

1) b) $P(A) = P(A, B)$
 $= n$
 2) d) 6
 3) b) $1/2 \sigma$
 4) a) $100 - 3x^2$
 5) b) $-\cos 2x + C$
 6) c) 1
 7) d) 1 க்கான பதில் 3
 8) $x = ce^{-py}$
 9) c) 1
 10) b) 1
 11) c) $1 + \Delta$
 12) b) $2x + 3$
 13) c) $2 = \frac{x-9}{9}$
 14) c) $496/729$
 15) d) $\frac{1}{3}$
 16) c) 2
 17) a) $\frac{1}{3}$
 18) c) σ/\sqrt{n}
 19) c) 10 or 0
 20) c) $\frac{1}{E}$

21) $\Delta = 1$
 $\Delta x = 8$
 $\Delta y = -3$
 $\therefore x = 8, y = -3$
 22) $\left[\frac{x^4}{4} + \frac{7x^3}{3} - \frac{5x^2}{2} \right]$
 $= \frac{1}{4} + \frac{7}{3} - \frac{5}{2}$
 $= 1/12$
 23) $c'(x) = \frac{x^2}{200} + 4$
 $c = \frac{x^3}{600} + 4x + k$
 $x = 0, c = 0$ எனில் $k = 0$
 $x = 200$
 $c = 14133.33$
 24) $\sigma = 10$
 $\sigma.E = 3$
 $\sigma = 30$
 $\nabla f(x) = f(x) - E^{-1} f(x)$
 $\nabla f(x) = f(x) (1 - E^{-1})$
 $\nabla = 1 - \frac{1}{E} = \frac{E-1}{E}$
 $\nabla = \frac{E-1}{E}$

25) $E(x) = \int_{-\infty}^{\infty} f(x) dx$
 $= \int_0^1 2x^2 dx$
 $= 2/3$
 $E(x) = 2/3$
 26) $p = 5\% = 0.05$
 $q = 0.95$
 $n = 20$
 $x = 4$
 $P(x=4) = {}^{20}C_4 (0.05)^4 (0.95)^{16}$
 $= 0.0133$
 27) $\sigma = 10, SE = 3$
 $n = ?$
 $SE = \sigma/\sqrt{n}$
 $n = (10/3)^2$
 $= 11.11 \approx 11$
 $n = 11$
 28) $\Sigma P_0 q_0 = 425$
 $\Sigma P_0 q_1 = 550$
 $\Sigma P_1 q_0 = 1150$
 $\Sigma P_1 q_1 = 1450$
 1) $P_{01} = \frac{1150}{425} \times 100 = 270.59$
 2) $P_{01} = \frac{1450}{425} \times 100 = 263.64$

30) $\frac{dy}{y} = \sin 2x dx$
 $\int \frac{dy}{y} = \int \sin 2x dx$
 $\log y = -\frac{\cos 2x}{2} + C$
 31) $21 + 7k = 0$
 $k = -3$
 32) $\int \frac{e^{3x}(1+e^{2x})}{e^x(1+e^{2x})} dx$
 $= \int e^{4x} dx$
 $= \frac{e^{4x}}{4} + C$
 33) $y^2 = 4ax$
 $y = 2\sqrt{a}\sqrt{x}$
 $u = y = 2\sqrt{a}\sqrt{x}$
 $u du = 2 \int y dx$
 $= 2 \times 2\sqrt{a} \int x^{1/2} dx$
 $= 4\sqrt{a} \frac{x^{3/2}}{3/2}$
 $= \frac{8}{3} a^2 \sigma$
 34) $x \frac{dy}{dx} + 2y = x^4$
 $x \frac{dy}{dx} + 2y = x^4$
 $\frac{dy}{dx} + \frac{2y}{x} = x^3$
 $P = 2/x, Q = x^3$

$\int p dx = \int 2/2 dx$
 $= 2 \log x$
 $= \log x^2$
 $I.F = e^{\int p dx} = e^{\log x^2} = x^2$
 $\therefore y x^2 = \int x^2 \cdot x^2 dx$
 $y x^2 = x^6/6 + C$
 35) $\Delta^4 y_0 = 0$
 $-4y_3 + 124 = 0$
 $y_3 = 31$
 36) $p = 1/80, n = 30$
 $\lambda = np = 0.375$
 $P(x) = \frac{e^{-\lambda} \lambda^x}{x!}$
 $P(x > 2)$
 $= 1 - [P(x=0) + P(x=1) + P(x=2)]$
 $= 1 - e^{-0.375} (1 + 0.375)$
 $= 1 - 0.6873 \times 1.375$
 $= 0.055$
 SUCCESS TUITION
 CIVILASST

