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B.E. /B.TECH.(FULL TIME) DEGREE END SEMESTER EXAMINATION APRIL / MAY 2013
BIOMEDICAL ENGINEERING BRANCH.
SIXTH SEMESTER

EC9081 - MICROCONTROLLER ENGINEERING

(Regulations 2008)

Duration: 3 Hrs.

Max. Mark: 100

Answer All Questions.

Part A

10 X 2 = 20 Marks.

1. Give the difference between a microcontroller and microprocessor.
2. Give the difference between the RISC and CISC processor.
3. List the on chip peripherals of R8C Microcontroller.
4. List the number of interrupts available in R8C Microcontroller.
5. What is hard real time and soft real time system.
6. Give the difference between an assembler and an compiler.
7. Define RTOS.
8. What is scheduling.
9. What is Inter Integrated Circuit?
10. Give the block diagram of microcontroller based digital thermometer.

Part B

5 X 16 = 80 Marks.

- 11(a)(i). With a neat diagram explain timer 1 programming of PIC 18F458 microcontroller. (8 Marks).
- (ii). Briefly explain the ADC Peripherals available in PIC 18F458 microcontroller. (8 Marks).

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b)i) Discuss briefly the construction, working, characteristics and application of SCR (10)

ii) For n-channel JFET $V_p=4V$, $I_D=4mA$ and $I_{DSS}=6mA$. Find gate source voltage. (6)

13. a) i) Explain high frequency analysis of FET amplifier and to obtain cut off frequencies (16)

OR

b) i) Briefly explain emitter follower small signal model and discuss analysis. (10)

ii) Calculate A_v , Z_i , Z_o for a approximate h-parameter CE transistor model with the following components and parameters: $R_1=18k\Omega$, $R_2=8.2k\Omega$, $R_C=5.6k\Omega$, $R_E=2.7k\Omega$, $R_L=68k\Omega$, $h_{ie}=1k\Omega$, $h_{fe}=100$, $h_{oe}=1.67\mu S$. (6)

14. a) i) Sketch the circuit of a BJT unbalanced output differential amplifier and discuss the ac analysis of differential and common mode operation. (16)

OR

b)i) Sketch the circuit of a transformer coupled class A amplifier. Briefly explain the operation of the circuit. (10)

ii) Determine the maximum efficiency of the class A amplifier circuit for the following components $R_1=4.7k\Omega$, $R_2=3.7k\Omega$, $R_E=1k\Omega$ and $R_L=56\Omega$. At Q point $V_{CE}=8V$ and $I_C=5mA$. Assume that the transformer has an 80% efficiency. (6)

15. a) i) Draw the circuit of hartley oscillator and explain its working. Derive the expression for frequency of oscillation (10)

ii) In a hartley oscillator, the value of the capacitor in the tuned circuit is 500pF and the two sections of coil have inductances 38mH and 12 μ H. Find the frequency of oscillations and feedback factor β . (6)

OR

b)i) An amplifier has a midband gain of 125 and a bandwidth of 250kHz. (a) If 4% negative feedback is introduced, find the new bandwidth and gain. (b) If the bandwidth is to be restricted to 1MHz, find the feedback ratio. (8)

ii) What is the effect of a voltage series negative feedback in the following performance measures of a BJT amplifier : (a) input resistance (b) output resistance (8)