	E.G.S. PILLAY ENGINEERING COLLEGE (An Autonomous Institution, Affiliated to Anna University, Chennai) Nagore Post, Nagapattinam – 611 002, Tamilnadu.	Rev.0 COE/2017/QB

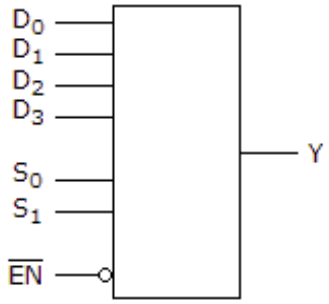
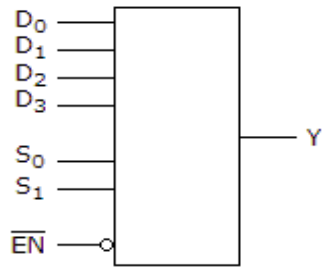
DIGITAL ELECTRONICS

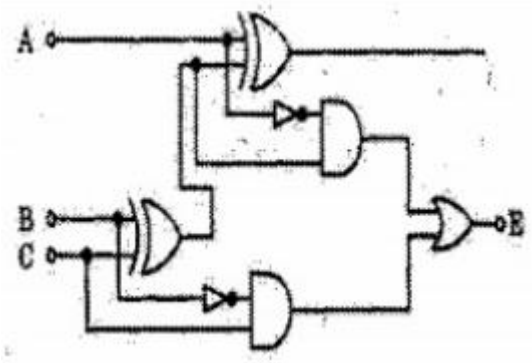
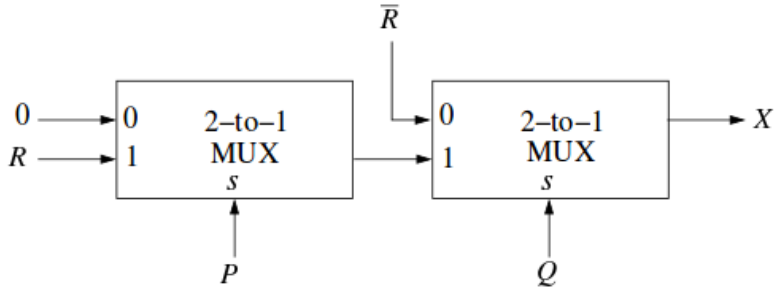
Academic Year :	2021-2022	**Question Bank**	Programme	B.E - EEE
Year / Semester :	II / III		Course Coordinator:	Dr. V.Mohan

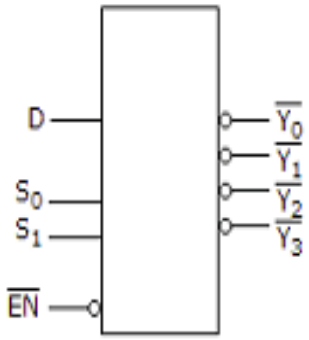
Course Objectives	Course Outcomes
1. To study the fundamentals of digital systems, programmable logic devices and logic families. 2. To design and implement combinational logic circuits. 3. To design and implement synchronous and asynchronous sequential logic circuits.	On the successful completion of the course, students will be able to CO1: Solve digital system problems using number systems, binary codes, logic gates, Boolean algebra and Karnaugh Map (K3) CO2: Construct combinational logic circuits using logic gates and multiplexers (K3) CO3: Build synchronous sequential logic circuits using excitation table, stable table and state diagrams (K3) CO4: Construct asynchronous sequential logic circuits using flow table, transition table, state assignment and state reduction techniques (K3) CO5: Implement Boolean functions and combinational logic circuits using memories, programmable logic devices and logic families (K3)

