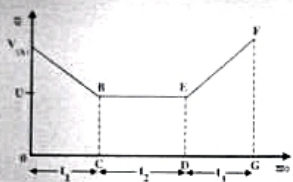


93. (a)



$$OABC \square = d; BCDE \square = 2d; DEFG \square = 3d$$

මෙය දී ඇත.

සමස්ත කම්පන කාලයට දිශා පරිණාමය වන කාලය = $\frac{6d}{V}$

→ ප්‍රවේගය කාලය ප්‍රතිශතය වන කාලය = $\frac{6d}{V}$

$$\frac{1}{2}(V+U)t_1 = d; U \times t_2 = 2d; \frac{1}{2}(U+V)t_3 = 3d$$

$$t_1 = \frac{2d}{V+U}; t_2 = \frac{2d}{U}; t_3 = \frac{6d}{U+V}$$

විශේෂ දිශාපරිණාමය වන කාලය = $t_1 + t_2 + t_3$

$$= \frac{2d}{V+U} + \frac{2d}{U} + \frac{6d}{U+V}$$

$$= \frac{2d}{U(V+U)} [U(V+U) + U^2 + 3U(V+U)]$$

$$= \frac{2d(5U+V)}{U(V+U)}$$

$$\text{මෙම අගයය සිදුකරන ප්‍රතිඵලය} = \frac{2d(5U+V)}{U(V+U)} \cdot \frac{6d}{V}$$

$$= \frac{2d}{UV(V+U)} [5UV + V^2 + 3U^2 + 3UV]$$

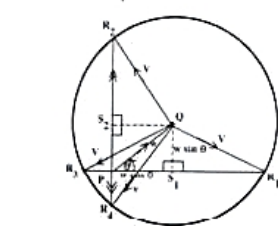
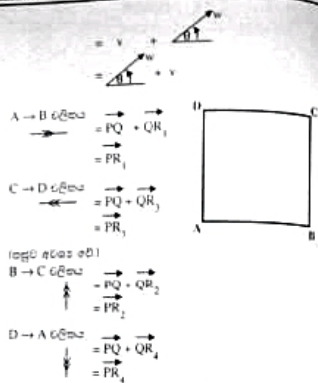
$$= \frac{2d}{UV(V+U)} [V^2 + 2UV + 3U^2]$$

$$= \frac{2d}{UV(V+U)} (V+3U)(V+U)$$

(b) (සමාන) = v

$$\text{(සමාන)} = \frac{v}{2}$$

$$\text{(සමාන)} = \text{(සමාන)} + \text{(සමාන)}$$



$$A \rightarrow B \text{ කාලය } t_1 \text{ නම් } t_1 = \frac{d}{|PQ|}$$

$$C \rightarrow D \text{ කාලය } t_3 \text{ නම් } t_3 = \frac{d}{|RS|}$$

$$t_1 + t_3 = \frac{d}{|PQ|} + \frac{d}{|RS|}$$

$$= \frac{d}{(S_1 R_1 + PS_1)} + \frac{d}{(S_3 R_3 + PS_3)}$$

$$= \frac{d}{(S_1 R_1 + PS_1)} + \frac{d}{(S_3 R_3 + PS_3)}$$

$$= \frac{d(S_1 R_1 + PS_1 + S_3 R_3 + PS_3)}{(S_1 R_1 + PS_1)(S_3 R_3 + PS_3)}$$

$$= \frac{d(S_1 R_1 + PS_1 + S_3 R_3 + PS_3)}{(S_1 R_1 + PS_1)(S_3 R_3 + PS_3)}$$

$$= \frac{d(S_1 R_1 + PS_1 + S_3 R_3 + PS_3)}{(S_1 R_1 + PS_1)(S_3 R_3 + PS_3)}$$

$$= \frac{2aS_1 R_1}{S_1 R_1 + PS_1} = \frac{2a \sqrt{v^2 - w^2 \sin^2 \theta}}{v^2 - w^2 \sin^2 \theta - w^2 \cos^2 \theta}$$

