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India's Number 1 Education App

## MATHS

## BOOKS - JBD PUBLICATION

## MODEL PAPER (5)

Exericse

1. If $A$ and $B$ are two non-empty sets, then
$(A-B) \cup(B-A)$ is equal to:
A. $(A \cup B)-B$

$$
\text { B. } A-(A \cap B)
$$

C. $(A \cup B)-(A \cap B)$
D. $(A \cap B) \cup(A \cup B)$

Answer:

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2. The domain of the function
$f(x)=\frac{x^{2}+2 x+1}{x^{2}-x-6}$ is:
A. $R-\{3,2\}$

$$
\text { B. } R-\{3,-2\}
$$

C. $R-\{-3,-2\}$
D. $R-\{2,3\}$

Answer:

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## 3. The value of $\cos 75^{\circ}$ is:

A. $\frac{\sqrt{3}+1}{2 \sqrt{2}}$
B. $\frac{1-\sqrt{3}}{2 \sqrt{2}}$
C. $\frac{\sqrt{3}-1}{2 \sqrt{2}}$
D. $\frac{\sqrt{3}+1}{2}$

Answer:

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4. The value of $(1+i)^{4}+(1-i)^{4}$ is:
A. 8
B. 4

## C. -8

## D. none of these

## Answer:

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## 5. The number of arrangements of the letters

 of the word 'BHARAT' taken all at a time is:A. 360
B. 120
C. 260

## D. none of these

## Answer:

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6. If the sum of $n$ terms of an A.P. is given by
$\delta_{n}=3 n+2 n^{2}$, then the common difference of an A.P. is
A. 4
B. 3
C. 2
D. none of these

## Answer:

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7. The line segment joining the points $(-3,-4)$
and $(1,-2)$ is divided by $y$-axis in the ratio:
A. $1: 3$
B. 3:2
C. $3: 1$
D. none of these

## Answer:

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8. If the major axis of an ellipse is thrice the minor axis, then its eccentricity is equal to

$$
\text { A. } \frac{1}{3}
$$

B. $\frac{1}{\sqrt{3}}$
C. $\frac{1}{\sqrt{2}}$
D. $\frac{2 \sqrt{2}}{3}$

## Answer:

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## 9. $\lim _{x \rightarrow 0} \frac{\sin 2 x}{x}$ is equal to:

A. 2
B. $\frac{1}{2}$
C. 1
D. none of these

## Answer:

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10. Two dice are thrown simultaneously. The probability of obtainng a total score of 5 is,
A. $\frac{1}{9}$
B. $\frac{2}{9}$
C. $\frac{4}{9}$
D. none of these

## Answer:

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11. If $\cos (\theta+2 \alpha)=m \cos \theta$, prove that :
$\cot \alpha=\frac{1+m}{1-m} \tan (\theta+\alpha)$.

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12. If $\tan (x+y)=\frac{20}{21}, \tan \left(x-y 0=\frac{3}{4}\right.$,
then show thattan $2 x=\frac{143}{24}$.

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13. simplify: $5 i^{5}+4 i^{4}+3 i^{3}+2 i^{2}+i$

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14. Exapand: $\left(\frac{2}{x}-\frac{x}{2}\right)^{5}, x \neq 0$
15. Find

3rd term in the expansion of $\left(3 x-\frac{y^{3}}{6}\right)^{4}$.

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16. Show that $A(a, b, c), B(b, c, a)$ and $C(c, a, b)$ are
the vertices of an equilateral triangle.

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17. Write down the truth value of the following statement:

All integers are natural numbers.

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18. Write down the truth value of the following
statement:

Violet are blue.
19. Which of the following statements are true and which are false?

In each case give a valid reason for your answer.
p: Each radius of a circle is a chord of the circle.

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20. In a group of students, 100 students know

Hindi, 50 know English and 25 know both. Each
of the students knows either Hindi or English.

How many students are there in the group?

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21. If $A=\{3,5\}, B=\{2,4,6\}$. Find
$n(A \times B)$

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22. If $A=\{3,5\}, B=\{2,4,6\}$. Find
$n(B \times A)$
that:
$\sin 3 x+\sin 2 x-\sin x=4 \sin x \cos \frac{x}{2} \cos \frac{3 x}{2}$

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24. Using principle of mathematical induction, prove that:
$1+3+5+\ldots \ldots . . . .+(2 n-1)=n^{2}$.

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25. A bag contains 5 black and 6 red balls.

Determine the number of ways in which 2 black and 3 red balls can be selected.

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26. Find the value of $r$ if $5 .{ }^{4} P_{r}=6 .{ }^{5} P_{r-1}$.
27. If the sum of $n$ terms of an A.P is $n P+\frac{1}{2} n(n-1) Q$, where P and Q are constant, find the common difference.

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28. If the pth, qth and rth terms of an A.P. be $x, y, z$ repsectively, then show that :
$x(q-r)+y(r-p)+z(p-q)=0$

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29. Find a point on the $x$-axis which is equidistant from the points $(7,6)$ and $(3,4)$.

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30. Find the equation of ellipse that satisfy the given conditions:

Length of minor axis: 16 , foci $=(0, \pm 6)$

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31. Find the derivative of $\frac{1}{x^{2}}$

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

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33. One card is drawn from a well shuffled deck
of 52 cards. If each outcome is equally likely,
calculate the probability that card drawn is :
i) not an ace
ii) a black card
ii) not a black card
iv) a diamond
v) not a diamond.

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34. One card is drawn from a well shuffled deck
of 52 cards. If each outcome is equally likely,
calculate the probability that card drawn is :
i) not an ace
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v) not a diamond.

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35. One card is drawn from a well shuffled deck of 52 cards. If each outcome is equally likely, calculate the probability that card drawn is :
i) not an ace
ii) a black card
ii) not a black card
iv) a diamond
v) not a diamond.

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36. If $z=x+i y$ and $|z|=1$, show that the complex number $z_{1}=\frac{z-1}{z+1}$ is purely imagine.
37. Solve the following system of inequalities graphically: $3 x+2 y \leq 12, x \geq 1, y \geq 2$

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38. Find all pairs of consecutive odd natural numbers, both of which are larger than 10 , such that their sum is less than 40 .

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$$
m x^{2}+n \quad x<0
$$

39. If $\mathrm{f}(\mathrm{x})=n x+m \quad 0 \leq x \leq 1$ For what $n x^{3}+m \quad x>1$
integers m and n does both $\lim _{x \rightarrow 0} f(x)$ and
$\lim f(x)$ exist $x \rightarrow 1$

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40. Find the derivative of $\frac{\sec x-1}{\sec x+1}$

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41. Find the mean deviatioan about the mean
for the following data:

| $x$ | 10 | 30 | 50 | 70 | 90 |
| :---: | :---: | :---: | :---: | :---: | :---: |
| $f$ | 4 | 24 | 28 | 16 | 8 |

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