



I B.Tech. II Semester – Regular Examinations, June/ July – 2025

Subject Name: Digital Logic Design [24EC11RC05]

Max. Marks: 70 M

Faculty Name: P V K Chaitanya

Branches: ECE, CSE, CSE(AIML), IT

ANSWER KEY

1 a)

$$\begin{array}{r} 16 \overline{) 2365} \\ 16 \overline{) 147} \quad - 13(D) \\ 16 \overline{) 9} \quad - 3 \\ 0 \quad - 9 \end{array} \quad \uparrow$$

$$(2365)_{10} = (93D)_{16}$$

$$\begin{array}{r} 8 \overline{) 2365} \\ 8 \overline{) 295} \quad - 5 \\ 8 \overline{) 36} \quad - 7 \\ 8 \overline{) 4} \quad - 4 \\ 0 \quad - 4 \end{array} \quad \uparrow$$

$$(2365)_{10} = (4475)_8$$

$$\begin{array}{cccc} 0010 & 1010 & 1010 & 1111 \\ \hline 2 & A & A & F \end{array}$$

$$(10101010101111)_2 = (2AAF)_{16}$$

$$\begin{array}{ccccc} 0101 & 0101 & 0101 & 0111 & 1 \\ \hline 2 & 5 & 2 & 5 & 7 \end{array}$$

$$(10101010101111)_2 = (25257)_8$$

1 b)

Given data word is 11110000

$$\therefore m = 8$$

If no. of parity bits is 'p', then

$$2^p \geq m + p + 1$$

$$\text{if } p = 4, \quad 2^4 \geq 8 + 4 + 1$$

$$16 \geq 13 \quad \text{TRUE}$$

$\therefore$ no. of parity bits to be added is 4

$$1 \quad 1 \quad 1 \quad 1 \quad 0 \quad 0 \quad 0 \quad 0$$

bit location table

bit designation	bit location	binary representation	bit values
P ₁	1	0001	1
P ₂	2	0010	1
D ₃	3	0011	1
P ₄	4	0100	1
D ₅	5	0101	1
D ₆	6	0110	1
D ₇	7	0111	1
P ₈	8	1000	1
D ₉	9	1001	0
D ₁₀	10	1010	0
D ₁₁	11	1011	0
D ₁₂	12	1100	0

using even parity

$$P_1 \rightarrow 1, 3, 5, 7, 9, 11 \rightarrow \text{Odd no. of 1's} \rightarrow P_1 = 1$$

$$\begin{array}{r} 1 \\ -11100 \end{array}$$

$$P_2 \rightarrow 2, 3, 6, 7, 10, 11 \rightarrow \text{Odd no. of 1's} \rightarrow P_2 = 1$$

$$\begin{array}{r} 1 \\ -11100 \end{array}$$

$$P_4 \rightarrow 4, 5, 6, 7, 12 \rightarrow \text{Odd no. of 1's} \rightarrow P_4 = 1$$

$$\begin{array}{r} 1 \\ -1110 \end{array}$$

$$P_8 \rightarrow 8, 9, 10, 11, 12 \rightarrow \text{Even no. of 1's} \rightarrow P_8 = 0$$

$$\begin{array}{r} 0 \\ -0000 \end{array}$$

The 12-bit hamming code is 111111100000

2 a)

$$28 - 78$$

$$28 \rightarrow 0001\ 1100$$

$$78 \rightarrow 0100\ 1110$$

$$\begin{array}{r} -78 \\ \downarrow 1's \\ 1011\ 0001 \\ +1 \\ \hline 1011\ 0010 \end{array}$$

2's Comp.

$$\begin{array}{r} 28 \rightarrow 0001\ 1100 \\ +(-78) + 1011\ 0010 \\ \hline (1)1001\ 110 \end{array}$$

MSB bit is '1'. So, the answer is negative.

To get the magnitude, find 2's Complement of result

$$1100\ 1110$$

$$\begin{array}{r} \downarrow 1's \\ 0011\ 0001 \\ +1 \\ \hline 0011\ 0010 \end{array}$$

$$(0011\ 0010)_2 = (50)_{10}$$

$\therefore$ Answer is -50

$$128 - 456$$

$$128 \rightarrow 001000\ 0000$$

$$456 \rightarrow 011100\ 1000$$

$$\begin{array}{r} -456 \\ \downarrow 1's \\ 100011\ 0111 \\ +1 \\ \hline 100011\ 1000 \end{array}$$

2's Comp.

$$\begin{array}{r} 128 \rightarrow 001000\ 0000 \\ +(-456) \rightarrow 100011\ 1000 \\ \hline (1)01011\ 1000 \end{array}$$

MSB bit is '1'. So the answer is negative.

To get the magnitude, find 2's complement of result

$$101011\ 1000$$

$$\begin{array}{r} \downarrow 1's \\ 010100\ 0111 \\ +1 \\ \hline 010100\ 1000 \end{array}$$

$$(010100\ 1000)_2 = (328)_{10}$$

$\therefore$ Answer is -328 .

