Kerala Board

Answer Key

2024

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ANSWER KEY

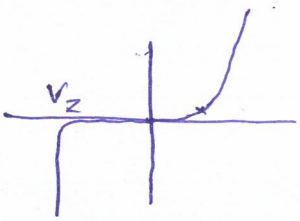
FIRST YEAR HIGHER SECONDARY EXAMINATION MARCH / 2024

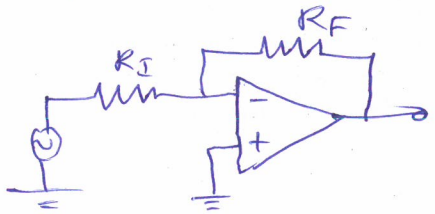
PART-I/II/III

SUBJECT: ELECTRONICS

CODE NO: **FY 431** VERSION: B

60 SCORES 2 HOURS

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
1		increases	1	1
2		260Ω	1	1
3		0eV		1
4		increases		1
5		Transistor		1
6		81%		1
7		emitter		1
8		360°		1
9		13		1
10		High resistance		1
11		$C = \frac{\varepsilon A}{d}$ ε → dielectric permittivity; A → Area of the plate; d → distance between plates		2
12		$R = \frac{15}{3} = 5\Omega$		2
13				2
14		CE has both voltage gain & current gain in large. So it has large power gain.		2

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
15		To produce different colour LED, different materials are used.	2	2
16.	a	It is a measure of ac at the output of a rectifier.	1	2
	b	0.48	1	
17				2
18		+ve feedback ÷ Input signal and feedback signal are in phase. −ve feedback ÷ Input signal and feedback signal are out of phase		2
19		2 | 25 1 2 | 12 0 2 | 6 0 2 | 3 0 1 1 $(11001)_2$		2
20		Orange Red Brown 3 2 1 $32 \times 10^1 = 320\Omega$		3
21		$I = \frac{10}{6+4} = \frac{10}{10} = 1A$ V at $4\Omega = I \times 4\Omega = 1 \times 4 = 4V$		3
22		Energy band diagrams (1 score for each)	3×1	3
23		Emitter Collector Base Doping I II III Size II I III		3

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
24		photo diode produces light according to the intensity of light. But in phototransister ~~an~~ there is amplification by a factor of β. So phototransistor produces more current than photodiode for a given intensity of light.		3
25		Coupling capacitor connects the ac input signal to the base of the amplifier without changing the DC conditions existing in the amplifier. So connecting the input doesn't change the biasing of the amplifier.		3
26		LC tank circuit has a natural frequency, $f = \frac{1}{2\pi\sqrt{LC}}$. The tank selects this frequency.		3
27		Truth table		3
28	a	Derivation	2	~~3~~ 4
	b)	$\beta = \frac{\alpha}{1-\alpha} = \frac{0.9}{1-0.9} = \frac{0.9}{0.1} = 9$	2	
29		Any ~~three~~ 4 differences		~~3~~ 4
30		Circuit	2	4
		Explanation	2	

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
31		circuit of a single stage RC coupled amplifier.		4
32		Barkhausen criterion $\lvert A\beta \rvert = 1$ and $\angle A\beta = 360^\circ$. Write what happens if $A\beta = 1$, $A\beta < 1$ and $A\beta > 1$.		4
33	a	$1\times2^2 + 0\times2^1 + 1\times2^0 + 1\times2^{-1} + 1\times2^{-2}$ $= 4 + 0 + 1 + 0.5 + 0.25$ $= \underline{5.75}$	2	4
	b)	XOR gate can be used for comparing bits. Explanation.	2	

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