ID.No./Seat No. 09EL112

MEHRAN UNIVERSITY OF ENGINEERING AND TECHNOLOGY, JAMSHORO.

SECOND TERM SECOND YEAR (4TH TERM) B.E.(ELECTRICAL) REGULAR EXAMINATION 2010 OF 09-BATCH.

APPLIED ELECTRONICS

Dated: 02-12-2010. Time Allowed: 03 Hours. Max.Marks 80

NOTE: ATTEMPT ANY **FIVE** QUESTIONS.

Q. No.			Marks
01	(a)	How phototransistor differs from light dependent resistor (LDR). Explain your answer enlisting characteristics with relative advantages and disadvantages.	[08]
	(b)	Explain the difference between positive temperature coefficient (PTC) of resistance and negative temperature coefficient (NTC) of resistance of ~~resistor~~ and thermistor respectively with the help of neat and clean graphs to support your answer.	[08]
02	(a)	Enlist the factors on which various amplifiers are classified? Describe the working and circuit action of common emitter (CE) amplifier.	[05]
	(b)	Compare the characteristics of common base (CB), common emitter (CE) and common collector (CC) amplifier configurations.	[05]
	(c)	For the transistor amplifier as shown in figure (1), calculate the voltage gain without and with the load resistor of 500 Ω.	[06]

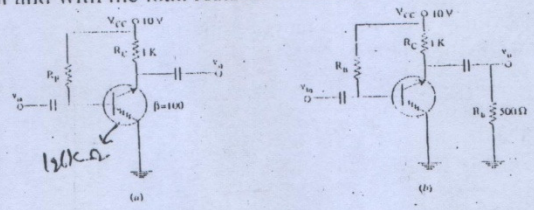

Figure 1

03	(a)	Why the feedback circuit is important in amplifiers? Discuss the principle of operation of feedback amplifiers with relative advantages and disadvantages of negative feedback amplifiers.	[05]
	(b)	Derive the output expression of gain stability of negative feedback amplifier.	[03]
	(c)	In the series parallel (SP) feedback amplifier as shown in figure (2), calculate I. Open loop gain of the amplifier II. Gain of the feedback network III. Close loop gain of the amplifier IV. Sacrifice factor, S	[08]

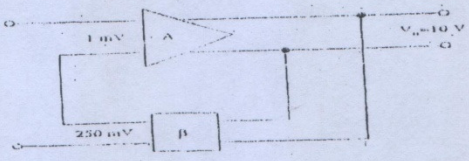

Figure 2

Cont'd on P/-2...

04 (a) List the ideal and typical characteristics of an operational amplifier. [04]

(b) Derive expressions for the input and output impedances of an op-amp based non-inverting amplifier. [06]

(c) Determine the input and output impedances of the operational amplifier as shown in figure (3). The operational amplifier data sheet gives Zin = 5 MΩ, Zout = 100 Ω, and A_{ol} = 200,000. Also, find the close loop voltage gain. [06]

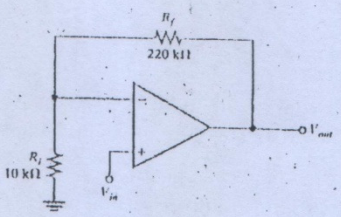

Figure-3

05 (a) Define oscillator? Give comparison between an amplifier and an oscillator. [04]

(b) Elucidate the difference in working principle of Collpit oscillator and RC phase shift oscillator. Enlist their characteristics with relative advantages and disadvantages. [08]

(c) Discuss the damped and undamped oscillations. Draw neat and clean waveforms in context of your answer. [04]

06 (a) Define active filter? Discuss its purpose and various types. Draw suitable circuit diagrams and waveforms. [08]

(b) A series RLC band stop filter consist of R= 2 kΩ, L= 0.1 mH, C= 40 pF, determine [08]

I. The center frequency
II. The bandwidth
III. The quality factor

07 (a) What is thermal resistance and how it affects the insulating materials? Discuss the important implications of cooling and heating sinks in power applications. [08]

(b) Define electromagnetic interference (EMI). Describe the various forms at which EMI appears. Also describe the different causes of EMI and their possible solutions. [08]

08 Discuss any three of the following; [16]

I. Monostable Multivibrator
II. Inverting and non-inverting op-amp based integrators.
III. Comparison between positive and negative feedback amplifiers
IV. Magnetic amplifier

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I.D.No./Seat No.

MEHRAN UNIVERSITY OF ENGINEERING AND TECHNOLOGY,
JAMSHORO.

SECOND TERM SECOND YEAR (4TH TERM) B.E.(ELECTRICAL) REGULAR EXAMINATION 2008 OF 07-BATCH

APPLIED ELECTRONICS

Dated: 03-12-2008. Time Allowed: 03 Hours. Max.Marks 80

NOTE: ATTEMPT ANY FIVE QUESTIONS. ALL QUESTIONS CARRY EQUAL MARKS.