2 b)

Decimal	BCD	Excess-3	5421
0	0000	0011	0000
1	0001	0100	0001
2	0010	0101	0010
3	0011	0110	0011
4	0100	0111	0100
5	0101	1000	1000
6	0110	1001	1001
7	0111	1010	1010
8	1000	1011	1011
9	1001	1100	1100

From the adjacent Table

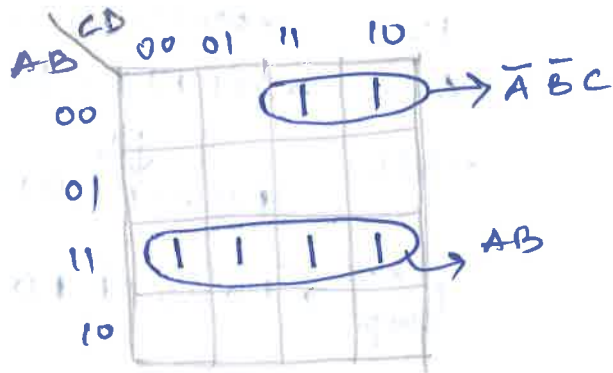
$$98457$$

$$= (1001\ 1000\ 0100\ 0101\ 0111)_{BCD}$$

$$= (1100\ 1011\ 0111\ 1000\ 1010)_{\text{Excess-3}}$$

$$= (1100\ 1011\ 0100\ 1000\ 1010)_{5421}$$

2 a) $F(A,B,C,D) = \sum (2,3,12,13,14,15)$



$\therefore F = AB + \bar{A}\bar{B}C$

3 b) $BDE + \bar{B}\bar{C}D + CDE + \bar{A}\bar{B}CE + \bar{A}\bar{B}C + \bar{B}\bar{C}\bar{D}\bar{E}$

$= BDE + \bar{B}\bar{C}(D + \bar{D}\bar{E}) + CDE + \bar{A}\bar{B}C(1 + E)$

$A + \bar{A}B = A + B$
 $1 + A = 1$

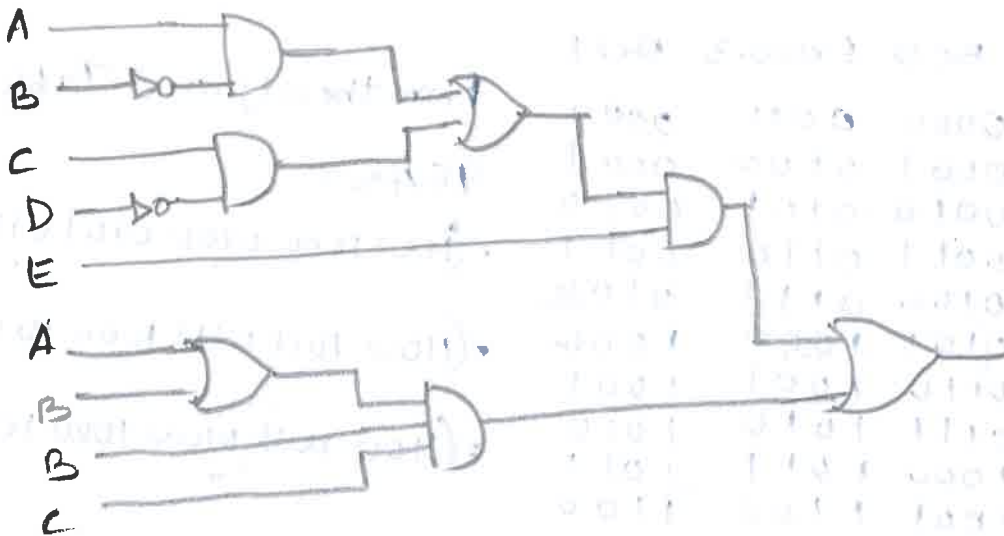
$= BDE + \bar{B}\bar{C}(D + \bar{E}) + CDE + \bar{A}\bar{B}C$

