

## Chapter End Test

Date : _____	<b>Mathematics</b>	<b>BATCH</b>
Duration: 45 Min. Max. Marks : 25	<b>Topic : PMI &amp; Linear Inequalities (Set-2)</b>	<b>XI</b>

**Disclaimer:** The objective is to test the understanding of the children. For long question is to write coherently in more than one paragraph.

**General instruction:**

1. This paper consist of two Sections. Students has to attempt both sections.
2. Section – A is objective carry 1 mark each.
3. Section – B is subjective.

**[Section – A]**

1. If  $x^n - 1$  is divisible by  $x - \lambda$ , then the least value of  $\lambda$  is  

(a) 1	(b) 2
(c) 3	(d) 4
2. For all  $n \in \mathbb{N}$ ,  $3 \times 5^{2n+1} + 2^{3n+1}$  is divisible by  

(a) 19	(b) 17
(c) 23	(d) 25
3. If  $10^n + 3 \times 4^{n+2} + \lambda$  is divisible by 9 for all  $n \in \mathbb{N}$ , then the least positive integral value of  $\lambda$  is  

(a) 5	(b) 3
(c) 7	(d) 1
4. Let  $P(n) : "2^n < (1 \times 2 \times 3 \times \dots \times n)"$ . Then the smallest positive integer for which  $P(n)$  is true  

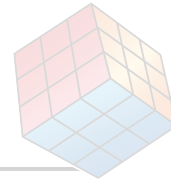
(a) 1	(b) 2
(c) 3	(d) 4
5. If  $P(n) : 49^n + 16^n + \lambda$  is divisible by 64 for  $n \in \mathbb{N}$  is true, then the least negative integral value of  $\lambda$  is  

(a) -3	(b) -2
(c) -1	(d) -4
6. The solution set of the in equation  $\frac{x^2}{x-2} > 0$   

(a) $x \in [2, \infty)$	(b) $(-\infty, 0)$
(c) $(0, \infty)$	(d) $(-\infty, 4]$
7. If  $(x^2 - 2x + 1)(x - 4) \geq 0$ , then  

(a) $(-\infty, 4]$	(b) $[4, \infty)$
(b) $(-\infty, 4)$	(d) none of these

8. If  $x < 7$ , then  
 (a)  $-x < -7$  (b)  $-x \leq -7$   
 (c)  $-x > -7$  (d)  $-x \geq -7$
9. If  $x$  is a real number and  $|x| < 5$ , then  
 (a)  $x \geq 5$  (b)  $-5 < x < 5$   
 (c)  $x \leq -5$  (d)  $-5 \leq x \leq 5$
10. The solution set of the inequation  $|x + 2| \leq 5$  is  
 (a)  $(-7, 5)$  (b)  $[-7, 3]$   
 (c)  $[-5, 5]$  (d)  $(-7, 3)$
11. If  $\frac{|x-2|}{x-2} \geq 0$ , then  
 (a)  $x \in [2, \infty)$  (b)  $x \in (2, \infty)$   
 (c)  $x \in (-\infty, 2)$  (d) None
12. If  $|x - 1| > 5$ , then  
 (a)  $x \in (-4, 6)$  (b)  $x \in [-4, 6]$   
 (c)  $x \in (-\infty, -4) \cup (6, \infty)$  (d) none
13. If  $|x + 2| \leq 9$ , then  
 (a)  $x \in (-7, 11)$  (b)  $x \in [-11, 7]$   
 (c)  $x \in (-7, \infty)$  (d) none
14. If  $x^2 < 0$ , then it is  
 (a) true (b) false  
 (c) can't say (d) none
15.  $(x - 7)^2 \geq 0$ , then  
 (a)  $x \in \mathbb{R}$  (b)  $x \geq 7$   
 (c)  $x < 7$  (d)  $x \geq -7$



## [Section – B]

16. Prove by principle of mathematical induction [4]  

$$1 \times 3 + 2 \times 4 + 3 \times 5 + \dots + n \times (n + 2) = \frac{1}{6} n(n + 1) (2n + 7)$$
17. (i) Solve :  $-5 \leq \frac{2-3x}{4} \leq 9$  [3]
- (ii) Solve :  $\frac{5x}{4} + \frac{3x}{8} \geq \frac{39}{8}$  [3]

OR

A manufacturer has 600 liters of a 12% solution of acid. How many liters of 30% acid solution must be added to it so that acid content in the resulting mixture will be more than 15% less than 18%? [6]



## Hints/Solutions to Chapter End Test

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[Section – A]

- |         |         |
|---------|---------|
| 1. (a)  | 2. (b)  |
| 3. (a)  | 4. (d)  |
| 5. (c)  | 6. (a)  |
| 7. (b)  | 8. (c)  |
| 9. (b)  | 10. (b) |
| 11. (b) | 12. (c) |
| 13. (b) | 14. (b) |
| 15. (a) |         |

[Section – B]

17. (i)  $x \in \left[ -\frac{34}{3}, \frac{22}{3} \right]$

(ii)  $x \in (3, \infty)$

$120 < x < 300$

OR

helps excel in boards