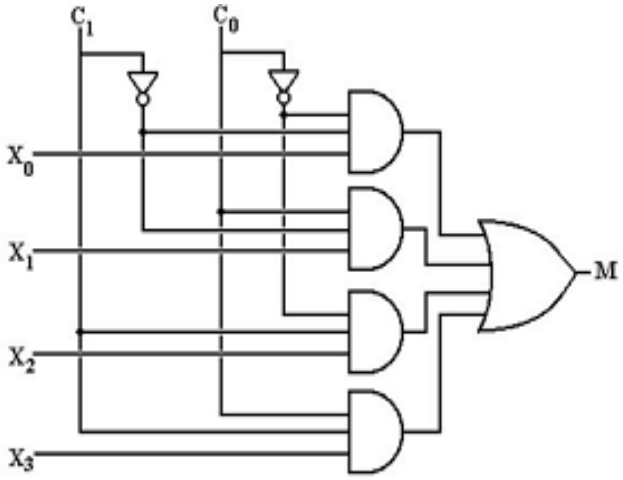
MODULE 2: COMBINATIONAL LOGIC CIRCUITS

CO2: Construct combinational logic circuits using logic gates and multiplexers (K3)

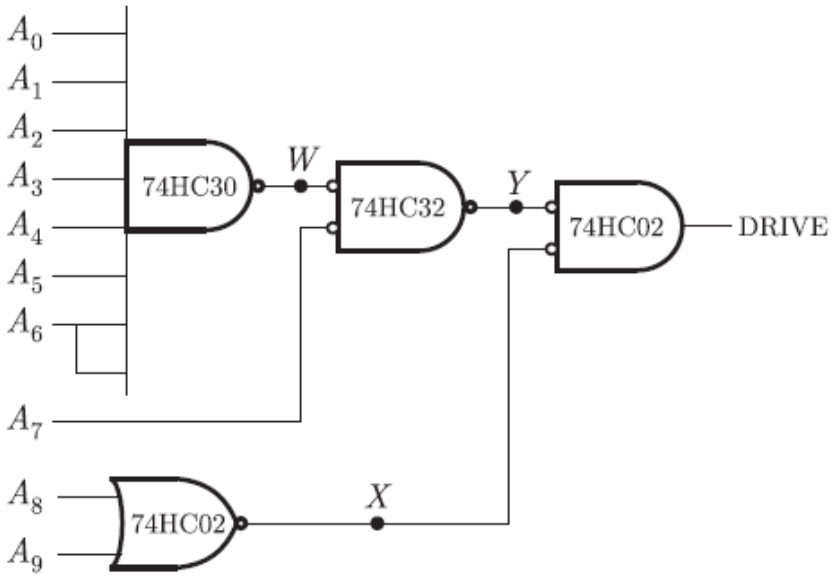
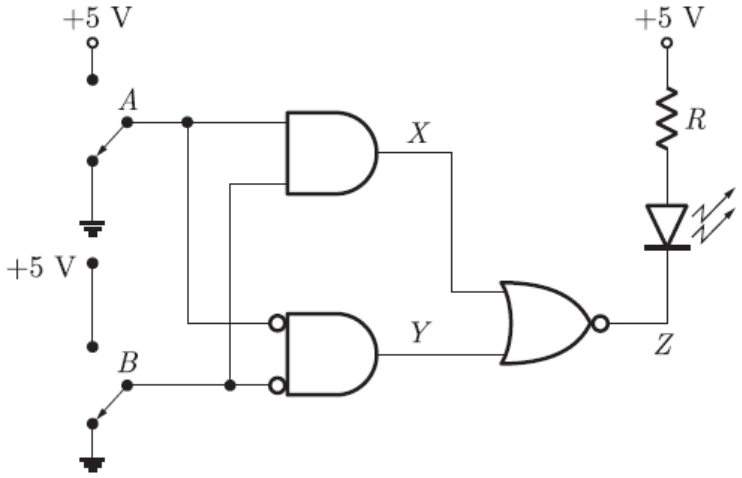
S.No	Questions	Mark	COs	BTL
1	The device shown here is most likely a _____.  a) Comparator **b) Multiplexer** c) Demultiplexer d) Parity generator	1	2	2
2	For the device shown here, let all D inputs be LOW, both S inputs be HIGH, and the $\overline{EN}$ input be LOW. What is the status of the Y output? 	1	2	2

