

Total No. of Questions : 12]

SEAT No. :

P827

[Total No. of Pages :4

[4659] - 86

B.E. (E. & TC)

ELECTRONICS PRODUCT DESIGN

(2008 Course) (Semester - I)

Time : 3 Hours]

[Max. Marks : 100

Instructions to the candidates:

- 1) *Answer any three questions from each section.*
- 2) *Answers to the two sections should be written in separate books.*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 4) *Figures to the right indicate full marks.*
- 5) *Assume suitable data, if necessary.*

SECTION - I

- Q1)** a) What is failure rate? What are the different types of failure? Write the phases at which the respective failure occurs. [8]
- b) What are the factors responsible for unreliability of Electronic product (any four). [4]
- c) What is exponential law of reliability? How to improve the reliability of electronic product. [6]

OR

- Q2)** a) Define ergonomics. Explain man machine environment (MME) system as a close loop system with appropriate diagram. [6]
- b) A sawtooth wave generator circuit uses following components with failure rates per 10^6 hours mention against them in table. Calculate total FR & MTBF of total circuit. [8]

<u>Components</u>	<u>Quality</u>	<u>FR $\times 10^6$hr</u>
Resistors	10	0.61
Capacitors	5	0.60
Diodes	4	0.20
Transistors	2	0.65
Pulse transformer	2	0.15
Step down transformer	1	0.18

- c) Explain the different stages of electronic product development. [4]

P.T.O.

- Q3)** a) An 8-channel ADC reads data using LM35. This data is to be logged in system RAM & a plot is drawn using a plotter. [10]
- i) Draw the block schematic of suggested DAS for above design requirement.
 - ii) Draw the flow chart for acquiring data & displaying it on a sixdigit multiplexed LCD display and print the output in plotter or printer.
 - iii) Explain the steps necessary to develop the s/w for proposed DAS.
- b) Explain IA with an important four specifications (Draw 3 - OPAMP configuration IA). [8]

OR

- Q4)** a) What are the different I/o devices interfaced with microcontroller? Explain any one I/f with 8051 MC. [8]
- b) Compare any three microcontrollers (8 bit) on the basis of ROM, RAM, I/o pins & ports. State the main features of HB LED. [10]

- Q5)** a) Discuss the different topologies of touch screen. State the advantages & disadvantages of each. Explain any one technology in detail. [8]
- b) Explain & specify the following protocols & buses used in microcontroller based project design. [4]
- i) I2C
 - ii) RS232
- c) Discuss the criterion for LCD selection w.r. to microcontroller (any) in short. [2]

OR

- Q6)** a) What parameters are to be considered while selecting high speed OPAMPS? Give any two applications of such OPAMPS. [4]
- b) For the mini project that you designed justify [8]
- i) Selection of microcontroller.
 - ii) Selection of I/P & O/P devices.
 - iii) Type & size of memory.
 - iv) Controlling element if any.
- c) Explain different factors considered while selecting ADCs for any microcontroller based product in short. [2]

SECTION - II

- Q7)** a) Classify the different software development approaches. Explain with blocks the water fall model. [6]
- b) What is the role of simulator in software design? List the different simulation tools with their application domain. [6]
- c) What is an emulator? Explain with block diagram the ICE. [6]

OR

- Q8)** a) What is the necessity of hardware test programs? Explain POST, Inquisitor, HLL as H/W test utilities. [6]
- b) Compare the following (any two)
- i) High level language & low level language. [6]
 - ii) Assembler & compiler.
 - iii) Flow chart with pseudo code.
- c) Write short note on (any two) [6]
- i) UMPS or IDE
 - ii) Dibugger or OCD.
 - iii) Top down approach.

- Q9)** a) What problems are avoided while designing PCBs for digital circuits? What is cross talk? How to minimise the cross talk in designing PCBs. [8]
- b) In a multilayer PCB, signal & ground plane is separated by 0.5 inch, common area of two planes is 5.25 inch². Then find the parasitic capacitor for relative permittivity & substrate $r = 2.5$. [4]
- c) What methods are used to minimise the EMI/RFI effects from compliance testing point of view. [6]

OR

- Q10)**a) Define the following terms w.r.to printed circuit board (any four) [8]
- i) Copper clad laminate
 - ii) Photo resist
 - iii) Vias
 - iv) Etching
 - v) Solder mask

- b) Compare between single sided & double sided PCBs. [4]
- c) Explain the PCB design considerations for digital circuits. [6]

Q11)a) Explain the following parameters & also indicate their importance in case of RF link design. [8]

- i) SINAD
- ii) Fade margin

b) Explain the detail working of Digital PLL. [6]

OR

Q12)a) With reference to RF link analysis explain path loss & free space loss. [6]

b) Discuss the design considerations of the following blocks of communication systems

i) Interleaver

ii) Equalizer. [8]