37) $n = 400$
 $P = 230/400$
 $= 0.575$
 $Q = 1 - P = 0.425$
 $SE = \sqrt{\frac{PQ}{n}} = 0.025$
 38) Full Mark
 39) (27, 25, 23, 32)
 1888
 $= 23$
 E_3 க்கான பதில்
 22
 40) $x = 2, 4, 6, 8$
 $P(x) = 2k, 4k, 6k, 8k$
 $\Sigma P(x) = 1$
 $2k + 4k + 6k + 8k = 1$
 $18k = 1$
 $k = 1/18$
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1) a) $\begin{pmatrix} 5 & 3 & 7 & 4 \\ 2 & 2 & 2 & 9 \\ 7 & 2 & 10 & 5 \end{pmatrix}$

2) a) $2I = \int dx$
 $2I = (x)^{1/2}$
 $2I = \pi/2$
 $I = \pi/4$

$P = 10x - \frac{x^2}{100} - 200$
 $\frac{dP}{dx} = 10 - \frac{2x}{100}$
 $\frac{dP}{dx} = 0 \Rightarrow x = 500$

So is
 $y = e^{-x} - \frac{3e^{-2x}}{2} + \frac{e^{-3x}}{2}$

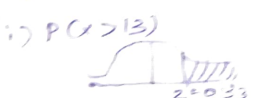
15) a) $f(0) = 12$
 $f(1) = 3$

$\begin{pmatrix} 5 & 3 & 7 & 4 \\ 0 & 11 & -1 & 3 \\ 0 & 0 & 0 & 0 \end{pmatrix}$

x	y	$\frac{x-y}{1994}$	x^2	xy	$\frac{y}{x}$
1992	46	-2	4	-92	118
1993	48	-1	1	-48	168
1994	42	0	0	0	188
1995	56	1	1	56	58
1996	52	2	4	104	52.8
	344	0	10	20	

$P = 10(500) - \frac{(500)^2}{100} - 200$
 $= 2300$

14) a) $X = 2000$ -1000
 $P(x) = 0.4 \quad 0.6$



$P(A) = 2, P(A|B) = 2 < 3$
 let $z = k$
 $11y - z = 3$
 $11y = 3 + k$
 $y = \frac{3+k}{11}$

$a = \frac{\sum y}{n} = \frac{244}{5} = 48.8$
 $b = \frac{\sum xy}{\sum x^2} = \frac{20}{10} = 2$
 $y = a + bx$
 $= 48.8 + 2x$

b) $(D^2 - 3D + 2)y = e^{3x}$
 $m^2 - 3m + 2 = 0$
 $m = 1, m = 2$
 $CF = Ae^x + Be^{2x}$
 $PI = \frac{e^{3x}}{D^2 - 3D + 2}$
 $= \frac{e^{3x}}{2}$

$E(X) = \sum x P(x)$
 $= 800 - 600 = 200$

$z = \frac{x - \mu}{\sigma} = \frac{0 - 333}{6}$
 $P(z > 0.333)$
 $= 0.5 - 0.1292$
 $= 0.3707$

$5x + 3y + 7z = 4$
 $x = \frac{7 - 16k}{11}$
 Solution:
 $x = \frac{7 - 16k}{11}, y = \frac{3 + k}{11}$
 $z = k, k \in R$

43) a) $R(x) = \int (50 + \frac{x}{50}) dx + k_1$
 $= 50x + \frac{x^2}{100} + k_1$
 $k_1 = 200$
 $R'(x) = 60$
 $R(x) = 60x + \frac{x^2}{2} + 200$
 $k_2 = 0$

So $y = CF + PI$
 $= Ae^x + Be^{2x} + \frac{e^{3x}}{2}$
 $x = 0, y = 0$
 $2A + 2B = -1$
 $x = \ln 2, y = 0$
 $2A + 4B = -4$
 $A = 1, B = -3/2$

$E(x^2) = 1600000 + 600000$
 $= 2200000$
 $V(x) = E(x^2) - (E(x))^2$
 $= 2200000 - 4000$
 $= 2160000$
 $\sigma = 1469.69$

$P(z > 0.333)$
 $= 0.3707$
 $125 \times 0.3707 = 46.3$

b) $y = \frac{(x-x_1)(x-x_2) \dots y_0}{(x_0-x_1)(x_0-x_2) \dots}$
 $= \frac{1}{6}(12) - \frac{13}{3} + \frac{5(14)}{6}$
 $+ \frac{4 \times 16}{12}$
 $= 14.6663$