$= BDE + CDE + \bar{B}\bar{C}D + \bar{B}\bar{C}\bar{E} + \bar{A}\bar{B}C$

4 a) $(\bar{A}\bar{B} + \bar{C}\bar{D})E + BC(A+B)$

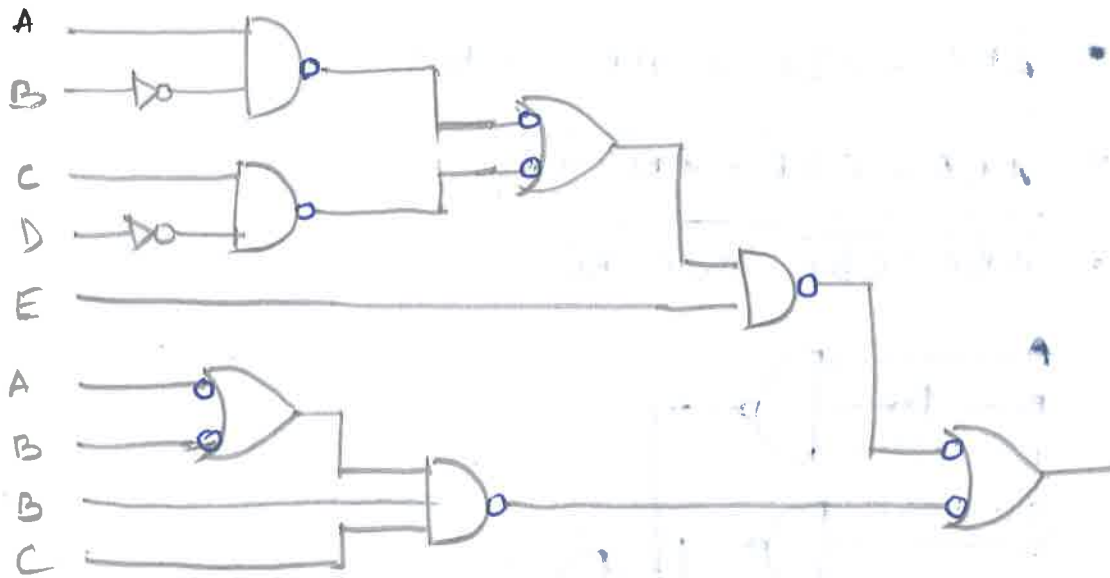
Step 1

Draw AOI Logic



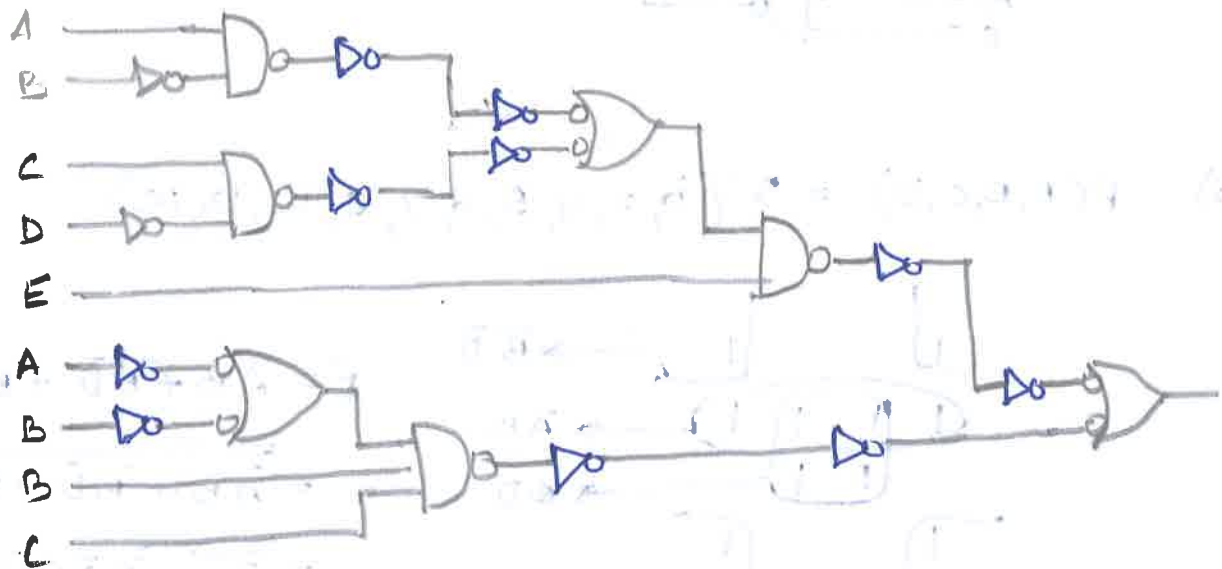
Step 2

Add bubbles at i/p of OR gate and o/p of AND gate



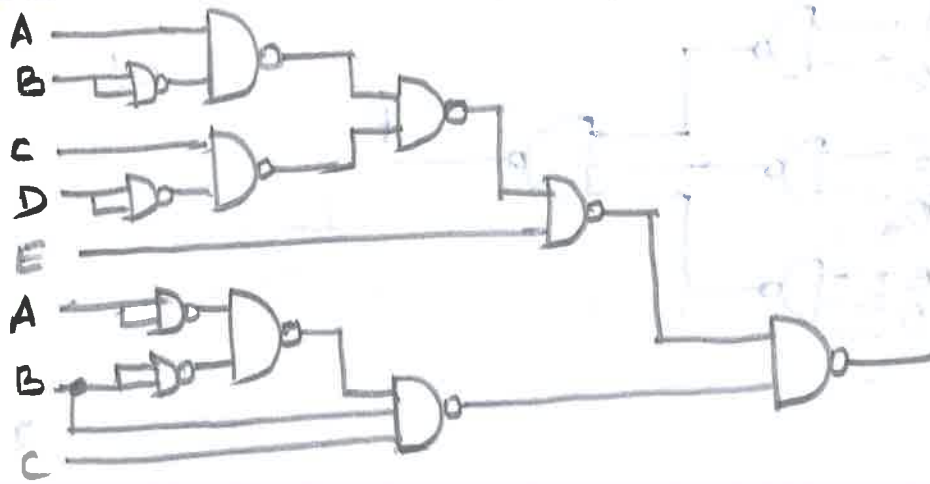
Step 3

Add an inverter on each line that received a bubble



Step 4

Remove double inversions & replace bubbled OR with NAND

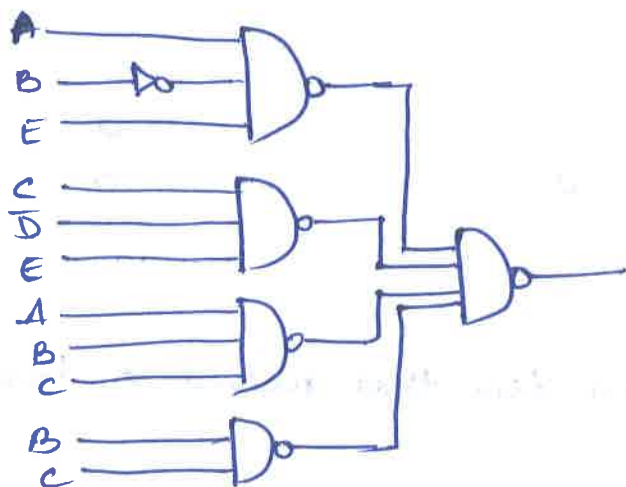


$$(A\bar{B} + C\bar{D})E + BC(A+B)$$

$$= \overline{A\bar{B}E + C\bar{D}E + ABC + BC}$$

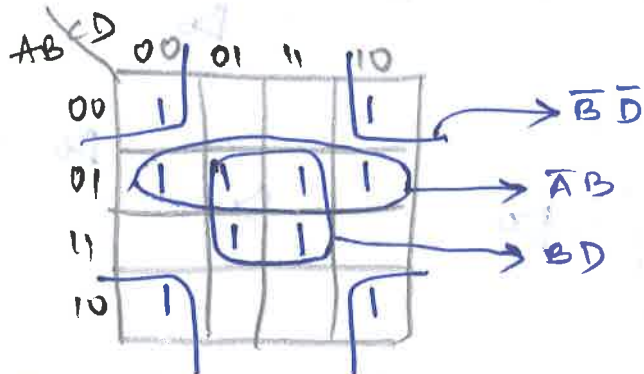
$$= \overline{A\bar{B}E + C\bar{D}E + ABC + BC}$$

$$= \overline{A\bar{B}E} \cdot \overline{C\bar{D}E} \cdot \overline{ABC} \cdot \overline{BC}$$