$$t_1 + t_3 = \frac{2a \sqrt{v^2 - w^2 \sin^2 \theta}}{v^2 - w^2}$$

B → C නම් D → A දිශාවට චලිත වන කාලය t_2 හා t_4

නම් $t_2 + t_4$ කාලය අනෙකුත් ප්‍රතිඵලය 0 වෙලාවට $\frac{\pi}{2}$ වේ

කෙටිකෙටි අනෙකුත් කාලය t_2 $QR_2 = \pi/2 - \theta$

$$t_2 + t_4 = \frac{2a \sqrt{v^2 - w^2 \sin^2 (\pi/2 - \theta)}}{(v^2 - w^2)}$$

ප්‍රතිඵලය අනෙකුත් කාලය t_2 නම්

$$T = t_1 + t_2 + t_3 + t_4 = \frac{2a \sqrt{v^2 - w^2 \sin^2 \theta}}{(v^2 - w^2)}$$

$$+ \frac{2a \sqrt{v^2 - w^2 \cos^2 \theta}}{(v^2 - w^2)}$$

$$T = \frac{2a}{(v^2 - w^2)} [\sqrt{v^2 - w^2 \sin^2 \theta} + \sqrt{v^2 - w^2 \cos^2 \theta}]$$

$$= \frac{2a}{(v^2 - w^2)} [\sqrt{v^2 - w^2 \sin^2 \theta} + \sqrt{v^2 - w^2 \cos^2 \theta}]$$

$$= \frac{2a}{(v^2 - w^2)} [\sqrt{v^2 - w^2 \sin^2 \theta} + \sqrt{v^2 - w^2 \cos^2 \theta}]$$

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$$= \frac{2a}{(v^2 - w^2)} [\sqrt{v^2 - w^2 \sin^2 \theta} + \sqrt{v^2 - w^2 \cos^2 \theta}]$$

92. (a) (සමාන) = a_1

$$\text{(සමාන)} = \frac{a^2}{2}$$

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08. (a) I. A හා B සිදු වන සම්භාවිතය සොයන්න.
 $P(A \cap B) = P(A) \cdot P(B)$ බවයි.

II. A හා B සිදු වන අනෙකුත් සම්භාවිතය සොයන්න.
 $A \cap B = \emptyset$, එනම් $P(A \cap B) = 0$ බවයි.

III. A හා B සිදු වන සම්භාවිතය සොයන්න.
 $A \cup B = \Omega$ (සියලුම අවස්ථා) බවයි.
එනම් $P(A \cup B) = 1$ බවයි.

A හා B සිදු වන අනෙකුත් සම්භාවිතය සොයන්න.
සිදු වන බවයි.

$$P[(A \cap B) \cup (A \cap B)^c] = P(A \cap B) + P(A \cap B)^c = 1$$

$$\therefore P(A) = P(A \cap B) + P(A \cap B)^c$$

$$P(A) = P(A \cap B) + P(A \cap B)^c$$

$$P(A) = P(A \cap B) + P(A \cap B)^c$$

$$P(A) = P(A \cap B) + P(A \cap B)^c$$

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$$P(A) = P(A \cap B) + P(A \cap B)^c$$

$$P(A) = P(A \cap B) + P(A \cap B)^c$$

$$P(Z) = \frac{19}{28} \quad \therefore P(Z) = \frac{9}{28} \quad (\because Z \cup Z^c = \Omega)$$

$$P(Z|Y) = \frac{1}{4} \quad \therefore P(Z|Y) = \frac{1}{4}$$

$$P(Z|X) = 2(Z|Y) \text{ බව දී ඇත}$$

$$\therefore P(Z|X) = 2 \times \frac{1}{4} = \frac{1}{2}$$

I. සියලුම සම්භාවිතය සොයන්න.

$$P(Z) = P(X \cap Z) + P(Y \cap Z)$$

$$= P(X) \times P(Z|X) + P(Y) \times P(Z|Y)$$

$$= \left(\frac{1}{2} \times \frac{1}{2}\right) + \left(\frac{1}{4} \times \frac{1}{4}\right)$$

$$= \frac{1}{4} + \frac{1}{16} = \frac{5}{16}$$

$$\therefore P(Z) = \frac{5}{16}$$

$$\frac{9}{28} = \frac{1}{2} \times \frac{1}{2} + \frac{1}{4} \times \frac{1}{4}$$

$$\frac{9}{28} = \frac{1}{4} + \frac{1}{16}$$

$$\frac{9}{28} = \frac{5}{16}$$

$$\frac{9}{28} = \frac{5}{16}$$

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$$\frac{9}{28} = \frac{5}{16}$$

