\frac{3}{4}$$



$$2) 1.5$$



3)  $\frac{-1}{2}$



5) 1) 17,576

$17576 = 2 \times 2 \times 2 \times 13 \times 13 \times 13$

2	17576
2	8788
2	4394
13	2197
13	169
13	13
	1

$= 2^3 \times 13^3$

$= (2 \times 13)^3$

$= 26^3$

$\sqrt[3]{17576} = 26$

2) 35,937

$35,937 = 3 \times 3 \times 3 \times 11 \times 11 \times 11$

3	35937
3	11979
3	3991
11	1331
11	121
11	11
	1

$= 3^3 \times 11^3$

$= (3 \times 11)^3$

$= 33^3$

$\sqrt[3]{35937} = 33$

Q-4 1)  $r = \frac{d}{2} = \frac{20}{2} = 10$  cm  $h = 10$  cm

Volume of cylinder =  $\pi r^2 h$

$= 3.14 \times 10 \times 10 \times 10$

$= 3140$  cm<sup>3</sup>

**OR**

1)  $r = 3.5$  m  $h = 10$  m

Volume of cylindrical well =  $\pi r^2 h$

$= \frac{22}{7} \times 3.5 \times 3.5 \times 10$

$= 385$  m<sup>3</sup>

Labour cost of digging  $1 \text{ m}^3 = \text{Rs.}60$

$\therefore$  Labour cost of digging  $385 \text{ m}^3 = 385 \times 60$

$= \text{Rs.} 23,100$

$$2) [(x^5)^{1/6} \times (x)^{1/7} \times (x^{2/3})^2] \div [(x^2)^{2/3} \times (x^{1/6})^5 \times (x^{1/7})]$$

$$= x^{\frac{5}{6} - \frac{5}{6}} \times x^{\frac{1}{7} - \frac{1}{7}} \times x^{\frac{4}{3} - \frac{4}{3}}$$

$$= x^0 \times x^0 \times x^0$$

$$= 1 \times 1 \times 1$$

$$3) \text{ (i) Expand : } (3a + \frac{1}{2})^2 = (3a)^2 + 2(3a)(\frac{1}{2}) + (\frac{1}{2})^2$$

$$= 9a^2 + 3a + \frac{1}{4}$$

$$\text{(ii) } 95 \times 105 = (100 - 5)(100 + 5)$$

$$= (100)^2 - (5)^2$$

$$= 10000 - 25$$

$$= 9975$$

$$4) \text{(i) } A = \{1, 2, 3, 4, 6, 12\} \quad B = \{1, 2, 3, 4, 5, 6\}$$

$$A \cup B = \{1, 2, 3, 4, 5, 6, 12\} \quad \& \quad A \cap B = \{1, 2, 3, 4, 6\}$$

$$\text{(ii) } B = \{x, y\}$$

$$\text{Subset} = \emptyset, \{x\}, \{y\}, \{x, y\}$$

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

$$\text{Subset} = \emptyset, \{a\}, \{b\}, \{c\}, \{a, b\}, \{b, c\}, \{a, c\}, \{a, b, c\}$$

*Finished*

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