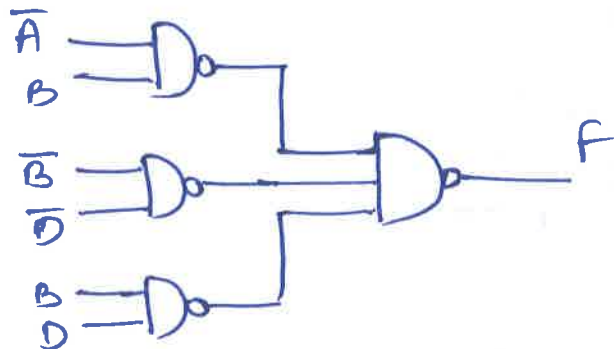


4

b) $F(A,B,C,D) = \sum(0, 2, 4, 5, 6, 7, 8, 10, 13, 15)$



$$\begin{aligned} F &= \bar{A}B + \bar{B}\bar{D} + BD \\ &= \overline{\bar{A}B} + \overline{\bar{B}\bar{D}} + \overline{BD} \\ &= \overline{\bar{A}B} \cdot \overline{\bar{B}\bar{D}} \cdot \overline{BD} \end{aligned}$$



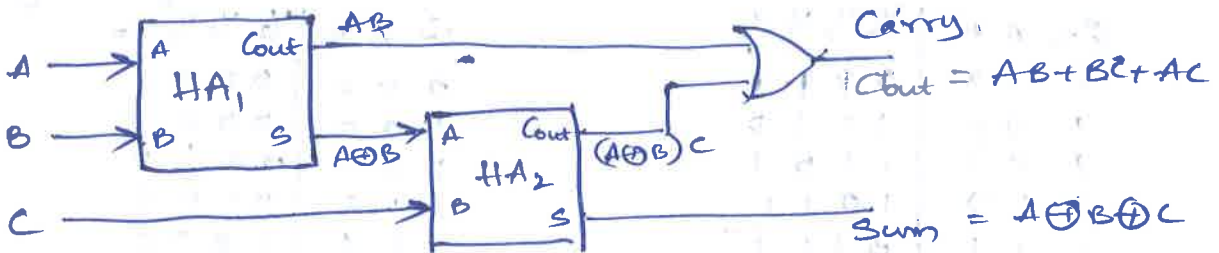
a) A Combinational logic circuit is formed by the combination of different logic gates. It is a type of digital circuit where the output is solely determined by the current combination of the inputs.

Full Adder

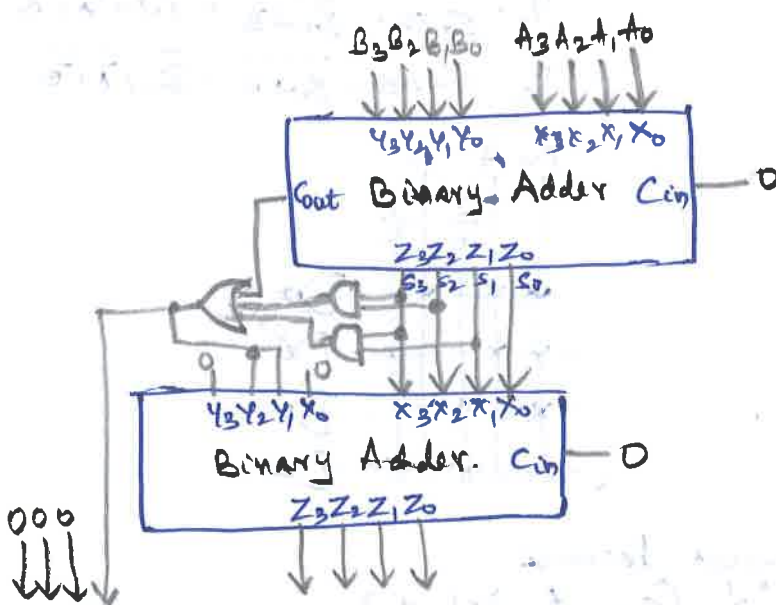
A	B	C	Count	Sum
0	0	0	0	0
0	0	1	0	1
0	1	0	0	1
0	1	1	1	0
1	0	0	0	1
1	0	1	1	0
1	1	0	1	0
1	1	1	1	1

