[Total No. of Printed Pages:2] **CODE NO:- Z-383**

FACULTY OF ENGINEERING &TECHNOLOGY

T.E. Engg.(EC/ECT/E&C/IEC) Year Examination-June-2015

Electronics System Design

(Revised)

Time: Three Hours **Maximum Marks: 80**

"Please check whether you have got the right question paper."

i) Q. No. 1 and Q. No. 6 are compulsory.

ii) Solve <u>any two</u> questions from Q. 2, Q. 3, Q. 4 and Q. 5 in section A.

iii) Solve <u>any two</u> questions from Q.7, Q.8, Q.9 and Q.10 in section.

iv) Figure to right indicates full marks.

v) Use standard 5% tolerance resistance value=(10,11,12,13,15,16,18,20,22,24,27,30,36,39,43,47,51,56,62,68,75,82,91) & standard capacitance values=(10,12,15,18,22,27,33,39,47,56,68,82) in design.

vi) Assume suitable component & data wherever necessary and mention it clearly.

vii) Design of liner power supply must include circuit diagram, selection of transformer, rectifier diodes, filter capacitor, capacitor at input and output terminal of 3pin regulators, protection diodes etc.

SECTION-A

Q.1 Solve (<u>any two</u>) 10

1) Discuss the various types & selection criteria in design for resistors.
2) Explain the types & selection criteria for transistors in an electronic circuit design.
3) Derive the output equation of opamp based integrator.
4) Explain how overvoltage & over current protection for a voltage regulator can be done.

Q.2 a) Design a regulated variable DC power supply using LM 317 with given specifications: $V_o = 3V\ to\ 20V$, load current = 0.5A. 07

b) Design a regulated DC power supply with given specification: $V_o = \pm 12V$, load current=$\pm 1A$.(use 7812 & 7912) 08

Q.3 a) Using an op amp design a grounded load voltage to current amplifier with the following specifications:$I_i = V_i/1\ K\Omega$. also find the voltage compliance 07

b) Design an integrator circuit, with A_{DC}=20 to integrate square waves input of 50 KHz. Draw the input and output waveform one below the other. 08

Q.4 a) List the features, absolute maximum ratings and electrical characteristics of IC temperature sensor LM 35 07

b) List the electrical characteristics of photo diodes and photo transistors. 08

Q.5 a) Design a bass/treble control circuit using LM 833 with following specifications: $f_\beta = 20\ Hz,\quad f_T = 12\ kHz\ and\ \pm 20\ dB$ maximum boost/cut at both ends. 07

b) Discuss Auto zero phase, signal integrate phase and de-integrate phase which is used in IC 7106/7107. Also draw the typical integrator amplifier output waveform (at INT pin) 08

SECTION-B

Q.6		Solve (<u>any two</u>)	10
		1) Explain the various modes for heat transfer in heat sink design	
		2) Explain PCB design rule for digital circuits.	
		3) Explain the various noise energy coupling mechanisms in circuit	
		4) Draw and explain the block diagram of mealy model for sequential circuit design.	
Q.7	a)	Design a monostable multivibrator using IC 555 with following specifications: V_{cc}=5V, pulse width= 1msec. draw the wave form one below the other at pin no's 2,7 and 3	07
	b)	Draw and explain the block diagram of LM 656.	08
Q.8	a)	Explain interfacing of optocoupler to digital circuits by drawing a neat circuit diagram	07
	b)	Design divide by 6 counter using IC 7490	08
Q.9	a)	Explain exponential law of reliability.	07
	b)	Find out failure rate if 10,000 microcontroller chips are operated for a period of 1000 hours out of which 10 fail.	08
Q.10	a)	Discuss the various types of signal grounds.	07
	b)	Explain in detail guarding.	08