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ANSWER KEY

FIRST YEAR HIGHER SECONDARY EXAMINATION JUNE 2022

PART-III/III

SUBJECT: ELECTRONIC SYSTEMS

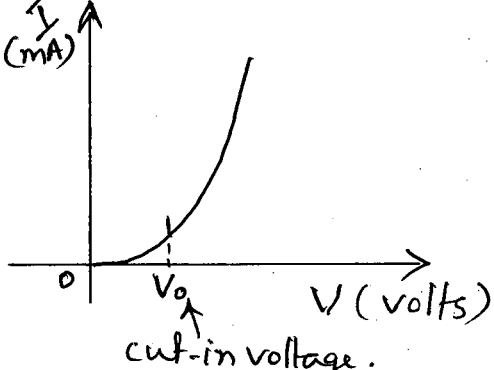
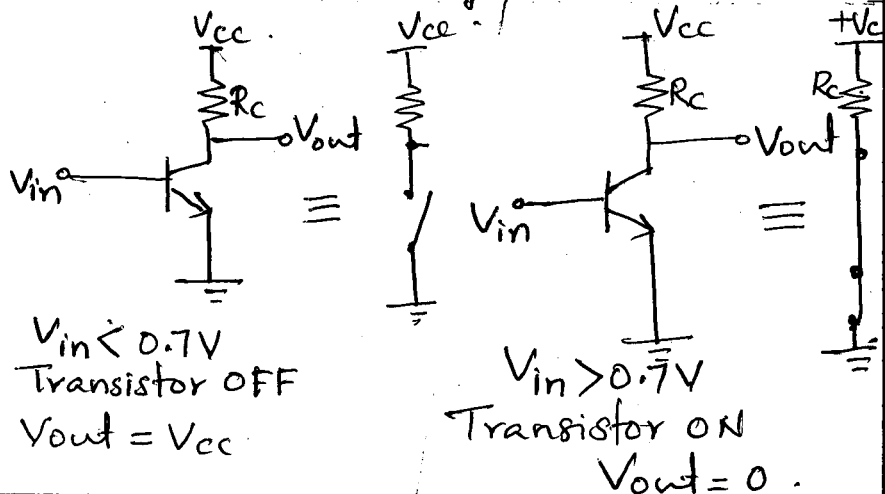
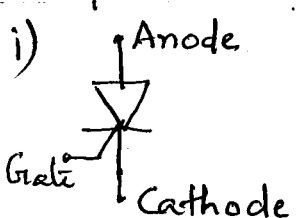
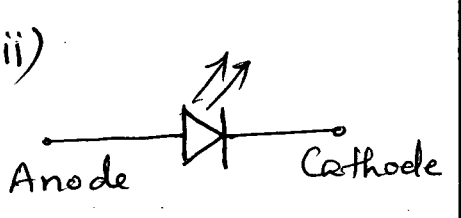
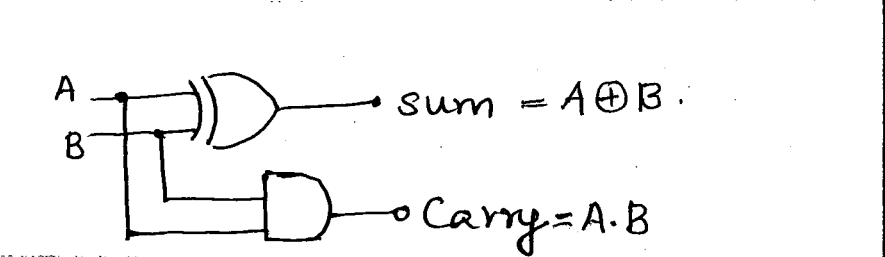
CODE NO: FY 53

