MATHS

BOOKS - ARIHANT PUBLICATION

BIHAR

MODEL SOLVED PAPER 2020

Section Iii Mathematics

1. If $\theta$is theta and $\frac{\cos^2\theta}{\cot^2\theta - \cos^2\theta} = 3$ then θ is equal to

A. $\frac{\pi}{4}$

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

C. $\frac{\pi}{2}$

D. $\frac{\pi}{6}$

Answer: B

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2. If

$x = r\cos\alpha\cos\beta, y = r\cos\alpha\sin\beta, z = r\sin\alpha$

then $x^2 + y^2 + z^2$=

A. r^2

B. $r^2 + z^2$

C. $r^2 - z^2$

D. $-z^2$

Answer: C

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3. Average age of 30 girls is 14yr. If 5 girls of average age of 15yr leave the class, then find the average age of remaining girls.

A. 13.8yr

B. 12.8yr

C. 9yr

D. 14yr

Answer: A

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4. Median of series 37.5, 35, 38.5, 31, 27, 39, 34, 30.5 is

A. 31

B. 35

C. 34

D. 34.5

Answer: D

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5. To find the value of histogram, helps to find out

A. Mode

B. Median

C. Arithmetic mean

D. Geometric mean

Answer: A

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6. If the mean and median of a set of numbers are 8.9 respectively then the mode will be

A. 9.2

B. 8.2

C. 7.2

D. 10.2

Answer: A

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7. Mode of 2, 3, 1, 2, 5, 3, 2, 2, 3, 5 is

A. 3

B. 2

C. 1

D. 5

Answer: B

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8. An equilateral triangle has equal perimeter to a square. If diagonal of that square is $6\sqrt{2}cm$, then area of triangle is

A. $12\sqrt{2}cm^2$

B. $16\sqrt{3}cm^2$

C. $16\sqrt{2}cm^2$

D. $12\sqrt{3}cm^2$

Answer: B

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9. The difference between the circumference and radius of a circle is 37cm. The area of the circle is

A. $259cm^2$

B. $16\sqrt{3}cm^2$

C. $16\sqrt{2}cm^2$

D. $154cm^2$

Answer: D

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10. If the outer diameter of metal pipe is 4cm and inner diameter is 3cm. Its length is 20cm, then the volume of metal used is

A. $220cm^3$

B. $110cm^3$

C. $22cm^3$

D. $440cm^3$

Answer: B

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11. If a diagonal of a rectangle is thrice its smaller side, then its length and breadth are

in the ratio $3:1$ (b) $\sqrt{3}:1$ (c) $\sqrt{2}:1$ (d) $2\sqrt{2}:1$

A. $\sqrt{3}:1$

B. $3:2$

C. $2\sqrt{2}:1$

D. $\sqrt{2}:1$

Answer: C

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12. The length of the minute hand of a clock is 14 cm. Find the area swept by the minute hand in 5 minutes.

A. $50.3cm^2$

B. $51.3cm^2$

C. $52.3cm^2$

D. $53.1cm^2$

Answer: B

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13. An observer of length 1.5m is standing 30m away from a tower. Angle of elevation from eye is 45°, then the height of tower is

A. 30m

B. 31.5m

C. 28.5m

D. 29.5m

Answer: B

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14. If $f(x) = x^2 + 5x + p$ and $g(x) = x^2 + 3x + q$ have a common factor, then $(p - q)^2 =$

A. $2(5p - 3q)$

B. $2(3p - 5q)$

C. $3p - 5q$

D. $5p - 3q$

Answer: B

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15. The capacities of two hemispherical vessels are 6.4 litres and 21.6 litres. The areas of inner curved surfaces of the vessels will be in the ratio of $\sqrt{2} : \sqrt{3}$ (b) 2 : 3 (c) 4 : 9 (d) 16 : 81

A. $4:9$

B. $2:3$

C. $\sqrt{2}:\sqrt{3}$

D. $16:81$

Answer: A

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16. The base radius of the cylinder is 1 2/3 times its height. The cost of painting its C.S.A. at 2 paise/cm^2 is Rs 92.40. The volume of the cylinder is

A. $80850cm^3$

B. $80580cm^3$

C. $4025cm^3$

D. $40290cm^3$

Answer: A

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17. A can do a work in 20 days. B can do a work in 30 days and C can do a work in 60 days. If 'B' and 'C' helps A every third day, then how many days after work will complete?

A. 12 days

B. 15 days

C. 18 days

D. 10 days

Answer: B

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18. The sum of the additive inverse and multiplicative inverse of 2 is

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

B. $-\frac{3}{2}$

C. $\frac{3}{2}$

D. $-\frac{1}{2}$

Answer: B

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19. If $(x-k)$ is the HCF of $3x^2+14x+16$ and $\left(6x^3+11x^2-4x-4\right)$, then the value of k

A. $\frac{2}{3}$

B. 2

C. -2

D. $-\frac{1}{2}$

Answer: C

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20. Inverse of $-3+\frac{5}{x-2}$ is

A. $\frac{2x+11}{x+3}$

B. $-3+\frac{x-2}{5}$

C. $-\frac{1}{3}+\frac{x-2}{5}$

D. $3 - \frac{5}{x-2}$

Answer: A

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21. Which of the following option is satisfied for the value of $2x - 3 > 7 - x$?

A. $x = \frac{10}{3}$

B. $x < \frac{10}{3}$

C. $x > 4$

D. $x > \frac{10}{3}$

Answer: D

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22. If the ratio of roots of equation $3x^2 - kx + 14 = 0$ is $7:6$, then value of k is

A. 1

B. 12

C. 13

D. -3

Answer: C

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23. The mth term of an A.P. is $\frac{1}{n}$ and nth term is $\frac{1}{m}$. Its (mn)th term is :

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

B. 1

C. 0

D. mn

Answer: B

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24. If intrinsic angle of polygon are in arithmetic series and its smallest angle is 100° and maximum angle is 140°, then number of sides of polygon is

A. 6

B. 10

C. 11

D. 5

Answer: A

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25. Fill in the Blanks :A figure formed by joining the mid points of a parallelogram is_____

A. Rectangle

B. Rhombus

C. square

D. Parallelogram

Answer: D

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26. Point P(4,6) divides the line segment $A(-2, 3)$ and B(6,7) in the ratio

A. $\frac{2}{3}$

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

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

D. $\frac{3}{2}$

Answer: C

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27. A couple of dies is thrown, then probability of getting a sum number 5 is

A. $\frac{1}{6}$

B. $\frac{1}{36}$

C. $\frac{1}{12}$

D. $\frac{1}{9}$

Answer: D

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28. If $\frac{\cos\theta}{a} = \frac{\sin\theta}{b}, then \frac{a}{\sec 2\theta} + \frac{b}{\cos ec2\theta}$ is equal to

A. a

B. b

C. $\frac{a}{b}$

D. $a + b$

Answer: A

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29. If $x = \sqrt{3} + \sqrt{2}$, then value of $\left(x^2 + \frac{1}{x^2}\right)$ is

A. $2\sqrt{3}$

B. 10

C. 12

D. 14

Answer: B

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30. A radius of circle is 2.5cm AB and CD two parallel chords are at distance of 2.7cm. It AB=4.8cm, then value of CD is

A. 4.8cm

B. 2.4cm

C. 3cm

D. 4cm

Answer: C

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