MATHS

BOOKS - OMEGA PUBLICATION

SAMPLE QUESTION PAPER -2

Section A 1 Mark

1. State whether each of the following set is finite or infinite: The set of circles passing through the origin (0,0)

A. infinite set

B. finite set

C. null set

D. none of these

Answer:

2. Let $f(x) = \dfrac{|x|}{x}$, then $f(-3)$ equals :

A. -3

B. -2

C. -1

D. None of these

Answer:

3. Complex conjugate of $3i - 5$ is :

A. $3i + 5$

B. $-3i + 5$

C. $-3i - 5$

D. None of these

Answer:

4. Period of $\sin 3x$ is

A. π

B. 2π

C. 3π

D. None of these

Answer:

5. The value of $^{15}C_{11} \div {}^{15}C_{10}$ equals :

A. $15/11$

B. $15/11$

C. $5/10$

D. $5/11$

Answer:

6. Find the value of n so that $\dfrac{a^{n+1} + b^{n+1}}{a^n + b^n}$ may be the geometric mean between a and b.

A. 0

B. $-1/2$

C. $1/2$

D. 1

Answer:

7. The equation of the line passing through (1,2) and perpendicular to the line $x + y + 1 = 0$ is :

A. $y - x + 2 = 0$

B. $y - x + 1 = 0$

C. $y - x - 1 = 0$

D. $y - x - 2 = 0$

Answer:

8. The eccentricity of the hyperbola $4x^2 - 9y^2 = 36$ is :

A. $\sqrt{\dfrac{13}{3}}$

B. $\dfrac{\sqrt{13}}{3}$

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

D. 2

Answer:

9. $\lim\limits_{x \to 0} \dfrac{e^{3x} - 1}{x}$ is :

A. -3

B. $1/3$

C. 3

D. ∞

Answer:

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10. The probability of a number greater than 6, when a die is tossed is :

A. 0

B. 1

C. 1/6

D. None of these

Answer:

Section B 2 Mark

1. Prove that $\sin^2 \dfrac{\pi}{6} + \cos^2 \dfrac{\pi}{3} - \tan^2 \dfrac{\pi}{4} = \dfrac{-1}{2}$

2. Solve : $\sin^2 x + 3\cos^2 x = 9$

3. Prove that $|z| = |-z|$

4. Prove that the number of all subsets of a finite set of

n element is 2^n.

5. Show that the points $(1, 2, 3), (-1, -2, -1), (2, 3, 2)$ and $(4, 7, 6)$ are the vertices of a parallelogram.

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6. Check the validity of the statement : "100 is a multiple of 4 and 5"

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7. Find the component statement of the following and .

"100 is divisible by 4,10 and 5.

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1. If X and Y are two sets such that n (X) = 17, n (Y) = 23 and $n(X \cup Y) = 38$, find $n(X \cap Y)$.

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2. Which of the following functions are odd or even or neither :

$$f(x) = \tan x + 3 \ \ \cosec \ \ x + x$$

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3. Which of the following functions are odd or even or neither :

$$f(x) = |x| + 1$$

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4. Which of the following functions are odd or even or neither :

$$f(x) = |x - 2|$$

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5. $\dfrac{\tan A + \sec A - 1}{\tan A - \sec A + 1} = \dfrac{1 + \sin A}{\cos A}$.

6. Prove that $:\cos 20° \cos 40° \cos 80° = \dfrac{1}{8}$

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

$$1.2 + 2.3 + 3.4 + \ldots + n.(n+1) = \left[\dfrac{n(n+1)(n+2)}{3}\right]$$

8. Find n if $^{n-1}P_3 : {}^n P_4 = 1 : 9.$

9. Determine the sum of first thirty five terms of an arithematic progression if $t_2 = 2$ and $t_7 = 22$.

10. If the pth, qth and rth terms of an A.P. be x,y,z repsectively, then show that :

$$x(q - r) + y(r - p) + z(p - q) = 0$$

11. If p is the length of perpendicular from the origin to the line whose intercepts on the axes are a and b, then show that $\dfrac{1}{p^2} = \dfrac{1}{a^2} + \dfrac{1}{b^2}$.

12. Find the equation of the parabola which is symmetric about y-axis and passes through the point $(2, -3)$.

13. Find the equation of the ellipse satisfying the following conditions : Vertices at $(\pm 13, 0)$, foci at (± 5.0).

14. Find $\lim\limits_{x \to 0} \dfrac{\tan 2x - \sin 2x}{x^3}$.

15. Two dice are toosed once. Find the probability of getting 'an even number on the first dice or a total of 8'

16. Find the square root of $-7 - 24$ i.

Section D 6 Mark

1. Solve the equation : $x^2 - \left(3\sqrt{2} + 2i\right)x + 6\sqrt{2}i = 0$

2. In the first four examinations, each of 100 marks, Hamid got 94,73,72, 84 marks if the final average is greater than or equal to 80 and less than 90 is needed to obtain a final B grade in a course, what range of marks in the fifth (last) examination will result in Hamid receiving 'B' in the course ?

3. Find the derivatives of $x^3 \sin x + 2x \cos x - 2x \sin x$ w.r.t x.

4. Use delta method to find the derivative of $\sec(2x - 1)$.

5. The mean of 5 observation is 4.4 and their variance is 8.24. If three of the observations are 1,2 and 6, find the other two observations