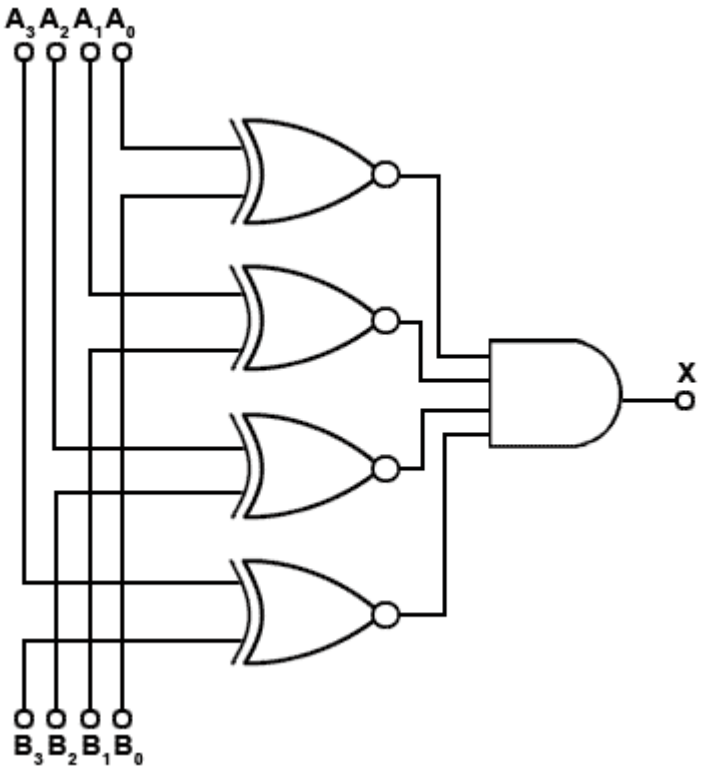
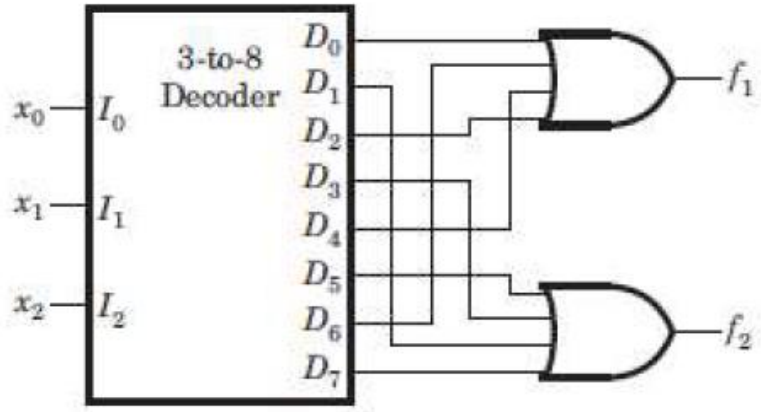
	A. LOW B. HIGH C. Don't Care D. Cannot be determined			
3	A multiplexer with a 4-bit data select input is a a) 4:1 multiplexer b) 2:1 multiplexer **c) 16:1 multiplexer** d) 8:1 multiplexer	1	2	2
4	 A combinational logic circuit is shown here. It has 3 inputs A, B, C and 2 outputs D, E. Identify the name of the circuit. a) full adder **b) full subtractor** c) shift register d) decade counter	1	2	2
5	Match the terms in List - I with the options given in List - II : **List - I** **List - II** (a) Decoder (i) 1 line to 2^n lines (b) Multiplexer (ii) n lines to 2^n lines (c) De multiplexer (iii) 2^n lines to 1 line (iv) 2^n lines to 2^{n-1} lines codes: (a) (b) (c) (1) (ii) (i) (iii) (2) (ii) (iii) (i) (3) (ii) (i) (iv) (4) (iv) (ii) (i) a) (1) **b) (2)** c) (3) d) (4)	1	2	2
6	Consider the two cascaded 2-to-1 multiplexers as shown in the figure.  Determine the minimal sum of products form of the output X.	1	2	3