Q.No.

01 (a) Define the term solar cell. Discuss the construction, principal of operation, relative merits, demerits and its applications. Also draw the V-I characteristics of photo cell.

(b) A relay is to be control by photo-voltaic cell having a dark resistance of 100 kilo-ohms of 1 kilo-ohm when illuminated with 400 lumens/ m^2. The relay is to be supplied with 8mA from a 24V battery. When the cell is to be de-energized it is on dark and is illuminated with 400 lumens/m^2. Calculate the required-series resistance and dark current.

02 (a) With the help of constructional features explain the action of control gird, discuss Static and dynamic characteristics of vacuum triode.

(b) The plate current in a diode is 10 m A at the plate voltage of 100 V, When operates in the space limited region. What is the plate voltage necessary to double the current?

03 (a) Discuss the positive and negative feedback amplifiers and mention the four basic forms of negative feedback and also give the advantages of negative feedback.

(b) An amplifier having a gain of 700 without feedback has an over all negative feedback applied which reduces the gain to 175. Calculate the fraction of output voltage fed back. If due to ageing of components, the gain without feedback falls by 15%, calculate the percentage fall in gain with feedback.

04 (a) Describe different modes of operation of an op-amp. Derive the equation of the gain of an inverting & non inverting integrator op-amp.

(b) Determine input and output impedance of amplifier as shown in figure (1). The Op-amp data sheet gives Z_{in} = 5 M Ω, Z_{out} = 85 Ω and A_{ol} = 400000. Find the closed loop voltage gain.

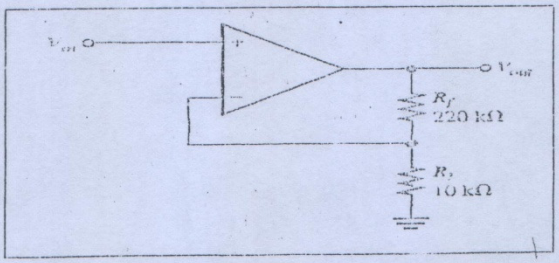

Figure (1)

Cont'd on P/-2....

05 (a) Explain, how an op-amp is used as comparator? Describe the zero-level and non zero-level detector using op-amp.

(b) The input signal in Figure 2(a) is applied to the comparator circuit in Figure 2 (b). Draw the output showing its proper relationship to the input signal. Assume the maximum output levels of the op-amp are:±12 V.

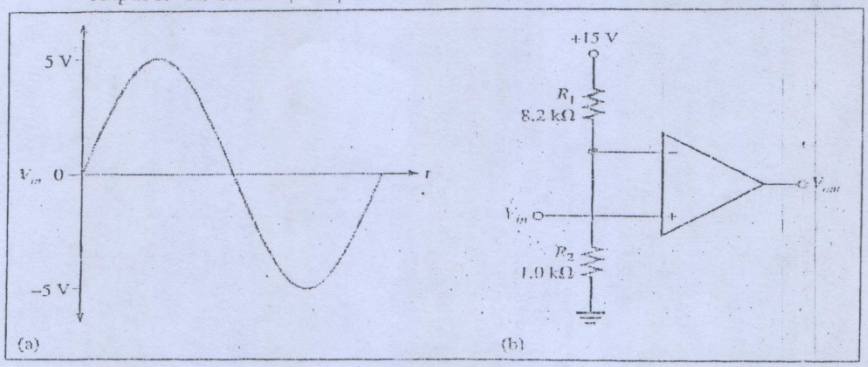

Figure (2)

06 (a) Discuss damped and undamped Oscillation, what are conditions for oscillation in a feedback circuit. With the help of circuit diagram explain the working of tuned collector oscillator.

(b) A tuned collector oscillator has a fixed inductance of 150μH and is tunable over the Frequency band for 570 KHz to 1570KHz. Find out the range of variable capacitor.

07 (a) What is an electric filter? Explain briefly all the basic filter types with the help of neat and clean sketches.

(b) Determine the center frequency of, maximum gain and band width for the filter in Figure (3) as shown

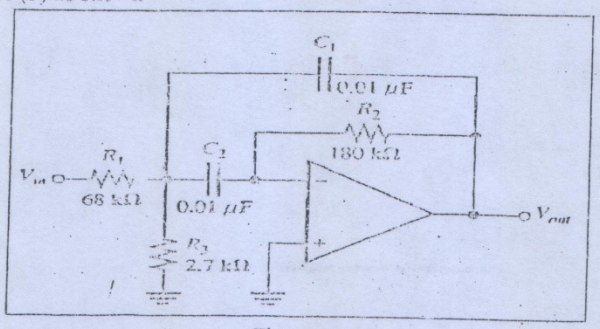

Figure (3)

08 (a) Describe the electrical model of heat transfer and how you will design the Cooling system for any solid state power device.

(b) Define Electromagnetic interference and Noise and discuss the methods of minimization and elimination of interference.

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