$$\text{Sum} = A \oplus B \oplus C$$

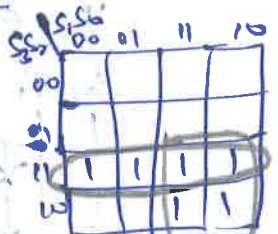
$$\text{Count} = AB + BC + AC$$



5 b) BCD Adder



$S_3S_2S_1S_0$	Y
0000	0
0001	0
0010	0
0011	0
0100	0
0101	0
0110	0
0111	0
1000	0
1001	0
1010	1
1011	1
1100	1
1101	1
1110	1
1111	1



$$S_3S_2 + S_3S_1$$

if $C=1$ or if result is invalid, then add 0110

if $C=0$ and result is valid BCD, then add 0000

4-bit Binary parallel Adder / Subtractor

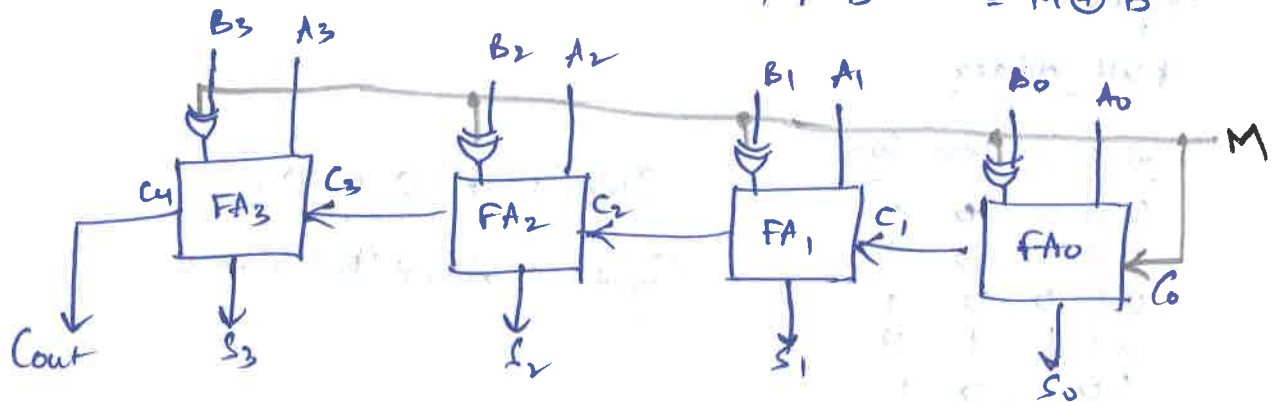
Control signal

$M=0 \rightarrow$ Addition

$M=1 \rightarrow$ Subtraction

M	Y
0	B
1	$\bar{B}$

$$Y = \bar{M}B + M\bar{B} \\ = M \oplus B$$



2:4 Decoder using NAND gates

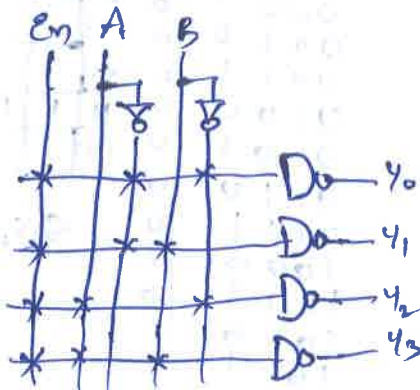
E_n	A	B	Y_3	Y_2	Y_1	Y_0
0	x	x	0	0	0	0
1	0	0	1	1	1	0
1	0	1	1	1	0	1
1	1	0	1	0	1	1
1	1	1	0	1	1	1

$$Y_0 = \overline{E_n A B}$$

$$Y_1 = \overline{E_n \bar{A} B}$$

$$Y_2 = \overline{E_n A \bar{B}}$$

$$Y_3 = \overline{E_n \bar{A} \bar{B}}$$



2:4 Decoder using NOR gates

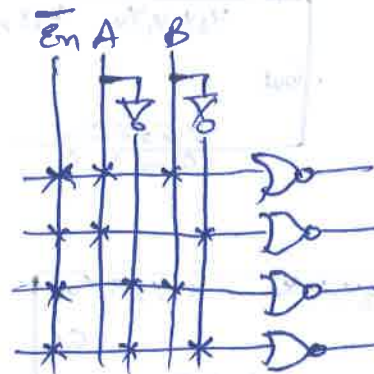
E_n	A	B	Y_3	Y_2	Y_1	Y_0
0	x	x	0	0	0	0
1	0	0	0	0	0	1
1	0	1	0	0	1	0
1	1	0	0	1	0	0
1	1	1	1	0	0	0

$$Y_0 = E_n \bar{A} \bar{B} = \overline{\overline{E_n \bar{A} \bar{B}}} = \overline{E_n + A + B}$$

$$Y_1 = E_n \bar{A} B = \overline{\overline{E_n \bar{A} B}} = \overline{E_n + A + \bar{B}}$$

$$Y_2 = E_n A \bar{B} = \overline{\overline{E_n A \bar{B}}} = \overline{E_n + \bar{A} + B}$$

$$Y_3 = E_n A B = \overline{\overline{E_n A B}} = \overline{E_n + \bar{A} + \bar{B}}$$



NAND realization is convenient because

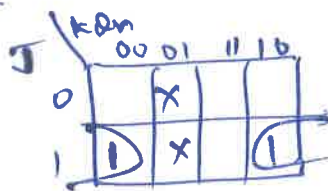
- Selected o/p becomes '0' (Easy to Detect)
- NAND logic gives this behaviour naturally
- NAND gates are faster & cheaper

7 a)