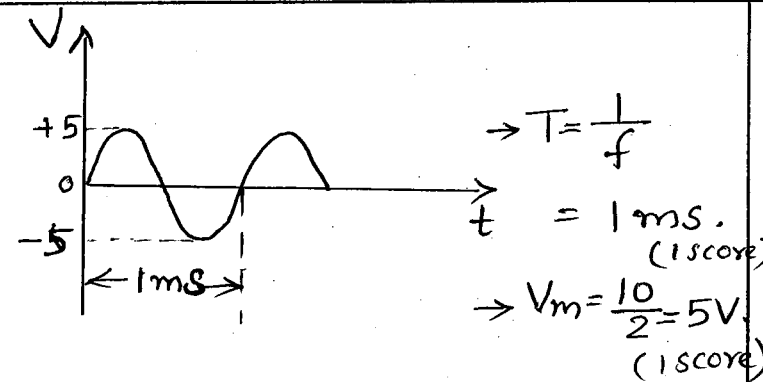
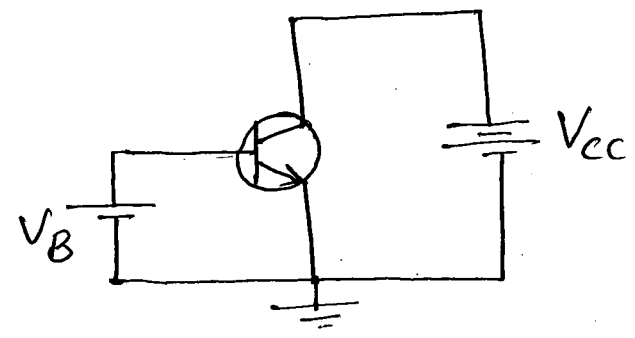
VERSION: D

60 SCORES

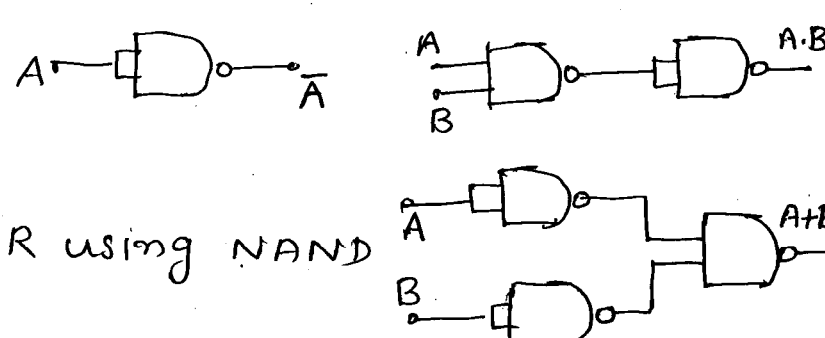
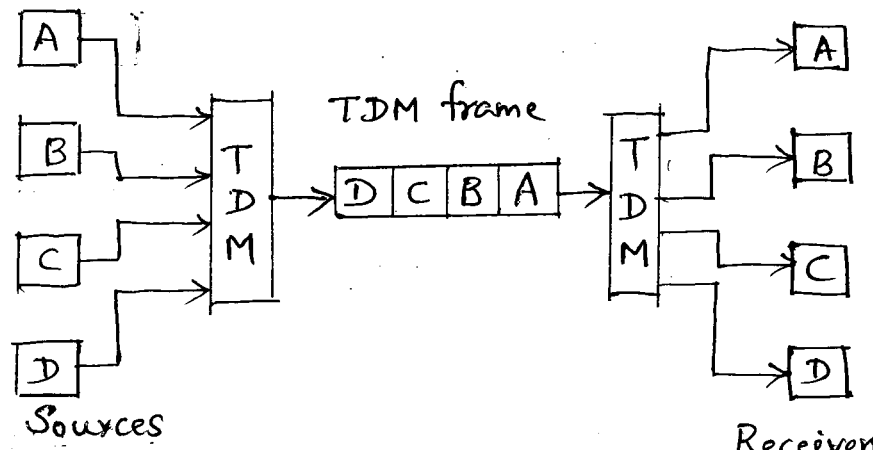
2 HOURS

