MATHS

BOOKS - JBD PUBLICATION

MODEL PAPER (4)

Exercise

1. If sets A={1,2,3,4} and B={2,4,6,8}, then A-B is:

A. {-1,-2,-3,-4}

B. {1,3}

C. {1,0,3}

D. none of these

Answer:

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2. The number of relations that can be defined on the set {x,y,z} is:

A. 9

B. 2^9

C. $2^9 - 1$

D. $2^8 - 1$

Answer:

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3. The angle between the minute and hour hands of a clock at 5:40 is:

A. 70°

B. 85°

C. 55°

D. none of these

Answer:

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4. The value of $i^9 + i^{19}$ is:

A. i

B. $-i$

C. 0

D. none of these

Answer:

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5. The value of $\frac{{}^{n}C_r}{\hat{} \; nC_{r+1}}$ is equal to:

A. $\frac{r+1}{n-r}$

B. $\frac{n}{n-r}$

C. $\frac{n-r}{r}$

D. none of these

Answer:

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6. If x, 2y, 3z are in A.P where distinct numbers x,y,z are in GP then the common ratio of the G.P. is

A. 3

B. $\frac{1}{3}$

C. 1

D. none of these

Answer:

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7. The lines x+(k-1)y+1=0 and $2x + k^2y - 1 = 0$ are at right angles if

A. k=1

B. kgt1

C. k=-1

D. none of these

Answer:

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8. The latus rectum of the ellipse $16x^2 + y^2 = 16$ is:

A. $/12$

B. $\frac{\sqrt{5}}{2}$

C. $\frac{\sqrt{3}}{5}$

D. none of these

Answer:

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9. $\lim_{x \to \frac{\pi}{2}} \frac{1 - \sin x}{\cos x}$ is equal to:

A. 0

B. -1

C. 1

D. none of these

Answer:

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10. A die is rolled then the probability that a number 1 or 6 may appear is:

A. $\frac{1}{2}$

B. $\frac{2}{5}$

C. $\frac{1}{3}$

D. none of these

Answer:

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11. Prove the following: $\frac{\sin 5x + \sin 3x}{\cos 5x + \cos 3x} = \tan 4x$

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12. Find the principal solutions of $\cos x = -\frac{1}{\sqrt{2}}$.

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13. Express $\left(-2-\frac{1}{3}i\right)^3$ in the form of $a+ib$.

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14. Prove that: $\sum_{r=0}^{n} 3^{rn}C_r = 4^n$.

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15. Using Binomial Theorem, evaluate each of the following:$(99)^5$.

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16. Find the points on x-axis which are at a distance of $\sqrt{29}$ units from point A(1,2,3).

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17. Write the negation of the following statements

p: all cats scratch.

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18. Find the component statements of the following compound statements and check whether they are true or false.

100 is divisible by 3, 11 or 5.

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19. Find the range of $f(x) = \frac{3}{2 - x^2}$.

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20. Prove that: $\frac{1 + \sin 2x - \cos 2x}{1 + \sin 2x + \cos 2x} = \tan x$

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21. Find the general solution of the following equations: $\sin x + \sin 3x + \sin 5x = 0$

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22. Find the general solution of the following equations: $\cos 3x + \cos x - \cos 2x = 0$

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23. Using principle of mathematical induction of prove that:

$1+2+3+\ldots\ldots\ldots+n<\frac{1}{8}(2n-1)^2 f \text{ or } alln \in N$

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24. Use principle of mathematical induction to prove that:$1+2+3+\ldots\ldots\ldots+n=\frac{n(n+1)}{2}$

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25. Prove the following by using the principle of mathematical induction for all $n \in N$:-

$1^3 + 2^3 + 3^3 + \ldots + n^3 = \left(\frac{n(n+1)}{2}\right)^2$.

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26. Find n if ${}^{n-1}P_3 : {}^nP_4 = 1:9$.

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27. If m times the mth term is equal to n times the nth term of an A.P. prove that(m+n)th term of an A.P. is zero.

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28. Without using the pythagorus, show that the points (4, 4), (3, 5) and (-1, -1) are the vertices of a right angled triangle.

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29. Find the equation of a hyperbola whose vertices lie on y-axis, centre is at the origin, the distance between the foci is 16 and eccentricity is $\sqrt{2}$.

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30. Find the derivative of $\frac{2}{x+1} - \frac{x^2}{3x-1}$.

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31. An integer is chosen from the first 200 integers. Find the probability that it is divisible by 6 or 8.

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32. Find the squre root of $1 + 2\sqrt{6}i$.

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33. Convert the complex number $-\sqrt{3}-i$ in the polar form. Also find their modulus and arguments.

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34. Solve the following system of unequalities graphically: $3x+2y \leq 12, x \geq 1, y=2$.

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35. How many litres of water will have to be added to 1125 litres of the 45% solution of acid so that the

resulting mixture will contain more than 25% but less than 30% acid content?

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36. Find the derivative of xsinx

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

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38. Find the mean and variance of the first n natural numbers.

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39. Find the mean and variance of the following frequency distribution:

classes	0 - 30	30 - 60	60 - 90	90 - 120	120 - 150	150 - 180	180 - 210
frequency	2	3	5	10	3	5	2

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