08. $x_1, x_2, \dots, x_n$ දත්තයන්ගේ සාමාන්‍යය $\bar{x} = \frac{1}{n} \sum_{i=1}^n x_i$

$$y_i = ax_i + b \text{ බව දී ඇත}$$

$$\sum_{i=1}^n y_i = \sum_{i=1}^n (ax_i + b)$$

$$= \sum_{i=1}^n ax_i + \sum_{i=1}^n b$$

$$= a \sum_{i=1}^n x_i + b \sum_{i=1}^n 1$$

$$= a n \bar{x} + b n$$

$$y_1, y_2, \dots, y_n \text{ දත්තයන්ගේ සාමාන්‍යය } \bar{y} = \frac{1}{n} \sum_{i=1}^n y_i \text{ බවයි}$$

$$\bar{y} = \frac{1}{n} (a n \bar{x} + b n)$$

$$\bar{y} = a \bar{x} + b \quad \text{--- ①}$$

$y_1, y_2, \dots, y_n$ දත්තයන්ගේ සම්මත අපරිමාව

$$= \sqrt{\frac{1}{n} \sum_{i=1}^n (y_i - \bar{y})^2}$$

$$= \sqrt{\frac{1}{n} \sum_{i=1}^n [ax_i + b - (a\bar{x} + b)]^2}$$

$$= \sqrt{\frac{1}{n} \sum_{i=1}^n (ax_i + b - a\bar{x} - b)^2}$$

$$= \sqrt{\frac{1}{n} \sum_{i=1}^n a^2 (x_i - \bar{x})^2}$$

$$= a \sqrt{\frac{1}{n} \sum_{i=1}^n (x_i - \bar{x})^2}$$

$x_1, x_2, \dots, x_n$ දත්තයන්ගේ සම්මත අපරිමාව

$$S_x = \sqrt{\frac{1}{n} \sum_{i=1}^n (x_i - \bar{x})^2} \text{ බවයි}$$

$$\therefore S_y = a S_x$$

$$S_y = a S_x \quad \text{--- ②}$$

$y_1, y_2, \dots, y_n$ දත්තයන්ගේ සාමාන්‍යය $\bar{y}$ සොයන්න.

$$\bar{y} = a \bar{x} + b \quad \text{--- ①}$$

$$40 = 40a + b \quad \text{--- ②}$$

$$\text{① හි } 50 = am + b \quad \text{--- ③}$$

$$\text{② හි } 15 = 12a + b \quad \text{--- ④}$$

$$\text{③ හි } 50 = 40a + b \quad \text{--- ⑤}$$

$$\text{④ හි } 10 = a(m - 40) \quad \text{--- ⑥}$$

$$a = \frac{1}{4} \text{ බවයි}$$

$$m = 48 \text{ බවයි}$$

$$\text{එම නිසා } 10 = a(m - 40) \quad \text{--- ⑦}$$

$$56 = 61a + b \quad \text{--- ⑧}$$

$$50 = 53a + b \quad \text{--- ⑨}$$

$$15 = 12a + b \quad \text{--- ⑩}$$

$$\text{⑧ හි } 6 = 8a \quad \text{--- ⑪}$$

$$a = \frac{3}{4} \text{ බවයි}$$

$$\therefore S = 20$$

$$\text{අවසානයේ } S = 20 \text{ බවයි}$$

$$\text{අවසානයේ } S = 20 \text{ බවයි}$$

$$\text{අවසානයේ } S = 20 \text{ බවයි}$$

$$\text{අවසානයේ } S = 20 \text{ බවයි}$$

$$\text{අවසානයේ } S = 20 \text{ බවයි}$$

$$\text{අවසානයේ } S = 20 \text{ බවයි}$$

$$\text{අවසානයේ } S = 20 \text{ බවයි}$$

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$$\text{අවසානයේ } S = 20 \text{ බවයි}$$

$$\text{අවසානයේ } S = 20 \text{ බවයි}$$

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$$\text{අවසානයේ } S = 20 \text{ බවයි}$$

$$\text{අවසානයේ } S = 20 \text{ බවයි}$$