MATHS

BOOKS - UNITED BOOK HOUSE

MODEL QUESTION PAPERS-SET 5

Exercise

1. If any two sets A and B, $(A \cup B)' \cup (A' \cup B) =$

A. a)A

B. b)B

C. c)A'

D. d)B'

Answer:

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2. If the roots of the equation (x - p) (x - q) -r = 0 are α,β then the roots of the equation $(y-\beta)(y-\alpha)$ + r = 0 are

A. a)p,q

B. b)p,r

C. c)q,r

D. d)none of these.

Answer:

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3. 10 tube lights are in a hall and there are10 switchs are in every tube light. How many way the hall islighting?

A. a)10!

B. b)1023

C. c)10^2

D. d)2^{10}

Answer:

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4. If the sum of an infinite G.P. series is equal to the sum of 5 times of its odd terms, then the common ratio will be

A. a)5

B. b)4

C. c)2

D. d)3

Answer:

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5. The equation of a straight line which intersects the axes in equal length and passes through (1, -2) is

A. a)x-1=y

B. b)x+y=1

C. c)x-y+1=0

D. d)x+y+1=0

Answer:

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6. Number of tangents of $x^2 + y^2 - 25 = 0$ on $(4, \pm 3)$ are

A. a)0

B. b)1

C. c)2

D. d)3

Answer:

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7. value of $\lim_{x \to 0} \frac{\cos x - 1}{x^2}$ is

A. a)-1/2

B. b)2

C. c)1

D. d)2

Answer:

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8. If at x = t, the derivative of f(x) is f'(t) then.the value of $\lim_{x \to t} \frac{xf(t) - tf(x)}{x - t}$ is

A. a) $tf(t) - f'(t)$

B. b) $f(t) - tf'(t)$

C. c) $f(t) + tf(t)$

D. d) $tf'(t) - f(t)$

Answer:

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9. If the odds in favour of an event are 7 :1, then the probability of occurrence is

A. a)1

B. b)1/7

C. c)1/5

D. d)7/8

Answer:

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10. Mode of .2, 7, 5, 3, 7, 1, 6, 9, 7, 3, 6, 3 is

A. a)3

B. b)7

C. c)6

D. d)2

Answer:

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11. For any two sets A and B, Prove that $A \cup (A \cap B) = A$.

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12. Show that $f(x) = \log\left[x + \sqrt{1 + x^2}\right]$ is a odd function.

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13. If $\tan 26^\circ$ and $\tan 19^\circ$ are the roots of the equation $ax^2 - bx - fc = 0$. Show that a - b = -fc.

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14. If $\tan 15^\circ = x$.then show that $x^2 + 2\sqrt{3}x - 1 = 0$

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15. In a quadratic equation of the form $ax^2 + bx + c = 6$ the co-efficient of x is misprinted 17 in the place for 13 and the roots are (-2) and (-15). Find the roots of the equation if correctly printed.

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16. Show that. $\sqrt{i} + \sqrt{-i} = \sqrt{2}$

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17. Prove that by using the principle of mathematical induction for all $n \in N$:

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

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18. In a n sided polygon joining by straight line all the angular points. . and obtained, the triangles are in number 5n' Find the value of n.

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19. Find the equation of a straight line passes through (-3, 10) and the length of intercept by the axes are equal.

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20. Find the ratio in which the straight line 3x + y = 9 divides the line segment joining the points (1, 3) and (2, 7).

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21. Prove that: $\lim_{x \to 0} \frac{\tan x}{x} = 1$

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22. If $y = \tan^{-1}(\sec x + \tan x)$, show that , $\frac{dy}{dx} = \frac{1}{2}$.

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23. A and B are two independent event. It P(A) = 1/2 and $P(A \cup B)$=2/3,find the value of P(B).

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24. Find the mean deviation with respect ' to mean value :18,22,33,42,53,60.

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25. Find the HCF of 15, 40, 60 with the help of set theory

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26. If $13\theta = \pi$,show that $\cos\theta \cos 2\theta \cos 3\theta \cos 4\theta \cos 5\theta \cos 6\theta = 2^{-6}$

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27. Solve:$\sin x - \sin 2x = \cos 2x - \cos x$

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28. Show that by mathematical- induction : $x^3 + (x+1)^3 + (x+2)^3$is divisible by 9.

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29. If $z = x + iy$ and $\arg\left(\frac{z-1}{z+1}\right) = \frac{\pi}{4}$, then the locus of (x, y) is

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30. If the co-efficient of the (3r+1) th term is equal to the co-efficient of (r + 5) th term of the expansion of $(1 + x)^{32}$, find the value of r.

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31. Find the sum of 1 + 5 + 12 + 22 + 35 +....upto n term.

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32. A straight line passes through A(1, 2) and makes an angle θ with the positive x axis. This .staight line intersects the straight line x + y = 4 at A_1. If the distance from A to A_1 is $\frac{\sqrt{6}}{3}$, find the value of θ.

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33. Find the equations of the lines, which cut-off intercepts on the axes whose sum and product are 1 and -6, respectively.

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34. The equation of circum circle of an equilateral triangle is $x^2 + y^2 + 2gx + 2fy + c = 0$.Find the area of the triangle.

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35. A straight line passes through (h, k) and the middle point of the also (h, k). Show that the equation of straight line kx + hy = 2hk.

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36. Evaluate : $\lim_{x \to 0} \frac{\tan 2x - x}{3x - \sin x}$

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37. From definition, differentiate cos4x at 'x=pi/6`,will respect to x.

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38. Prove the following by contradiciton ."The sum of a rational and an irrational number is an irrational number?".

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39. Show that $\sqrt{7}$ is an irrational, (use the method of contradiction)

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40. If the variance of lst.n even natural numbers is 65, find the value of n

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41. In on examination the probability of a student passed in physics is 2/3 , passed in both English,and physics is 14/45, If the probability of passing at least one subject is4/5 , find the probability of passing in English?

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42. If p $\sin(\alpha+\beta)=\cos(\alpha-\beta)$, show that $\frac{1}{1-p\sin 2\alpha}+\frac{1}{1-p\sin 2\beta}=\frac{2}{1-P^2}$

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43. Solve :

$$\sqrt{2\cos^2 x + 1} + \sqrt{2\sin^2 x + 1} = 2\sqrt{2}$$

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44. Exhibit graphically the solution region of the following system of 'inequations :

$2x + y \geq 4$,$x + y \leq 3$,$2x - 3y \leq 6$,x>0,y>0

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45. If the roots of the equation $qx^2 + 2px + 2q = .0$ are real and unequal then prove that the roots of the equation $(p+q)x^2 + 2qx + (p-q) = 0$are imaginary,

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46. Solve:$6x^2 - (18+5i)x + 18 + i = 0$

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47. Out of 17 comodities 12 are same type and 5 are different type. Find the number of combinations if 13 comodities are taken at a time.

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48. Show that $x = ay^2 + by + c$ represents the equation of a parabola. Find the co-ordinate of its vertex and also find the length of its latus rectum

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49. Find the following things of an ellipse $9x^2 + 4y^2 + 18x - 16y = 11$, co-ordinates of. centre, co-ordinates of foci, equation of directrices, length of latus rectum and eccentricity.

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50. If S, S' are the foci and' P any point on the rectangular hyperbola$x^2 - y^2 = a^2$, prove

that, $\overline{SP}.\overline{S'P} = CP^2$ where C is the centre of the hyperbola

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