SR flip flop to JK flip flop

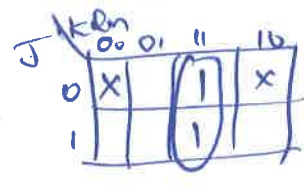
Inputs J K	Present state Q_n	Next state Q_{n+1}	Put flip Equations S R
0 0	0	0	0 X
0 0	1	1	X 0
0 1	0	0	0 X
0 1	1	0	0 1
1 0	0	1	1 0
1 0	1	1	X 0
1 1	0	1	1 0
1 1	1	0	0 1

for S

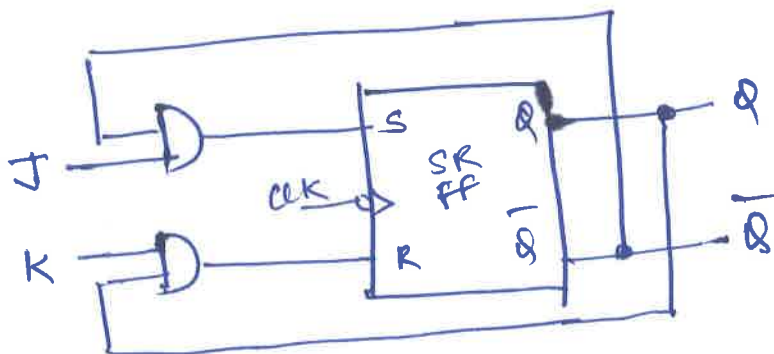


$$S = J \bar{Q}_n$$

for R



$$R = K Q_n$$



7 b)

$m=1 \rightarrow$ Right shift
 $m=0 \rightarrow$ Left shift

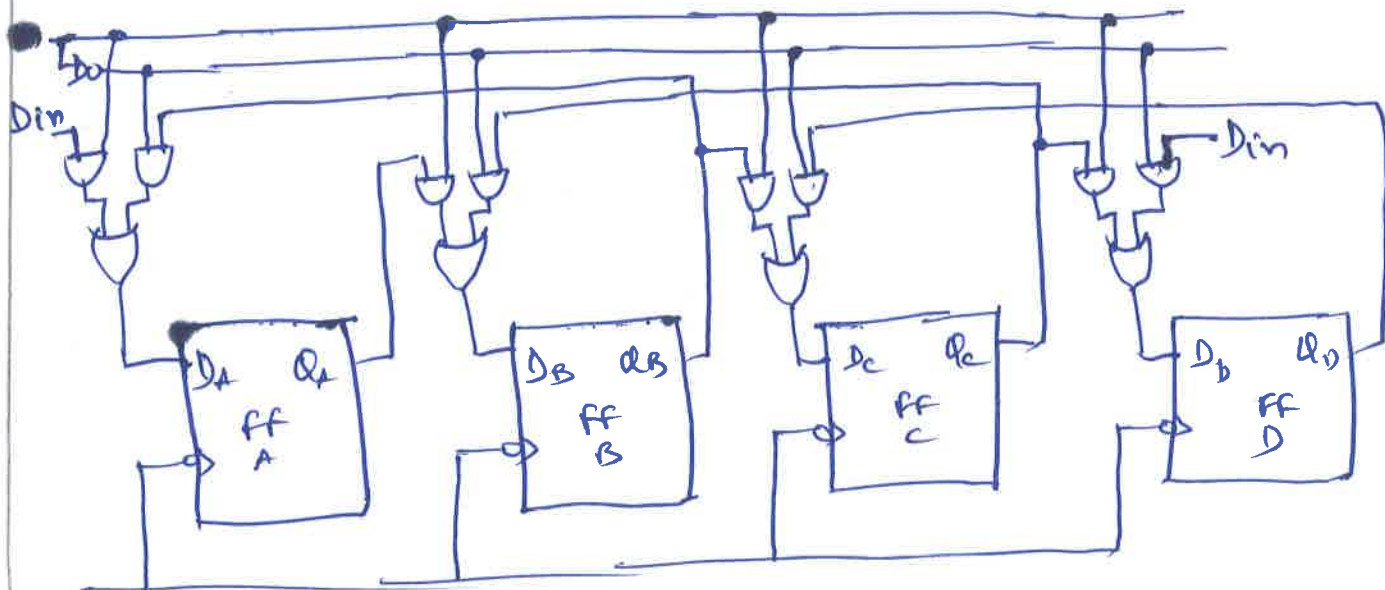
m	D_A	D_B	D_C	D_D	Output
1	D_{in}	Q_A	Q_B	Q_C	Q_D
0	Q_B	Q_C	Q_D	D_{in}	Q_A

$$D_A = m D_{in} + \bar{m} Q_D$$

$$D_B = m Q_A + \bar{m} Q_C$$

$$D_C = m Q_B + \bar{m} Q_D$$

$$D_D = m Q_C + \bar{m} D_{in}$$



Handwritten notes at the top of the page, including the word "Handwritten" and other illegible text.



Handwritten notes in the middle section of the page, arranged in two columns. The text is mostly illegible due to fading.

