Answer keys

1	A	**2**	D	**3**	C	**4**	D	**5**	A	**6**	D	**7**	C
8	C	**9**	D	**10**	B	**11**	D	**12**		**13**	D	**14**	A
15	C	**16**	A	**17**	D	**18**	A	**19**	C	**20**	D	**21**	
22	C	**23**	A	**24**	A	**25**	C	**26**	A	**27**	C	**28**	A
29	A	**30**	A/C	**31**	B	**32**	A	**33**		**34**		**35**	
36	A	**37**		**38**		**39**	D	**40**	A	**41**	C	**42**	C
43	B	**44**	B	**45**	D	**46**	D	**47**	A	**48**	D	**49**	
50	A	**51**	C	**52**	C	**53**	D	**54**		**55**	B	**56**	D
57	C	**58**	B	**59**		**60**		**61**		**62**	D	**63**	
64	B	**65**	C	**66**	B	**67**		**68**	D	**69**	C	**70**	
71	B	**72**	B	**73**	C	**74**	B	**75**	C	**76**	D	**77**	
78		**79**		**80**	B	**81**	C	**82**		**83**		**84**	A
85													

Explanation:

3. The system will have unique solution if $\det A \neq 0$ where $A = \begin{bmatrix} 1 & 1 & 2 \\ 1 & 2 & 3 \\ 1 & 4 & \alpha \end{bmatrix}$

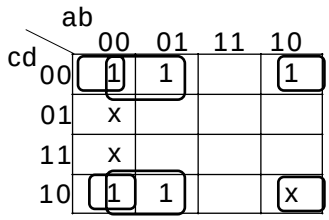
$\det A \neq 0 \Rightarrow \alpha - 5 \neq 0 \Rightarrow \alpha \neq 5$

$\therefore$ α could be any real number except 5

4.

Exponent	Fraction	Number
All zero	All zero	Positive or negative zero

5.



22. $x = \sqrt[2]{R}$

$\therefore\ x^2 - R = 0$

$f(x) = x^2 - R$

$f'(x) = 2x$

$$x_{n+1} = x_n - \frac{f(x_n)}{f'(x_n)} = x_n - \frac{x_n^2 - R}{2x_n} = \frac{1}{2}\left(x_n + \frac{R}{x_n}\right)$$

25. $f(x) = 3x^4 - 16x^3 + 24x^2 + 37$

$f'(x) = 12x^3 - 48x^2 + 48x$

$f'(x) = 0$

$\Rightarrow x^3 - 4x^2 + 4x = 0$

$\Rightarrow x(x-2)^2 = 0$

$\therefore\ x = 0, 2, 2$

26. $(P + \bar{Q})(P.\bar{Q} + P.R)(\bar{P}.\bar{R} + \bar{Q})$

$= (P + Q)(P.Q + P.R.\bar{Q})$

$= (P + Q)(P.\bar{Q})\ \ [\because\ (1 + R) = 1]$

$= P\bar{Q}$

27. The required probability $= .4 \times .4 + .6 \times .4 = .40$

28. λ : eigen value

$\lambda^2 - \text{trace}(A) + \det(A) = 0, \quad \lambda = 1$

$\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} : 1 - 2 + 1 = 0$

$\begin{bmatrix} 0 & 1 \\ 0 & 0 \end{bmatrix} : 1 - 0 + 0 \neq 0$

$\begin{bmatrix} 1 & -1 \\ 1 & 1 \end{bmatrix} : 1 - 2 + 2 \neq 0$

$\begin{bmatrix} -1 & 0 \\ 1 & -1 \end{bmatrix} : 1 + 2 + 1 \neq 0$

$\therefore \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ has eigen value = 1