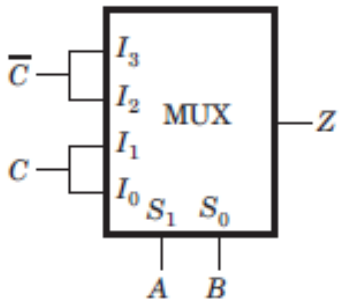
	(A) $\bar{P}\bar{Q}+PQR$ (B) $\bar{P}Q+QR$ (C) $PQ+\bar{P}\bar{Q}R$ (D) $\bar{Q}\bar{R}+PQR$ a) A b) B c) C **d) D**			
7	The device shown here is most likely a _____  a) Comparator b) Multiplexer c) Inverter d) **Demultiplexer**	1	2	2
8	The design of an ALU is based on _____ a) Sequential logic **b) Combinational logic** c) Multiplexing d) De-Multiplexing	1	2	1
9	One that is not the outcome of magnitude comparator is _____ a) a>b **b) a-b** c) a<b d) a=b	1	2	2
10	Procedure for the design of combinational circuits are: A. From the word description of the problem, identify the inputs and outputs and draw a block diagram. B. Draw the truth table such that it completely describes the operation of the circuit for different combinations of inputs. C. Simplify the switching expression(s) for the output(s). D. Implement the simplified expression using logic gates. E. Write down the switching expression(s) for the output(s). a) B, C, D, E, A b) A, D, E, B, C **c) A, B, E, C, D** d) B, A, E, C, D	1	2	2
11	The number of control lines for 32 to 1 multiplexer is a) 4 **b) 5** c) 16 d) 6	1	2	2

12	The number of bits in nibble and byte are ----- and ----- respectively. a) 2, 8 b) 8,16 **c) 4, 8** d) 1, 4	1	2	1
13	Which of the following is not a combinational logic circuit? a) Full adder b) Encoder **c) Counter** d) Demultiplexer	1	2	2
14	A device which converts decimal number into BCD form is called ----- and the device which converts BCD into octal is called ------. **a) Encoder, Decoder** b) Decoder, Encoder c) code converter, demultiplexer d) multiplexer, Decoder	1	2	1
15	The output Y of a 2 bit comparator is logic 1 whenever the 2-bit input A is greater than the 2-bit input B. The number of combination for which the output is logic 1, is a) 4 **b) 6** c) 8 d) 10	1	2	3
16	How many select lines would be required for an 8-line-to-1-line multiplexer? a) 2 b) 4 c) 8 **d) 3**	1	2	2
17	In the given 4-to-1 multiplexer, if c1 = 0 and c0 = 1 then the output M is _____  a) X0 **b) X1** c) X2 d) X3	1	2	2
18	If we record any music in any recorder, such types of process is called _____ a) Multiplexing **b) Encoding** c) Decoding d) Demultiplexing	1	2	2