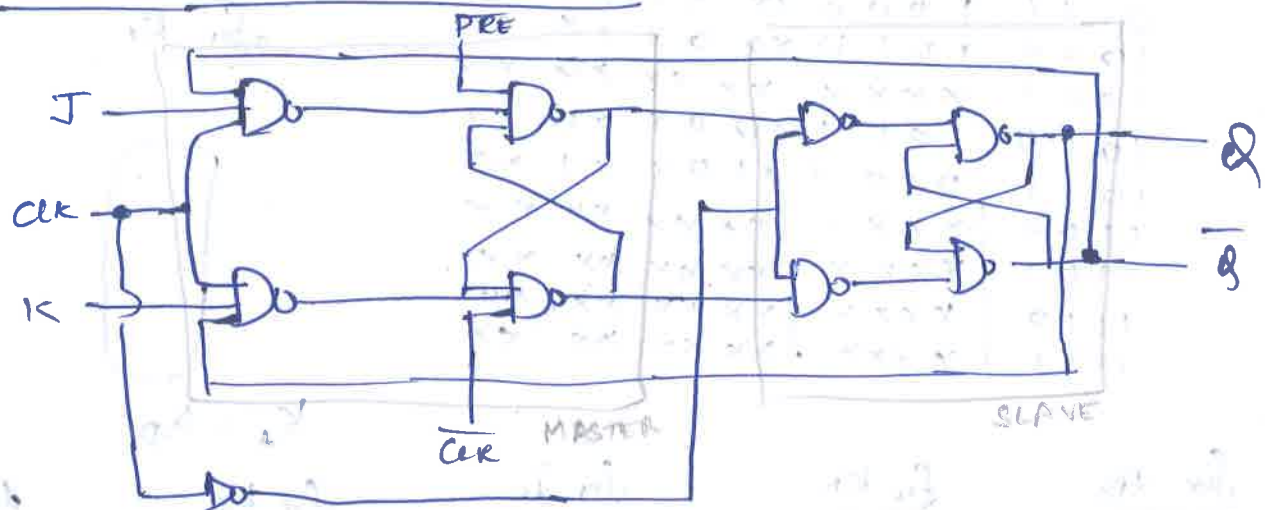


Drawback of JK flip flop

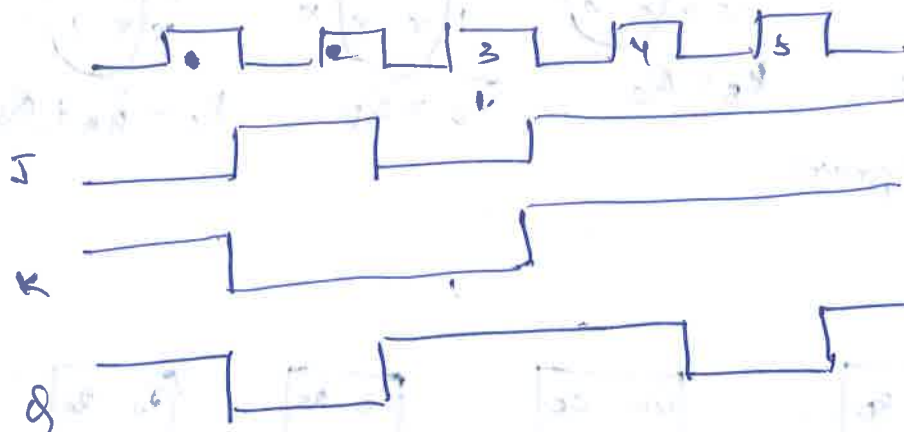
For JK flip flop, if $J = K = 1$, then the flip flop keep on changing from 0 to 1, 1 to 0, 0 to 1, and so, at the end of clock pulse, its state will be uncertain. This condition is called race-around condition.

- To overcome this problem, we need to use Master-Slave Flip flop.

Master-Slave JK flip flop



The operation would be same as negative edge-triggered JK flip flop.



Output of Master is given to the input of the slave. Clock of Master is inverted and given to the clock of the slave.

Counter to count states 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000

no. of states is 9.

∴ We require 4 flipflops.

Excitation Table of Counter

Present State $Q_A Q_B Q_C Q_D$	Next State $Q_A Q_B Q_C Q_D$	Flip flop inputs $J_A K_A J_B K_B J_C K_C J_D K_D$
0000	0001	0 0 0 0 0 0 0 0
0001	0010	0 0 0 0 0 0 0 0
0010	0011	0 0 0 0 0 0 0 0
0011	0100	0 0 0 0 0 0 0 0
0100	0101	0 0 0 0 0 0 0 0
0101	0110	0 0 0 0 0 0 0 0
0110	0111	0 0 0 0 0 0 0 0
0111	1000	0 0 0 0 0 0 0 0
1000	1001	0 0 0 0 0 0 0 0
1001	1010	0 0 0 0 0 0 0 0
1010	1011	0 0 0 0 0 0 0 0
1011	1100	0 0 0 0 0 0 0 0
1100	1101	0 0 0 0 0 0 0 0
1101	1110	0 0 0 0 0 0 0 0
1110	1111	0 0 0 0 0 0 0 0

