

தமிழ்நாடு மாநிலப் பேரீழை - 2014-15

மத்தியம் கல்வியியல் - கணிதம்

I. சரியான விடையைத் தேர்ந்தெடுக்கவும் :

1. க) 10	2. ஈ) A.P. & G.P	3. க) k^2	4. க) $\frac{b^2}{4a}$	5. க) $a = c$
6. ஈ) $\begin{pmatrix} 4 & -2 \\ 6 & -3 \end{pmatrix}$	7. க) (1, 7)	8. க) -1	9. க) 3.2	10. க) 1505.6
11. க) $25\sqrt{36}$	12. ஈ) -9	13. க) 4:3	14. க) 25	15. க) 1

II. கீழ்க்கண்டவற்றின் விடையைக் காண்க (ஒவ்வொன்றுக்கும் 4 மதிப்பு, மொத்தம் 30 மதிப்புகள் உள்ளன)

16.
 $A \cup B = \{a, x, y, r, s, 1, 3, 5, 7, -10\}$
 $B \cup A = \{a, x, y, r, s, 1, 3, 5, 7, -10\}$

17.
 2 இட முன்பு 26 = 12 மணிக்கு 14
 3 இட முன்பு 26 = 13 மணிக்கு 15

18.
 $\frac{x^3}{x-2} - \frac{8}{x-2}$
 $= \frac{(x-2)(x^2+2x+4)}{(x-2)} = x^2 + 2x + 4$

19. $AB = \begin{pmatrix} -36 & 48 \\ -49 & 25 \end{pmatrix}$
 AB இன் பின்வரும் எதிர்மாறு = $\begin{pmatrix} 36 & -48 \\ 49 & -25 \end{pmatrix}$

20.
 $6A - 3B = \begin{pmatrix} 24 & -12 \\ 30 & -54 \end{pmatrix} - \begin{pmatrix} 24 & 6 \\ -3 & -9 \end{pmatrix}$
 $= \begin{pmatrix} 0 & -18 \\ 33 & -45 \end{pmatrix}$


21.
 சரிவின் $(m_1) = -\frac{3}{2}$
 சரிவின் $(m_2) = -\frac{6}{4} = -\frac{3}{2}$
 $\therefore m_1 = m_2$

22. $y = mx$

23. $PA \times PB = PC \times PD$
 $x = \frac{8 \times 3}{4} = 6$

24.
 $\sin^6 \alpha + \cos^6 \alpha = (\sin^2 \alpha)^3 + (\cos^2 \alpha)^3$
 $= (\sin^2 \alpha + \cos^2 \alpha)^3 - 3 \sin^2 \alpha \cos^2 \alpha$
 $(\sin^2 \alpha + \cos^2 \alpha)$
 $= 1 - 3 \sin^2 \alpha \cos^2 \alpha$

25. $\triangle CAB$ இல்
 $\sin 30^\circ = \frac{h}{200}$
 $h = 200 \times \frac{1}{2} = 100$ மீ.



26. விட்டம் $2r = 7$ மீ
 கோளத்தின் கனம்
 $= 4\pi r^3$
 $= \pi (2r)^3$
 $= \frac{22}{7} \times 7^3 = 154$ ச.மீ.³

27. சரிவின் உகமையின் கனம் $= \pi r^2 h$
 $= \frac{22}{7} \times 14 \times 14 \times 30$
 $= 44 \times 14 \times 30 = 18480$ ச.மீ.³

28. $C.V = \frac{\sigma}{\bar{x}} \times 100$
 $57 = \frac{6.84}{\bar{x}} \times 100$
 $\bar{x} = \frac{6.84 \times 100}{57} = 12$

<p>29. $n(S) = 35$ $n(A) = 35 - 7 = 28$ $P(A) = \frac{28}{35} = \frac{4}{5}$</p>	<p>30. $t_n = a + (n-1)d$ $t_{17} = 4 + 16(5) = 4 + 80 = 84$</p>	<p>31) $3x + 4y = -25 \quad \text{--- (1) } \times 2$ $2x - 3y = 6 \quad \text{--- (2) } \times (-3)$ <hr/> $6x + 8y = -50 \quad \text{--- (3)}$ $3x + 4y = -18 \quad \text{--- (4)}$ --- (3) - (4) $4y = -68$ $\therefore y = -17, x = -3$</p>
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|| 5 ప్రాతినిధ్యం కలిగినది (ప్రతిభాగాల సంఖ్య, ఆ-కలనం ద్వారా)