Annual $P = 60x - 50x - \frac{x^2}{100} - 200$
 $A = 1, B = -3/2$

b) $T = \begin{pmatrix} 0.8 & 0.2 \\ 0.7 & 0.3 \end{pmatrix}$
 $(60 \ 40) \begin{pmatrix} 0.8 & 0.2 \\ 0.7 & 0.3 \end{pmatrix} = (76 \ 24)$
 $(76 \ 24) \begin{pmatrix} 0.8 & 0.2 \\ 0.7 & 0.3 \end{pmatrix} = (77.6 \ 22.4)$
 Maths $\rightarrow 78\%$
 English $\rightarrow 22\%$

ii) $P(x < 5)$

 $z = -2.333$
 $P(z < -2.333)$
 $= 0.5 - 0.4901$
 $= 0.0099$
 $= 125 \times 0.0099$
 $= 1.2375$

iii) $P(9 < X < 14)$

 $= P(0 < z < 1) + P(0 < z < 2.667)$
 $= 0.3413 + 0.2486$
 $= 0.5899$
 $= 125 \times 0.5899$
 $= 73.7375$

45) b) $\Sigma P_0 Q_0 = 1560$
 $\Sigma P_0 Q_1 = 1344$
 $\Sigma P_1 Q_0 = 2140$
 $\Sigma P_1 Q_1 = 1880$

$P_{01} \times P_{10} = 1$
 $P_{01} \times Q_{01} = \frac{1880}{1560}$
 $= \frac{\Sigma A Q_1}{\Sigma P_0 Q_0}$

46) a) $\int x^n \log x dx$
 $u = \log x \quad dv = x^n dx$
 $du = \frac{1}{x} dx \quad v = \frac{x^{n+1}}{n+1}$
 $\int u dv = uv - \int v du$
 $= \frac{x^{n+1}}{n+1} \log x - \int \frac{x^{n+1}}{n+1} \cdot \frac{1}{x} dx$
 $= \frac{x^{n+1}}{n+1} \log x - \frac{1}{n+1} \int x^n dx$

$= \frac{x^{n+1}}{n+1} \log x - \frac{1}{n+1} \left(\frac{x^{n+1}}{n+1} \right) + C$
 $= \frac{x^{n+1}}{n+1} \left[\log x - \frac{1}{n+1} \right] + C$

b) $n = 100$
 $\Sigma x = 3.5$
 $M = 4$
 $H_0: M = 4$
 $H_1: M \neq 4$
 $Z_\alpha = 0.05$
 $Z = \frac{\bar{x} - \mu}{\frac{\sigma}{\sqrt{n}}} = \frac{3.5 - 4}{\frac{3}{\sqrt{100}}} = \frac{-0.5}{0.3} = -1.667$
 $|Z| = 1.667$

பெரிய எண்ணிக்கை $n = 100$
 மாதிரி எண்ணிக்கை $M = 4$
 $H_0: M = 4$
 $H_1: M \neq 4$
 $Z_\alpha = 0.05$
 $Z = \frac{\bar{x} - \mu}{\frac{\sigma}{\sqrt{n}}} = \frac{3.5 - 4}{\frac{3}{\sqrt{100}}} = \frac{-0.5}{0.3} = -1.667$
 $|Z| = 1.667$
 சிபிசென்னை டெபிசென்னை 1.96
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 சிபிசென்னை சிபிசென்னை 1.96
 \therefore சிபிசென்னை சிபிசென்னை 1.96
 H_0 : சிபிசென்னை சிபிசென்னை 1.96

47) a)

	I	II	III	IV
A	8	0	7	1
B	8	3	0	3
C	1	1	8	0
D	0	5	1	2

A \rightarrow II \rightarrow 12
 B \rightarrow III \rightarrow 7
 C \rightarrow IV \rightarrow 11
 D \rightarrow I \rightarrow 8
 $\Sigma = 38$
 சிபிசென்னை சிபிசென்னை $= 38$

b) $\frac{dy}{dx} = \frac{x-y}{x+y}$
 Let $y = vx$
 $\frac{dy}{dx} = v + x \frac{dv}{dx}$
 $v + x \frac{dv}{dx} = \frac{x - vx}{x + vx}$
 $x \frac{dv}{dx} = \frac{1-v}{1+v} - v$
 $x \frac{dv}{dx} = \frac{1-2v-v^2}{1+v}$

$\frac{1+v}{v^2+2v-1} dv = \frac{-dx}{x}$
 $\frac{2+2v}{v^2+2v-1} dv = \frac{-2dx}{x}$
 $\int \frac{2+2v}{v^2+2v-1} dv = \int \frac{-2dx}{x}$
 $\Rightarrow \log(v^2+2v-1) = -2 \log x + \log c$
 $v^2+2v-1 = c x^{-2}$
 $x^2(v^2+2v-1) = c$
 put $v = y/x$
 $x^2 \left(\frac{y^2}{x^2} + \frac{2y}{x} - 1 \right) = c$
 $y^2 + 2yx - x^2 = c$

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