for J_A

$Q_B Q_C$	00	01	11	10
00	0	0	0	0
01	0	0	0	0
11	0	0	0	0
10	0	0	0	0

$$J_A = Q_B Q_C$$

for K_A

$Q_B Q_C$	00	01	11	10
00	0	0	0	0
01	0	0	0	0
11	0	0	0	0
10	0	0	0	0

$$K_A = Q_D$$

for J_B

$Q_A Q_C$	00	01	11	10
00	0	0	0	0
01	0	0	0	0
11	0	0	0	0
10	0	0	0	0

$$J_B = Q_A Q_C$$

for K_B

$Q_A Q_C$	00	01	11	10
00	0	0	0	0
01	0	0	0	0
11	0	0	0	0
10	0	0	0	0

$$K_B = Q_C$$

for J_C

$Q_A Q_D$	00	01	11	10
00	0	0	0	0
01	0	0	0	0
11	0	0	0	0
10	0	0	0	0

$$J_C = Q_D$$

for K_C

$Q_A Q_D$	00	01	11	10
00	0	0	0	0
01	0	0	0	0
11	0	0	0	0
10	0	0	0	0

$$K_C = \bar{Q}_A + Q_D$$

for J_D

$Q_B Q_C$	00	01	11	10
00	0	0	0	0
01	0	0	0	0
11	0	0	0	0
10	0	0	0	0

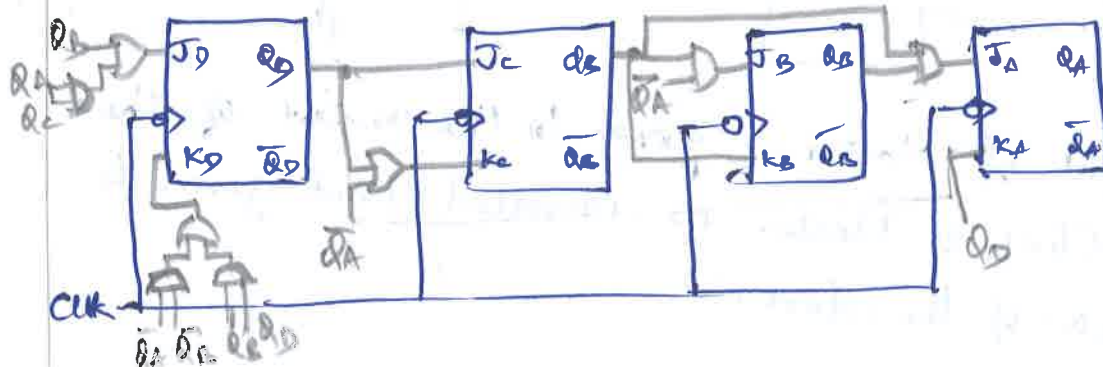
$$J_D = Q_B + Q_A Q_C$$

for K_D

$Q_A Q_B$	00	01	11	10
00	0	0	0	0
01	0	0	0	0
11	0	0	0	0
10	0	0	0	0

$$K_D = \bar{Q}_A \bar{Q}_B + Q_B Q_D$$

Logic Diagram



a)

Sequence Detector to detect 1100

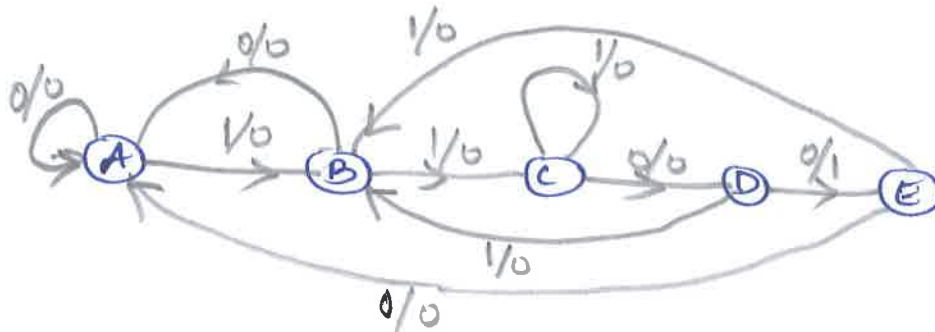
A $\rightarrow$ Initial State

B $\rightarrow$ 1

C $\rightarrow$ 11

D $\rightarrow$ 110

E $\rightarrow$ 1100



State Table

PS	NS, Z	
	x=0	x=1
A	A, 0	B, 0
B	A, 0	C, 0
C	D, 0	C, 0
D	E, 1	B, 0
E	A, 0	B, 0

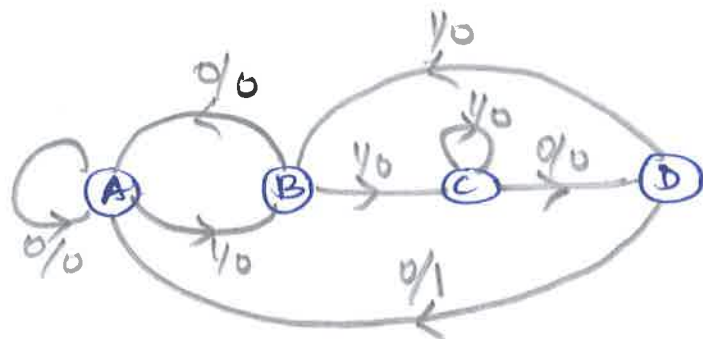
States A and E are equivalent states.

Let us remove state E and replace it with state A.

Final State Diagram

Final State Table

PS	NS, Z	
	x=0	x=1
A	A, 0	B, 0
B	A, 0	C, 0
C	D, 0	C, 0
D	A, 1	B, 0



10 b)

State Reduction identifies and removes the redundant (or) equivalent states.

An Example:

Advantages:-

Reduces Hardware Complexity

Reduces Cost

Increases Speed

Improves Efficiency

Simplifies Design

Verified

Prepared by,

P.V.K. Chaitanya

Assistant Professor

ECE, GUPCBZ

1. The first part of the document is a list of names and dates.

2. The second part of the document is a list of names and dates.

3. The third part of the document is a list of names and dates.

4. The fourth part of the document is a list of names and dates.

5. The fifth part of the document is a list of names and dates.



6. The sixth part of the document is a list of names and dates.

7. The seventh part of the document is a list of names and dates.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100

8. The eighth part of the document is a list of names and dates.

9. The ninth part of the document is a list of names and dates.

10. The tenth part of the document is a list of names and dates.