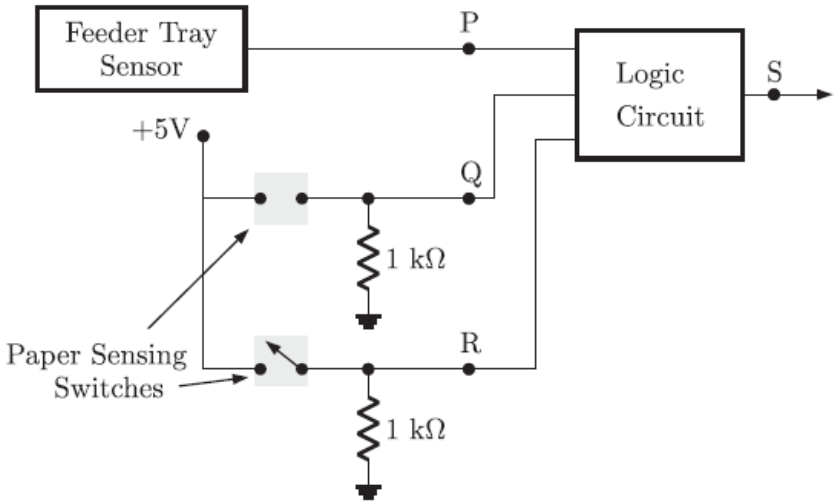
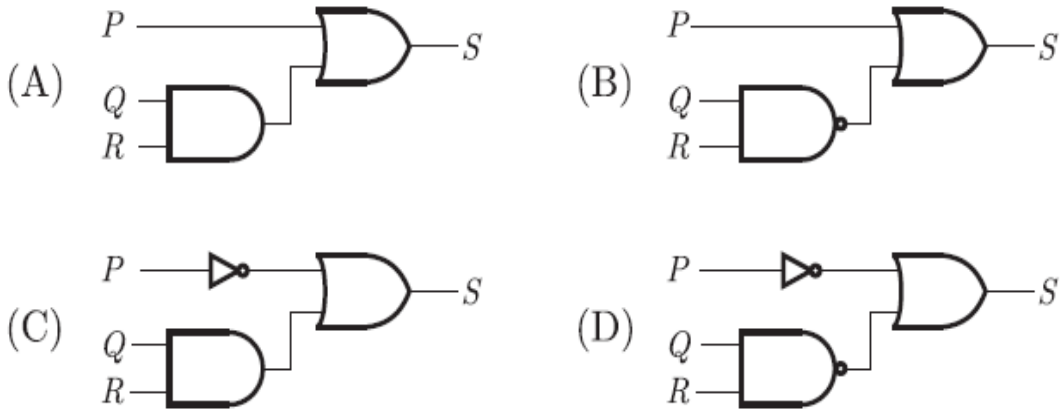
19	A certain BCD-to-decimal decoder has active-HIGH inputs and active-LOW outputs. Which output goes LOW when the inputs are 1001? A. 0 B. 3 **C. 9** D. None. All outputs are HIGH.	1	2	2
20	A basic multiplexer principle can be demonstrated through the use of a _____ a) Single-pole relay b) DPDT switch **c) Rotary switch** d) Linear stepper	1	2	2
21	How many select lines would be required for an 8-line-to-1-line multiplexer? a) 2 b) 4 c) 8 **d) 3**	1	2	2
22	A combinational circuit which is used to send data coming from a single source to two or more separate destinations is called as: (a) Decoder b) Encoder c) Multiplexer **d) Demultiplexer**	1	2	1
23	The simplified expression of full adder carry is _____ **a) c = xy+xz+yz** b) c = xy+xz c) c = xy+yz d) c = x+y+z	1	2	2
24	In a combinational circuit, the output at any time depends only on the _____ at that time. a) Past output values b) Intermediate values c) Both past output and present input **d) Present input values**	1	2	1
25	Which one of the following is odd? a) Multiplexer b) Decoder c) Adder **d) Flip-Flop**	1	2	2
26	In the following circuit , the motor will turn on when DRIVE = 1	2	2	3

