

B.TECH SEM – VI (2007 COURSE) (ELECTRONICS) :
SUMMER - 2018
SUBJECT : CIRCUIT DESIGN

Day : **Friday**
Date : **08/06/2018**

S-2018-2722

Time : **02.30 PM TO 05.30 PM**
Max. Marks : 80

N.B.

- 1) **Q.1 and Q.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) Use of non-programmable calculator is allowed.
- 5) Assume suitable data if necessary.

SECTION – I

- Q.1**
- a) Define : i) Reliability ii) Availability. (05)
 - b) Draw and explain functional block diagram of IC μ A 78s40. (05)
 - c) Draw and explain working of 'Data Loggers'. (04)
- Q.2**
- a) What is ergonomics? Describe it in detail. (07)
 - b) Define : i) MTTF, ii) Failure rate. (06)
Also compute the reliability of component:
i) When the time of operation equals the mean time to failure.
ii) When the time of operation equals 0.1 of MTTF.
- Q.3**
- a) Design a step down switching regulator using IC μ A 78s40 for the following (08)
specifications: $V_{out} = 5.0$ V, $I_{out} = 50$ mA, $F_{min} = 50$ KHz.
 $V_{in(min)} = 24$ V-10% or 21.6 V
 $V_{ripple(p-p)} = 0.5\%$ V_{out} or 25 mV_{p-p}.
 - b) Draw step-up switching regulator and describe its operation. (05)
- Q.4**
- a) Draw and explain various signal conditioning circuits used in DAS. (07)
 - b) Draw block diagram of DAS and explain its working. (06)

SECTION – II

- Q.5**
- a) Draw block diagram of PLC. Describe its operation. (06)
 - b) Compare continuous and discrete process control. (04)
 - c) Draw and explain annunciator system. (04)
- Q.6**
- a) Develop ASM chart for ATM, which will dispense the cash if customer (07)
enters correct password and correct amount.
 - b) Compare ASM chart and flow chart. (06)
- Q.7**
- a) Develop ladder diagram for elevator system. (07)
 - b) Draw standard symbols used in preparing the ladder diagram. (06)
- Q.8**
- Design annunciator system for the following specifications: (13)
- i) If temperature $< 70^{\circ}$ C, Green LED should glow.
 - ii) If temperature $> 70^{\circ}$ C, RED LED should glow.