

## POKHARA UNIVERSITY

Level: Bachelor

Semester – Spring

Year : 2010

Programme: BE

Full Marks: 100

Course: Electronic Circuits

Pass Marks: 45

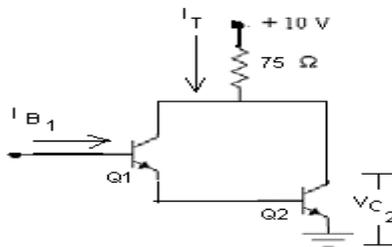
Time : 3hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

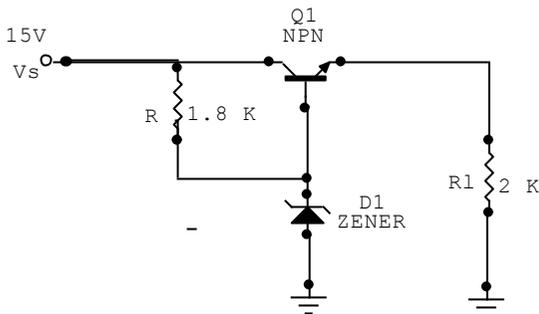
**Attempt all the questions.**

1. a) Why Darlington pair is regarded as super Beta transistor? The transistors in the Darlington pair amplifier shown in figure have  $\beta_1 = 80$  and  $\beta_2 = 100$ . Using the same approximation used in the Darlington pair amplifier analysis, find  $r_{in}$ ,  $r_{out}$ ,  $A_i$  and  $A_v$ . 8



- b) Define shunt capacitance, using effect of shunt effect of shunt capacitance find the expression for the high frequency response. 7
2. a) Explain how two complementary transistors in class B push-pull amplifier act simultaneously as phase inverters and output push-pull amplifier. 7
- b) Why Voltage-Series feedback is most commonly used in cascaded amplifier? A single stage amplifier has a voltage gain of 10 and a bandwidth of 1MHz. Three such stages are cascaded and negative feedback of 10% is applied to the cascaded stage. Find the overall voltage gain and bandwidth of the cascaded stage with feedback. 8

3. a) Design suitable oscillator for the frequency range of 1 Hz to 10 MHz. 8
- b) Explain the principle operation of Schmitt Trigger with neat circuit diagram and waveform. 7
4. a) Design an Operational amplifier circuit to produce output  $V_O = -8V_1 + 5V_2 + 0.5V_3 - 4V_4$ . 5
- b) Write the characteristics of the ideal op-amp. Also prove that “integrator convert periodic even signal to odd periodic signal.” 5
- c) How does an oscillator differ from an amplifier? What are the essential parts of an oscillator circuit? 5
5. a) Define logarithmic amplifier and derive the expression for anti-log amplifier. 7
- b) Find the successive approximation A/D output for a 4 bit converter to a 3.217 V input with reference voltage,  $V_R = 5V$ . 8
6. a) What is a regulated power supply? Calculate the output voltage and Zener current in the regulator circuit as shown. Let  $V_Z = 8.3V$  and  $\beta = 100$ . 8



- b) Design the complete 3 bit flash A/D converter with detail truth table. 7
7. Write short notes on **any two**: 2×5
  - a) Differential amplifier
  - b) Voltage controlled oscillator

c) Instrumentation amplifier