

**B.TECH SEM – VI (2007 COURSE) (ELECTRONICS) :**  
**WINTER - 2017**

**SUBJECT: CIRCUIT DESIGN**

Day: **Thursday**  
Date: **23/11/2017**

Time: **10.00 AM TO 01.00 PM**  
Max. Marks: 80

**W-2017-2517**

**N.B.:**

- 1) **Q. No. 1 and Q. No. 5 are COMPULSORY.** Out of the remaining attempt any **TWO** questions from each section.
- 2) Figures to the right indicate **FULL** marks.
- 3) Answers to both the sections should be written in **SEPARATE** answer book.
- 4) Draw neat diagrams **WHEREVER** necessary.
- 5) Assume suitable data if necessary.

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**SECTION-I**

- Q.1 a)** Draw and explain 'cost design characteristics curve'. **(04)**
- b)** Design a voltage regulator using IC-723 which gives a 5V output. The maximum load current is 120mA. Foldback current limiting is to be provided with  $I_{SC} = 60\text{mA}$ . Assume  $V_{\text{sense}} = 0.6\text{V}$ . **(06)**
- c)** Draw block diagram of 'Data Logger' and explain it. **(04)**
- Q.2 a)** What is reliability and repeatability? Compute the reliability of a component **(07)**
- i) When the time of operation equals the MTTF.  
ii) When the time of operation equals 0.2 of MTTF ( Mean Time to Failure).
- b)** Describe 'Bath Tub Curve' with the help of suitable diagram. **(06)**
- Q.3 a)** Design a adjustable voltage regulator using LM- 317 to meet the following **(07)**  
specification:  
 $V_0 = 5$  to  $10\text{V}$   
 $I_0 = 0.8\text{A}$ . The regulator is close to power supply filter capacitor.
- b)** Draw and explain step- up switching regulator. **(06)**
- Q.4 a)** Draw and explain signal conditioning circuits used in DAS. **(07)**
- b)** Describe 'Multi-channel DAS' with the help of block diagram. **(06)**

**P. T. O.**

## SECTION-II

- Q.5** a) Draw and explain various notations used in ASM chart. (06)  
b) Explain 'continuous and discrete process control'. (04)  
c) Draw and explain 'Display system used in Annunciator'. (04)
- Q.6** a) Draw and explain ladder diagram for bottle filling plant. (07)  
b) Describe PLC with the help of block diagram. (06)
- Q.7** a) Develop an ASM chart for traffic signal controller at the intersection. The green/ red light should be 'ON' for 30 sec and yellow light should be 'ON' for 5Sec. Make provision for an emergency vehicle to pass through by stopping traffic if required. (07)  
b) Describe 'State Machine' and 'State diagram' with example. (06)
- Q.8** a) Design an Annunciator system, which will give the following indications: (09)  
i) If temperature of the system is above  $70^{\circ}\text{C}$  then RED LED should glow.  
ii) If temperature of system is below  $70^{\circ}\text{C}$  then GREEN LED should glow.  
b) Draw a block diagram of Annunciator system and explain it. (04)

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