Total No. of Questions : 12] SEAT No. :

P763 [Total No. of Pages : 3

[4659] - 108
B.E.(Electronics)
ELECTRONICS SYSTEM DESIGN
(2008 Pattern) (Semester -I)

Time : 3 Hours] *[Max. Marks : 100*

Instructions to the candidates:

1) ***Answer three questions from Section -I and three questions from Section -II.***
2) ***Answers to the two sections should be written in separate books.***
3) ***Figures to the right indicate full marks.***
4) ***Neat diagrams must be drawn wherever necessary.***
5) ***Use of pocket calculator is allowed.***
6) ***Assume suitable data, if necessary.***

SECTION - I

Q1) a) With the help of block diagram, explain different stages of an electronic product development. **[8]**

b) Compare consumer, industrial and military products on the basis of reliability, cost to the performance ratio and temperature range. **[6]**

c) Explain the bath tube curve indicating all its regions. **[4]**

OR

Q2) a) Explain the concept of reliability. Calculate MTBF and reliability for 10,000 Hrs, if the total F.R=2.5×10^{-6} **[8]**

b) Differentiate between Quality and reliability. **[6]**

c) Explain different reliable soldering practices. State their advantages and limitations. **[4]**

Q3) a) Explain typical motor control system using ADC MAX 11046 as data acquisition system. **[8]**

b) Explain the significance of following errors associated with ADC- **[8]**

i) Gain error

ii) Offset error

iii) Non linearity error.

What are the techniques used to minimize these errors.

P.T.O.

OR

Q4) a) What are the factors affecting the choice of op amp in signal conditioning? Explain with the help of example. **[8]**

b) Explain the need of Vref in ADC. Explain the factors to be considered while selecting Vref. Discuss on error budget depending on Vref and no. of output bits. **[8]**

Q5) a) Explain the selection of microcontroller to particular application based on- **[8]**

i) I/O pins.

ii) Counters

iii) RAM & ROM

iv) Architecture

b) Design and explain four channel temperature scanner using AD7817 with any microcontroller. **[8]**

OR

Q6) a) Explain 12C and SPI protocols with application and limitations. **[8]**

b) Design and explain interfacing of 4×4 keypad and 4 wire resistive touch screen with microcontroller. **[8]**

SECTION - II

Q7) a) Explain different phase of software design. **[10]**

b) With the help of suitable example explain in detail how waterfall model is used for software development. **[8]**

OR

Q8) a) Explain in detail debugging tools and techniques for software. **[10]**

b) Write note on- **[8]**

i) Compiler

ii) Emulator

iii) Simulator

iv) Assembler

Q9) a) What are the different PCB Design issues of analog and mixed signal Circuits. Explain in details. **[8]**

b) What are the issues to be considered in ensuring the signal integrity in high speed circuits? **[4]**

c) Write a note on EMI and EMC standards. **[4]**

OR

Q10)a) Explain PCB design rules for grounding and shielding. **[8]**

b) Why bare board testing of PCB is important. **[4]**

c) Two tracks on PCB laminate having thickness of 3.2 mm and $\varepsilon r = 4.7$ and having an overlapping area of 4 cm^2. What will be the capacitance between two tracks. **[4]**

Q11)a) Justify the usefulness of sensitivity analysis with the help of suitable example. **[8]**

b) Why environmental tasting is necessary? How it is carried out? **[8]**

OR

Q12)a) Explain the significance of following specifications of DSO- **[8]**

i) Memory depth

ii) Sampling rate

iii) Bandwidth

b) Explain how debugging of electronics circuit is carried out by logic analyzer. **[8]**

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