29. $X(1, 4),\ 4(-1, \sigma^2)$

$P(X \le -1) \quad z = \dfrac{-1-1}{2} = -1$

$= P(z \le -1) = P(z \ge 1) = 0.5 - P(0 < z < 1) = .5 - .3413 = .1587$

If $\sigma = 3$, then, $P(z \ge 2),\ z = \dfrac{2+1}{3} = 1$

$= P(z \ge 1) = .1587$

31. (iii) $(P \wedge Q) \vee (P \wedge \sim Q) \vee (\sim P \wedge \sim Q)$

$= (P \wedge (Q \vee \sim Q)) \vee (\sim P \wedge \sim Q)$

$= P \vee (\sim P \wedge \sim Q)$

$= (P \vee \sim P) \wedge (P \vee \sim Q)$

$= P \vee \sim Q$

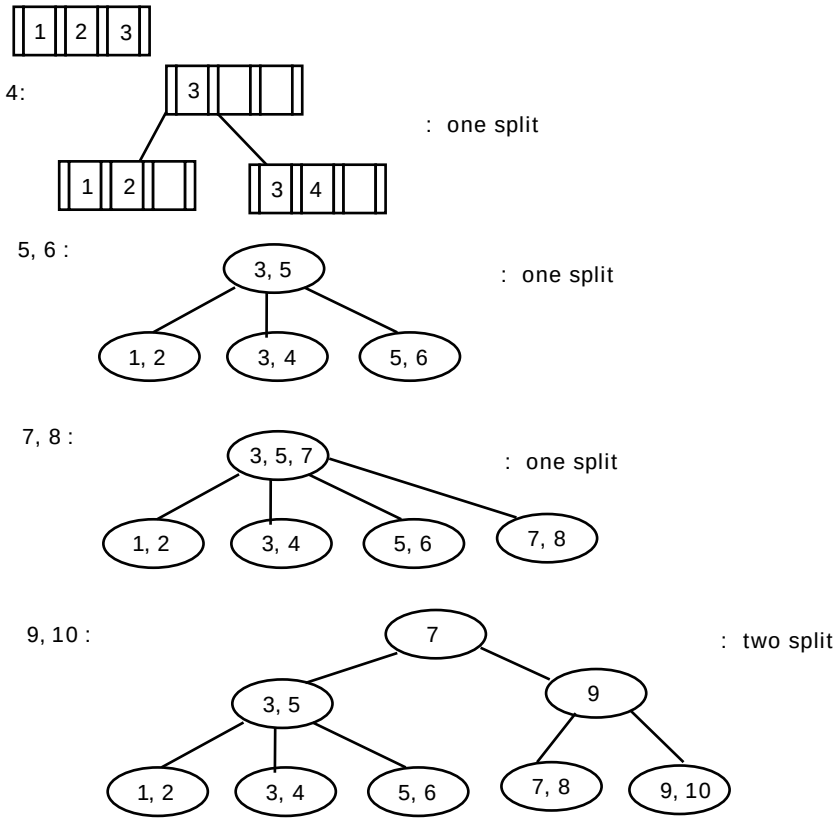
(iv) $(P \wedge Q) \vee (P \wedge \sim Q) \vee (\sim P \wedge Q)$

$= P \vee (\sim P \wedge Q)$

$= (P \vee \sim P) \wedge (P \vee Q)$

$= P \vee Q$

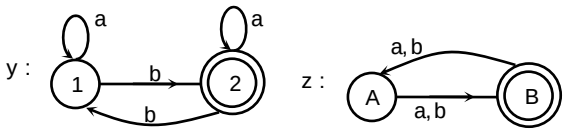
41. Let 1 to 10 be inserted



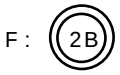
45.

	a	b	c	d	e	f	g	h
a	0	1	∞	∞	∞	∞	∞	∞
ab	–	–	3	∞	–2	∞	∞	∞
abe	–	–	3	∞	–	0	∞	∞
abef	–	–	3	∞	–	–	3	∞
abefg	–	–	3	∞	–	–	–	5

49.



	a	b
1A	1B	2B
1B	1A	2A
2B	2A	1A
2A	2B	1B



57. 248 : 11111000

Number of hosts per subnet = 2^{11}-2=2046

60. Giving warning message at line:

"**ppz + = 1;"

61. No option is giving required answer

69. BOOK (A, B, C, D, E, F)

Collection (A, B, C)

FD: AB $\rightarrow$ C

C $\rightarrow$ ABD

DAE $\rightarrow$ F

71.

Tag	Set	block
17	11	4

Total size of tags = $17 \times 2 \times 1024$ bits = 34 kbits

75. $f_1(8)$:

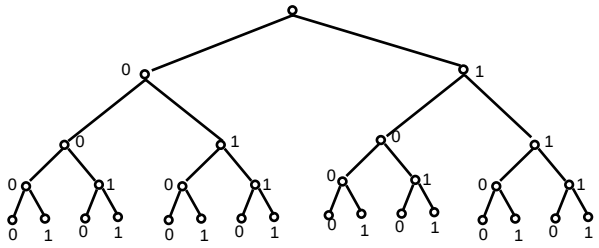
$f_1(2) = 2f(1) + 3f(0) = 2$

$f_1(3) = 2f(2) + 3f(1) = 7$

$f_1(4) = 2f(3) + 3f(2) = 20$

and so on

78.



n	x_n
0	0
1	2
2	3
3	5
4	8

$\therefore \quad x_n = x_{n-1} + x_{n-2}$

79. $\therefore \quad x_5 = x_4 + x_3 = 8 + 5 = 13$