<p>31. $R \subseteq A \times B$ $f \subseteq A \times B$ $f \text{ ఆ ఒక ప్రాతినిధ్యం } = A, (x, y) \in f$ $x \in A, y \in B.$</p>	<p>32. $B \cap C = \{4, 5, 6\}$ $A \cup (B \cap C) = \{-3, -1, 0, 4, 5, 6, 8, 10\} \text{--- (1)}$ $A \cup B = \{-3, -2, -1, 0, 4, 5, 6, 8, 10\}$ $A \cup C = \{-3, -1, 0, 1, 2, 3, 4, 5, 6, 7, 8, 10\}$ $(A \cup B) \cap (A \cup C) = \{-3, -1, 0, 4, 5, 6, 8, 10\}$ --- (2) --- (1) = (2)</p>
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<p>33. $S_n = 104 + 112 + \dots + 992$ $a = 104, d = 8, l = 992$ $n = \frac{l - a}{d} + 1 = \frac{992 - 104}{8} + 1 = 112$ $S_{112} = \frac{112}{2} [104 + 992] = 61376$</p>	<p>34. $\begin{array}{r} x^2 - 2x + 3 \\ x^4 - 4x^3 + 10x^2 - 12x + 9 \\ \hline x^4 \\ \hline -4x^3 + 10x^2 \\ -4x^3 + 4x^2 \\ \hline 6x^2 - 12x + 9 \\ 6x^2 - 12x + 9 \\ \hline 0 \end{array}$ $= (x^2 - 2x + 3)$</p>
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<p>35. $a = p, b = q, c = r$ $b^2 - 4ac = 0$ $q^2 - 4(p)(r) = 0$ $q^2 - 4pr = 0$ $q^2 = 4pr$</p>	<p>36. $x^2 - 2x^2 - 5x + 6$ $\begin{array}{r rrrr} 1 & -2 & -5 & 6 \\ & 0 & 1 & -1 & -6 \\ \hline & 1 & -1 & -6 & 0 \end{array} \quad (x-1) \text{ గా } \text{భాగించండి.}$ $P(x) = (x-1)(x^2 - x - 6)$ $= (x-1)(x-3)(x+2)$</p>
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<p>37. $A(-2, -1) B(4, 0) C(2, 3) D(-3, 4)$ AB యొక్క భ్రమ = $\frac{1}{b}$ CD యొక్క భ్రమ = $\frac{1}{b}$ BC యొక్క భ్రమ = -3 AD యొక్క భ్రమ = -3 $AB \parallel CD, BC \parallel AD \therefore ABCD$ ఒక దీర్ఘచతురస్రం.</p>	<p>38. AC యొక్క భ్రమ $y = \frac{5+4}{-1-2} = \frac{9}{-3} = -3$ BD యొక్క భ్రమ $= +\frac{1}{3}$ BD యొక్క భ్రమ $y - 3 = \frac{1}{3}(x - 3)$ $x - 3y + 6 = 0.$</p>
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10. ΔABC ,
 2nd part
 3rd part
 $\frac{AD}{DB} = \frac{AE}{EC}$

11. $(\sin\alpha + \operatorname{cosec}\alpha)^2 + (\cos\alpha + \operatorname{sec}\alpha)^2$
 $= \sin^2\alpha + \operatorname{cosec}^2\alpha + \cos^2\alpha + \operatorname{sec}^2\alpha + 2\sin\alpha \cdot \frac{1}{\sin\alpha} + 2\cos\alpha \cdot \frac{1}{\cos\alpha}$
 $= 1 + (1 + \cot^2\alpha) + (1 + \tan^2\alpha) + 2 + 2$
 $= 7 + \tan^2\alpha + \cot^2\alpha$

12. $\frac{1}{3}\pi r^2 h = \pi r^2 h$
 $\frac{1}{3}\pi \times 18 \times 18 \times 32 = \pi \times 18 \times 18 \times 32$
 $r^2 = \frac{18 \times 18 \times 32}{8} = 1296$
 $r = 36$
 $l = \sqrt{h^2 + r^2} = 12\sqrt{13}$

13. $\sin\alpha = \frac{90}{5} = 18$
 $2d = 0$; $2d^2 = 98$
 $\sigma = \sqrt{\frac{2d^2}{n}} = \sqrt{\frac{98}{5}} = \sqrt{19.6}$
 ≈ 4.427
 C.V. = $\frac{\sigma}{\bar{x}} \times 100$
 $= \frac{4.427}{18} \times 100 = 24.6$

14. $n(S) = 52$
 $P(A) = \frac{4}{52}$; $P(B) = \frac{13}{52}$; $P(C) = \frac{26}{52}$
 $P(A \cap B) = \frac{1}{52}$; $P(B \cap C) = \frac{13}{52}$; $P(A \cap C) = \frac{2}{52}$
 $P(A \cap B \cap C) = \frac{1}{52}$
 $P(A \cup B \cup C) = \frac{7}{13}$

15. $11^2 + 12^2 + 13^2 + \dots + 24^2$
 $(1^2 + 2^2 + \dots + 24^2) - (1^2 + 2^2 + \dots + 10^2)$
 $= \frac{24 \times 25 \times 49}{6} - \frac{10 \times 11 \times 21}{6}$
 $= 4900 - 385 = 4515$

15. $\pi [R^2 h - r^2 h]$
 $= \pi [3 \times 3 \times 280 - 1 \times 1 \times 280]$
 $= \frac{22}{7} [2520 - 280]$
 $= \frac{22}{7} \times 2240 = 7040 = 7.04 \text{ cm}^3$

16. $PA = PB = 12 \text{ cm}$
 17. ΔABC

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