

Elect

College of Engineering, Pune
END SEMESTER EXAM APRIL 2013
Year: F.Y. B. Tech
(ET 101)- (Basic Electronics)

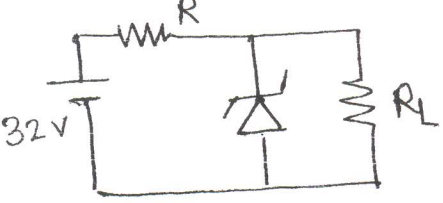
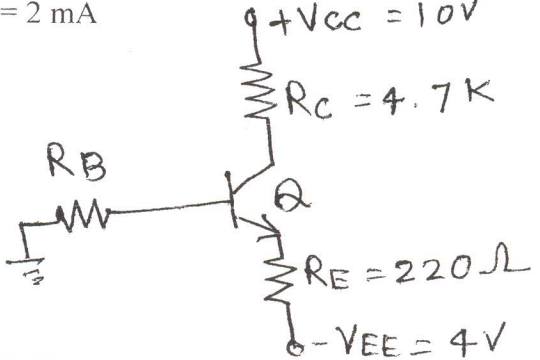
Max. Marks- 50

Duration – 3Hr

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Assume suitable data wherever necessary.
4. Draw neat figure wherever required.

Q. 1	a.	State and prove De Morgan's theorems using truth table	2M
	b.	Is it possible to use the following gates as Inverters? If yes how? a) EX - OR b) EX - NOR c) AND d) OR	2M
	c.	Explain full adder operation with the help of truth table and give minimized expression for Sum and Carry using K-map.	3M
	d.	Draw 3 bit binary asynchronous counter using flip flop, write the counting sequence and illustrate output waveform for the counter.	3M
Q. 2	a.	Explain the following terms related to microprocessor. a) Program Counter b) Ready c) EPROM d) Stack Pointer	4M
	b.	Explain any three instructions of 8085 microprocessor i) ADD B ii) ORI 75H iii) PUSH B iv) LXI H,5071H v) STA 2080H	3M
	c.	State and explain the various interrupts in 8085.	3M
		OR	
	c.	Explain Flag structure of 8085.	3M
Q.3	a.	Draw and explain Monostable Operation of 555 Timer.	3M
	b.	For Astable Multivibrator $R_A = 6.8k\Omega$, $R_B = 3.3k\Omega$ and $C = 0.1\mu F$. Calculate i) t_{on} ii) t_{off} iii) free running frequency iv) duty cycle	4M
	c.	State the fixed and variable voltage regulator ICs. What are the features of Fixed and adjustable voltage regulators?	3M
		OR	
	c.	Design Wein Bridge oscillator for the frequency of 100KHz. Given Capacitor $C = 0.1 \mu F$ and $R_1 = 5R$.	3M

Q.4	a.	Derive the output voltage expression for inverting Summing amplifier using OPAMP	3M
	b.	Draw and explain the operation of an ac voltage follower having very high input resistance.	2M
	c.	Define Q point and explain the concept of DC load line. Indicate Q point on it if the transistor is in saturation, active and cutoff region.	3M
	d.	<p>A 30 V, 500 mW Zener diode is to be used for providing a 24 V stabilized supply to a variable load. If input voltage is 32 V and $R_L = 1400 \Omega$. Calculate (1) series resistance R (2) Diode current</p> 	2M
Q.5	a.	<p>For the circuit shown in figure determine values of R_B, V_{CE}, for $\beta = 50$, $V_{BE} = 0.7 \text{ V}$ and $I_c = 2 \text{ mA}$</p> 	3M
	b.	What is Amplitude modulation? How it is different from Frequency modulation? Give advantages of AM over FM.	3M
OR			
	b.	<p>Find the carrier and modulating frequencies, the modulation index, and the maximum deviation of the FM wave represented by the voltage equation</p> $v = 12 \sin (6 \times 10^8 t + 5 \sin 1250 t)$ <p>What power will this FM wave dissipate in a $10\text{-}\Omega$ resistor?</p>	3M
	c.	<p>Explain any two of the following.</p> <ol style="list-style-type: none"> i) Satellite Communication ii) Internet Telephony iii) Telnet 	4M