

DTEMS PAST PAPER

TECHNICAL

SIR ARTHUR LEWIS COMMUNITY COLLEGE  
DIVISION OF TECHNICAL EDUCATION AND MANAGEMENT STUDIES

EXAMINATION SESSION : May 2015 Final Examination  
TUTOR : Lindsley Philbert  
PROGRAMME CODE : 3EE ESC-AD  
COURSE TITLE : Electronics III  
COURSE CODE : ELE 208  
CLASSES : Electronics Engineering YR 2  
DATE : Wednesday 6<sup>th</sup> May, 2015  
COMMENCEMENT TIME : 1:00 pm  
DURATION : 2 ½ Hours  
INVIGILATORS : K. Numa, F. Nicholas  
ROOM : TRA-R3



#E91

---

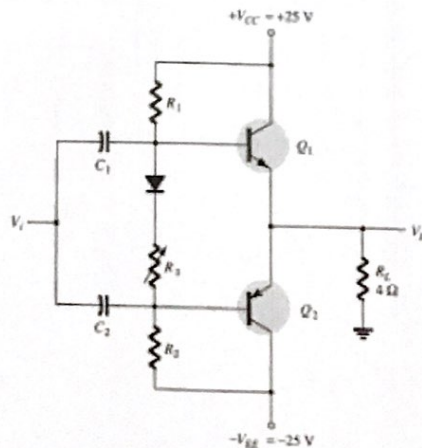
INSTRUCTIONS

Answer all Questions

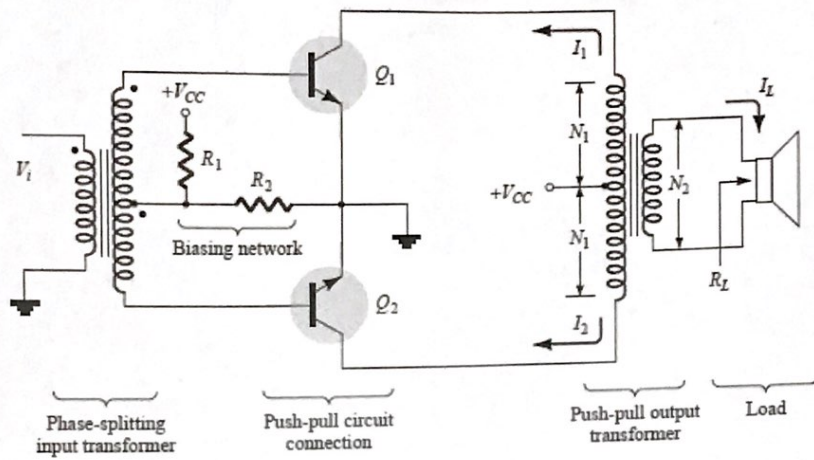
All working must be showed

Questions should be properly labeled.

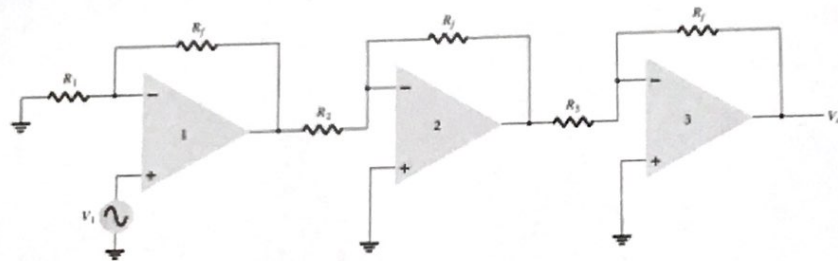
- 1a Draw labeled circuit diagrams of:
- An integrator op-amp circuit
  - A differentiator op-amp circuit
- (6mks)
- b. An inverting amplifier has resistors value of  $R_1 = 36K$  ohms and  $R_f = 750K$  ohms. Draw the circuit and determine the voltage gain. If  $200mV$  is applied to the input calculate the output voltage. (5mks)
- c. Apply the values given above to a non inverting amp and determine the gain and output voltage if  $V_{in} = 240mV$ . Sketch the Circuit. (5 marks)
- d. A summing amplifier with three inputs has values of  $R_1 = R_2 = R_3 = 3k$  Ohms. If  $R_f = 15k$  ohms calculate the voltage output when all inputs are at  $50mV$ . (4mks)
- 2a Three Op amps are connected in Series.  $R_f = 470K$  ohms in all cases  
 Op-amp1: Non inverting with  $R_1 = 4.3K$  ohms  
 Op-amp2 and 3: Inverting with  $R_1 = 33k$  each.
- Determine the gain of the cascaded amplifier and,
  - The output voltage when the input is  $80$  micro volts
  - Sketch the circuit
- (7mks)
- b. Draw circuits of a High-Pass and Low-Pass filter circuits and discuss how the cut off frequencies are achieved. (8mks)
- c. Explain how you can use an Op-Amp circuit to turn a relay ON and OFF with the presence and absence of a voltage of  $200mV$ . (5mks)
- 3 List 4 classes of amplifier and discuss each type. Use diagrams where possible (20 mks)
4. a. With the use of suitable diagrams discuss the concept of Cross-Over distortion in power amplifiers, and explain how the problem can be solved. (12 mks)
- b. Identify the components in the circuit below used to correct cross over distortion. What is the minimum voltage drop across those components? (4mks)



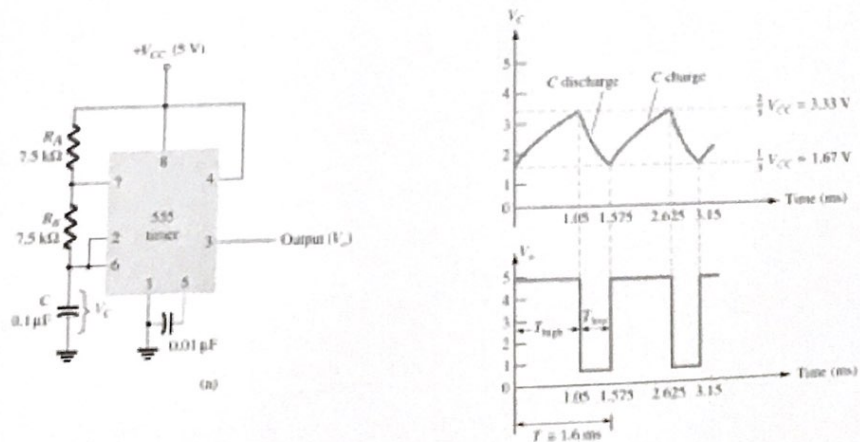
- c. Describe the operation of a Quasi-Complementary Push Pull Amplifier. Use diagrams to illustrate. Use NPN transistors for your description. (8 mks)
- c. Describe the operation of the Amplifier shown below. (8mks)



5. Calculate the output voltage for the circuit below.  $R_f = 47k$ ,  $R_1 = 4.3K$ ,  $R_2 = 33K$  and  $R_3 = 33K$ . The input is 80 microVolts (8mks)



6. Determine the frequency of operation for the Astable Multivibrator shown below (6mks)



End of Examination