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
1		$2\pi fL$	1	
2.		variable resistor	1	
3.		electrons	1	
4.		0.7V	1	
5		FET	1	
6		photo diode	1	
7		A	1	
8		1.21	1	9
9		ASK	1	
10		4 μ F	2	2
11.		i) Green Blue Brown Gold ii) Brown Black Yellow	1+1	2
12		<p>The diagram shows two energy band structures. On the left, labeled 'Conductor', the conduction band and valence band overlap. On the right, labeled 'Semiconductor', there is a clear gap between the conduction band and valence band, with a double-headed arrow indicating the gap width $E_g \approx 1\text{eV}$.</p>	1+1	2

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
13		 <p style="text-align: center;">cut-in voltage.</p>	2	2
14.		 <p style="text-align: center;">$V_{in} < 0.7V$ Transistor OFF $V_{out} = V_{cc}$</p> <p style="text-align: center;">$V_{in} > 0.7V$ Transistor ON $V_{out} = 0$</p>	1+1	2
15.		<p>explanation</p>	2	2
16.		<p>i) </p> <p>ii) </p>	1+1	2
17		 <p style="text-align: center;">sum = $A \oplus B$.</p> <p style="text-align: center;">Carry = $A \cdot B$</p>	2	2
18		<p>$F = \bar{A} \bar{B}$</p>	2	2
19.		<p>Low power consumption Low cost Good contrast etc. (any two)</p>	1+1	2
20.		<p>Explanation.</p>	2	2

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score																
21.			3	3																
22.	a)	statement	1	3																
	b)	0.2 A	2																	
23.	a)	mutual induction	1	3																
	b)	$\frac{N_1}{N_2} = \frac{V_1}{V_2}$; $V_2 = 12V$.	2																	
24.		block diagram	3	3																
25.	a)	intrinsic semiconductor	1	3																
	b)	explanation. - doping & impurities	2																	
26.	a)		2	3																
	b)	input characteristics	1																	
27.		<table border="1" data-bbox="446 1904 1133 2172"> <thead> <tr> <th>class</th> <th>at</th> <th>efficiency</th> <th>score</th> </tr> </thead> <tbody> <tr> <td>class A</td> <td>at centre</td> <td>25%-50%</td> <td>$\frac{1}{2} + \frac{1}{2}$</td> </tr> <tr> <td>class C</td> <td>Below cut off</td> <td>90%</td> <td>$\frac{1}{2} + \frac{1}{2}$</td> </tr> <tr> <td>class B</td> <td>at cut off</td> <td>78.5%</td> <td>$\frac{1}{2} + \frac{1}{2}$</td> </tr> </tbody> </table>	class	at	efficiency	score	class A	at centre	25%-50%	$\frac{1}{2} + \frac{1}{2}$	class C	Below cut off	90%	$\frac{1}{2} + \frac{1}{2}$	class B	at cut off	78.5%	$\frac{1}{2} + \frac{1}{2}$	1+1+1	3
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Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
28		circuit diagram	3	3
29.		<p style="text-align: right;">→ (2 score)</p> <p style="text-align: center;">$F = AB + C$ → (1 score)</p>	2+1	3
30.	<p>a) statement</p> <p>b)</p>	<p>$R_T = 200 \Omega$ → 1 score</p> <p>$I_T = \frac{V}{R_T} = 0.1 A$ → 1 score</p> <p>$V_p = 0.05 \times 200 = \underline{\underline{10V}}$ → 1 score</p>	1+1+1	4
31.	<p>a)</p> <p>b)</p>	<p>comparison - any two points.</p>	2+1+1	4
32.	<p>a)</p> <p>b)</p>	<p>81.2%</p> <p>circuit diagram</p>	1+3	4
33.	<p>a)</p> <p>b)</p>	<p>comparison</p> <p>structure.</p> <p>symbol</p>	2+1+1	4

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
34	a) b)	circuit diagram frequency response curve → 1 score The coupling and bypass capacitors provide high reactance at low frequencies. → 1 score	2 1+1	4
35	a) b)	OR, AND, NOT NOT using NAND AND using NAND  OR using NAND	1 1+1+1	4
36		block diagram	4	4
37	a) b)	definition → 1 score. waveform → 1 score  Sources Receivers	2 2	4