

ANSWER KEY

FIRST YEAR HIGHER SECONDARY EXAMINATION ~~MARCH~~ JUNE 22

PART-III/III

SUBJECT: ELECTRONICS

CODE NO: FY-31

VERSION: A

60 SCORES

2 HOURS

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
1		c 000	1	1
2		c $\frac{V_m}{\sqrt{2}}$	1	1
3		d 0.7 eV	1	1
4		c 0.7 V	1	1
5		c 0.8	1	1
6		a Solar Cell	1	1
7		a V_m	1	1
8		b CE Configuration	1	1
9		d $\frac{1}{2\pi\sqrt{LC}}$	1	1
10		d 111	1	1

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
11		Passive — Capacitor, Inductor, resistor Active — Transistor, Diode, IC	2	2
12		Definition of doping	2	2
13		The potential barrier near by the PN junction which prevents further movement of charge carriers across the junction	2	2
14		1 Score each for the symbols of NPN and PNP transistors	2	2
15		Symbol — 1 Score Applications — 1 Score	2	2
16		Principle — 1 Score Symbol — 1 Score	2	2

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
17	(a)	$\sigma = \sqrt{\frac{V_{rms}^2}{V_{dc}^2} - 1}$	1	
	(b)	1.21	1	2
18		<p>Oscillations whose amplitude continuously decreases with time due to losses</p>	2	2
19		<p>$A_{\beta} = 1$ Total phase shift around the loop = 0° or 360°</p>	2	2
20		Brown, Black, Red, Gold	3	3
21	(a)	nR — 1		
	(b)	R/n — 2	3	3

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
22		Diagrams — 2 Explanation — 1	3	3
23	(a)	We have to connect the positive terminal of the external supply to the p-type semiconductor of the PN junction.	2	
24	(b)	charge carriers flow across the junction overcoming the depletion layer	1	3
24	(a)	Diagrams — 2	2	
	(b)	The forward voltage at which the diode starts conducting — 1	1	3

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
25		<u>Physical Size</u> Collector - largest Base - smallest Emitter - moderate -1 <u>Doping concentration</u> Emitter - largest Base - smallest Collector - moderate -2		3
26	(a)	Diagram	2	
	(b)	$A = -\frac{R_F}{R_i}$	1	3
27		Very high input impedance Very high gain Very high bandwidth	3	3
28		Symbol - 1 Truth table - 1 output expression - 1	3	3

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29		Circuit diagram	3	3
30	(a)	$R_{\text{eff}} = R_1 + R_2 + R_3 \quad \text{--- 1}$ $= 100 + 100 + 100 = 300 \Omega \quad \text{--- 1}$	2	
	(b)	$I = \frac{V}{R} \quad \text{--- 1}$ $= \frac{300}{300} = 1 \text{ A} \quad \text{--- 1}$	2	4
31	(a)	$V_m = 141 \text{ V}$	1	
	(b)	$V_{\text{rms}} = \frac{V_m}{\sqrt{2}} = 100 \text{ V}$	1	
	(c)	$2\pi f = 314$ $f = \frac{314}{2\pi} = 50 \text{ Hz}$	2	4

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
32		Circuit diagram — 2 Working — 2	4	4
33	(a)	Circuit diagram	2	
	(b)	Working	2	4
34	(a)	Circuit diagram of Centre-tap full wave - rectifier	3	
	(b)	$PIV = V_m$	1	4
35	(a)	Circuit diagram	2	
	(b)	Three RC sections provide 360° phase shift	2	4

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
36	(a)	Any basic gate can be derived using either NAND or NOR gate	1	
	(b)	Symbol - 1 Output expression - 1 Truth table - 1	3	4
37	(a)	If both of the inputs are high, the OR gate output will be high but XOR gate output will be low.	2	
	(b)	Symbol - 1 Output expression - 1	2	4