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## MATHS

## BOOKS - MAXIMUM PUBLICATION

## QUESTION PAPER MARCH 20

## Example

1. If ${ }^{`} \mathrm{~A}=\{\mathrm{x} x>7\}$, then $n(A)$ is
A. 1
B. 0
C. 2
D. 3

Answer: B

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## 2. The set builder form of $(6,12)$ is

a) $\{x: x \in \mathbb{R}, 6<x \leq 12\}$
b) $\{x: x \in \mathbb{R}, 6<x<12\}$

> c) $\{x: x \in \mathbb{R}, 6 \leq x \leq 12\}$
> d) $\{x: x \in \mathbb{R}, 6 \leq x<12\}$
A. $\{x: x \in \mathbb{R}, 6<x \leq 12\}$
B. $\{x: x \in \mathbb{R}, 6<x<12\}$
C. $\{x: x \in \mathbb{R}, 6 \leq x \leq 12\}$
D. $\{x: x \in \mathbb{R}, 6 \leq x<12\}$

Answer: B
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3. If A and B are two sets such that $A \subset B$
,then $A \cup B$ is a)A b )Null set c$) \mathrm{B}$
d) $\{\emptyset\}$
A. A
B. Null set
C. B
D. $\{\emptyset\}$

Answer: B

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4. In a survey of 600 students in a school, 150 students were found to be taking tea and 225
students were taking coffee. 100 were taking both tea and coffee. Find how many students were taking neither tea nor coffee.

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5. Find the principal and general solutions of $\cos e c x=-2$.
6. If the sum of first 20 terms of an AP is equal
to the sum of first 30 terms, then the sum of
first 50 terms is.... a) 50 b) 20 c) 0 d) 80
A. 50
B. 20
C. 0
D. 80

## Answer: C

# 7. Find the sum to infinity terms of the GP $\frac{-3}{4}$ 

$, \frac{3}{16}, \frac{-3}{64}, \ldots \ldots$.
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8. Find the sum of $n$ terms of the series
$7+77+777+$.

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## 9. Consider the following figure:

Find the distance of PQ .


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10. Find the derivative of $\cos x$ from first principle.

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## 11.

Derivative
$f(x)=1+x+x^{2}+x^{3}+\ldots+x^{50} \quad$ at
$x=1$ is a) 50 b) 1250 c) 1275 d) $\frac{101}{2}$
A. 50
B. 1250
C. 1275

## D. $\frac{101}{2}$

## Answer:

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12. Find $\lim _{x \rightarrow 0} f(x)$ if it exists, where
$f(x)= \begin{cases}\frac{|x|}{x} & x \neq 0 \\ 0 & x=0\end{cases}$

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13. For every positive integer n,prove that
$7^{n}-3^{n}$ is divisible by 4 using principle of mathematical induction.

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14. Modulus of a complex number $Z$ is 2 and
$\arg (z)=\frac{\pi}{3}$,write the complex number in the
form $a+i b$.

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15. Solve graphically:
$2 x+y \geq 4, x+y \leq 3,2 x-3 y \leq 6$
$x \geq 0, y \geq 0$

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16. Expand $\left(x+\frac{1}{x}\right)^{6}$

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17. Find the middle term in the expansion of $\left(\frac{x}{3}+9 y\right)^{10}$

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18. Let $A(1,2)$ be a fixed point and ' $P$ ' be a variable point in the same plane $P$ moves in the plane in such a way that its distance from

A is always a constant. Suppose ' $P$ ' is at the point (3,3),find the equation of the path traced by 'P'.
19. Consider the following ellipse:

Find the equation of the ellipse.

20. Write the contrapositive of the given
statement.
"If a number is divisible by 9 , then it is divisible by 3."

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21. Verify by the method of contradiction
$p: \sqrt{5}$ is irrational.
22. If $E$ and $F$ are two events such that
$P(E)=\frac{1}{4}, P(F)=\frac{1}{2}, P(E$ and $F)=\frac{1}{8}$
,find $P(E$ or $F)$

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23. If $E$ and $F$ are two events such that
$P(E)=\frac{1}{4}, P(F)=\frac{1}{2}, P(E$ and $F)=\frac{1}{8}$
,find P (not E and not F )

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24. A committee of two persons is selected from two men and two women. What is the probability that the committee will have one man?

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25. A committee of two persons is selected
from two men and two women. What is the probability that the committee will have two men?

# 5 <br> 26. If $\tan x=-\frac{5}{12}, x$ lies in second quadrant. 

Find all trigonometric functions.

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27. With out using triangle,find the value of $\frac{\sin x+\cos x}{\sin x-\cos x}$ if $\tan x=\frac{3}{4}$.

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28. Prove that $\frac{\sin 5 x+\sin 3 x}{\cos 5 x+\cos 3 x}=\tan 4 x$

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29. Find the number of different 8 letter arrangement that can be made from the letters of the word 'DAUGHTER' so that all vowels occur together.
30. Find the number of ways of choosing 4 cards from a pack of 52 playing cards. How many of these Four cards are of the same suits?

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31. Find the number of ways of choosing 4 cards from a pack of 52 playing cards. How many of these Four cards belong to different suits?
32. Find the number of ways of choosing 4 cards from a pack of 52 playing cards. How many of these Two are red cards and two are black cards?

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33. Consider the following diagram:

Find equation of a line passing through the
midpoint of $A B$ and perpendicular to $A B$.


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34. From the following table:

Find

Mean

| Classes | $30-40$ | $40-50$ | $50-60$ | $60-70$ | $70-80$ | $80-90$ | $90-100$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Frequency | 3 | 7 | 12 | 15 | 8 | 3 | 2 |

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## 35. From the following table:

## Find

Variance

| Classes | $30-40$ | $40-50$ | $50-60$ | $60-70$ | $70-80$ | $80-90$ | $90-100$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Frequency | 3 | 7 | 12 | 15 | 8 | 3 | 2 |

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36. From the following table:

Find

## Coefficient of variation.

| Classes | $30-40$ | $40-50$ | $50-60$ | $60-70$ | $70-80$ | $80-90$ | $90-100$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Frequency | 3 | 7 | 12 | 15 | 8 | 3 | 2 |

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