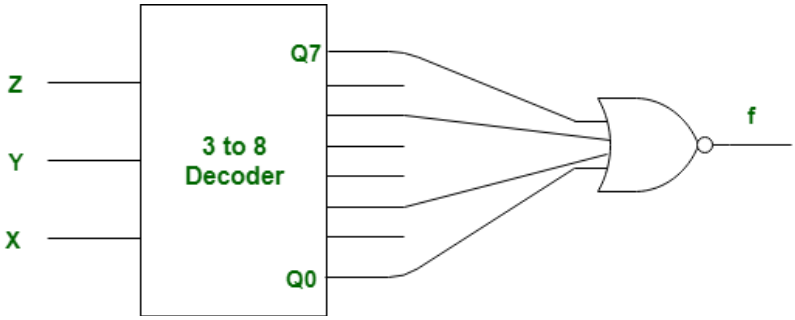
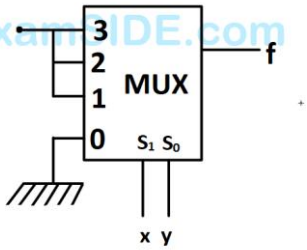
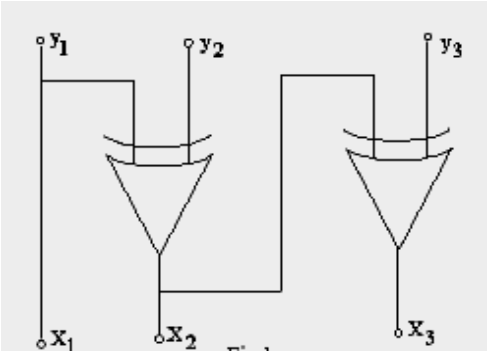
	 Identify the input values of A0, A1, A2, A3, A4, A5, A6, A7, A8 and A9 in order to run the motor. a) A0 = A1 = A2 = A3 = A4 = A5 = A6 = A7 = A8 = A9 = 1 **b) A0 = A1 = A2 = A3 = A4 = A5 = A6 = A8 = A9 = 1; A7 = 0** c) A0 = A1 = A2 = A3 = A4 = A5 = A6 = A7 = 1; A8 = A9 = 0 d) A0 = A1 = A2 = A3 = A4 = A5 = A6 = A7 = A8 = 1; A9 = 0			
27	Consider the given circuit diagram of switching of light from two different switches.  Identify the input conditions that will turn on LED. a) A=1, B=1 b) A=0, B=0 c) A=1. B=0 **d) Both (a) and (b)**	2	2	3
28	The combinational logic circuit shown below has 2 inputs A and B and has one output X. Identify the function to be performed by the circuit.	2	2	3

	 a) Gray code converter b) 4 bit magnitude comparator **c) 4 bit equality comparator** d) 4 bit adder			
29	X_0, X_1 and X_2 are the three inputs to a 3-to-8 decoder. For the given circuit arrangement, find f_1f_2.  a) $X_0 X_1 X_2$ b) $X_0 + X_1 + X_2$ c) 1 **d) 0**	2	2	3
30	The MUX shown in fig. is a 4 x 1 multiplexer. Determine the function realized by the output Z.	2	2	3



a) A XOR B
b) A XOR C
c) B XOR C
d) A + C

31	A copy machine generates a stop sign S, to stop the machine operation and energize and indicates light if according to either of the following conditions exists: (1) There is no paper in the paper feeder tray. (2) The two micro switches in the paper path are activated, indicating a jam in the paper path. The presence of paper in the feeder tray is indicated by a high at logic signal P as shown in figure.  Select a logic circuit so as to get HIGH output at S.  **Answer: C**	2	2	3

32	What Boolean function does the circuit below realize?  a) xz+x'z' **b) xz'+x'z** c) x'y'+yz d) x'y'+yz	2	2	3
33	The output f of the 4-to-1 MUX shown in fig. is  A $\overline{xy}+x$ B $x+y$ C $\overline{x}+\overline{y}$ D $xy+\overline{x}$ **Answer: B**	2	2	3
34	Identify the code generated by the given circuit. The input is a binary code - $y_1\, y_2\, y_3$.  **(A)** Excess-3 code. **(B)** Gray code. **(C)** BCD code. **(D)** Hamming code. **Answer: B**	2	2	3
35	Calculate the number of OR gates required for a Decimal-to-BCD encoder. a) 2 b) 10 c) 3 **d) 4**	2	2	3