College of Engineering, Pune
END SEMESTER EXAM -May 2012
Year (F. Y. B.Tech)
(ET-101)- (Elements of Electronics Engineering)

Day & Date-Sunday-13/05/2012
Timing- 9 to 12 A.M.

Max. Marks-50
Duration -3 Hrs.

Instructions:
1. Figures to the right indicate full marks.
2. All questions are compulsory.
3. Assume Suitable data wherever necessary.
4. Draw neat figure wherever required.
5. Strictly follow the sequence of sub questions for each question.

Q1 A Design a 100 KHz, 60% duty cycle square–wave generator using IC 555 with C=0.47μF. Calculate T_{on}, T_{off}, Total Time, R_A and R_B. **(3)**

B Draw and explain internal functional diagram of IC 8038. **(3)**

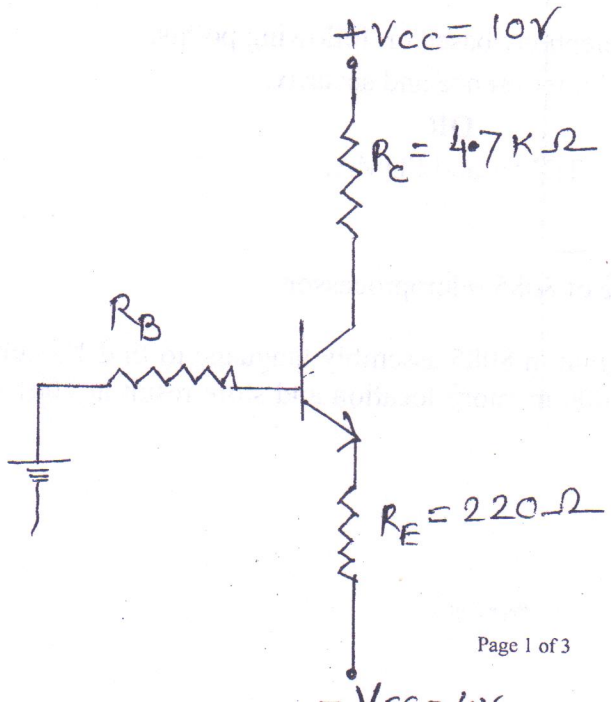
C Derive equation for two input closed loop difference amplifier. **(3)**

D In what way is the voltage follower is the special case of non – inverting amplifier. **(1)**

Q2 A State ideal characteristics of an OP-AMP. State why open loop configuration is not suitable for linear application. **(3)**

B Illustrate the functioning of capacitor filter with proper waveform for bridge rectifier circuit. **(3)**

C For the circuit shown in figure determine values of R_B ,V_{CE} for β= 50 , V_{BE}=0.7 V and I_C = 2 mA. **(4)**



Q.3 A Implement the output D, E, F and G of a logical equation using three half-adder circuits. A, B and C are inputs. **(4)**

D = A XOR B XOR C

$E = \overline{A}BC + A\overline{B}C$

$F = AB\overline{C} + (\overline{A} + \overline{B})C$

G = ABC

B A combinational circuit has four inputs and one output. The output is equal to 1 when **(2)**
(a) all the inputs are equal to 1 or,
(b) none of the inputs are equal to 1 or,
(c) an odd number of inputs are equal to 1.
Obtain the truth table. Find the simplified output function in sum of products.

C Implement the boolean function: **(2)**

$$F = A\overline{B}C\overline{D} + \overline{A}BC\overline{D} + A\overline{B}\overline{C}D + \overline{A}B\overline{C}D$$

with exclusive-OR and AND gates.

D Draw the diagram and truth table of a 4-bit binary ripple counter using T flip-flops. **(2)**

OR

D Write short notes on SISO and SIPO registers explaining the working function and diagram **(2)**

Q.4 A Explain using block schematic the architecture of GSM. **(3)**
Explain significance of different blocks used in the system.

B What is Internet? **(3)**
Describe any two services provided by the Internet from following options: world wide web, e - mail, internet telephony and video conferencing.

C A carrier with rms voltage of 3 V and frequency of 1.5 MHz is modulated by a sine wave of frequency 500 Hz and amplitude 1.5 V rms; calculate modulation index 'm' and write the equation for the resulting AM signal. **(2)**

D Compare Wired and Wireless telephony based on following points: **(2)**
mobility, reliability, radio signal interference and security.

OR

D Explain multiple access systems, TDMA and FDMA. **(2)**

Q. 5 A Draw and Explain flag structure of 8085 microprocessor (2)

B Draw flowchart and write program in 8085 assembly language to find 1's complement of a 8-bit Number stored at 2000h memory location and store result at 2001h memory location (3)