



Notes:

Time: 1 Hour

a. Each question carries 30 marks.

Full Marks: 60

b. Figure on the right of each question indicate marks for respective question.

ANSWER ANY TWO QUESTIONS INCLUDING QUESTION NO. 1

1. (a) Find the output voltage of the following circuit of Fig. 1(a). If feedback resistor  $R_f$  is increased to  $20K\Omega$  then what will be the output voltage? Comment on the value of output voltages for both cases. 15

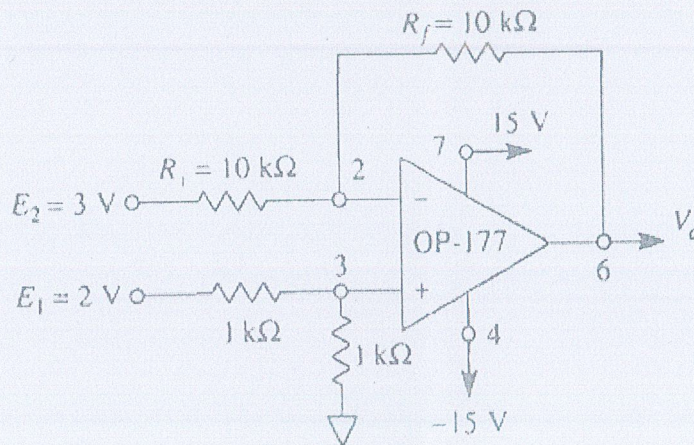


Fig. 1(a)

- (b) Find the output of the following circuit of Fig. 1(b). 15

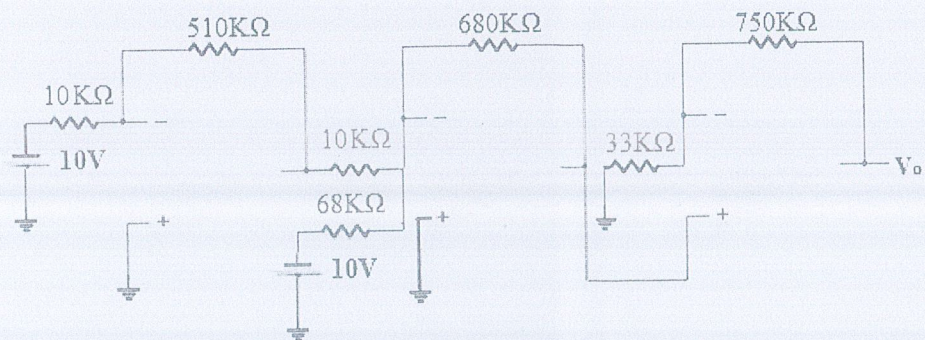


Fig. 1(b)

2. (a) Draw the equivalent circuit of an ideal op-amp. What are the properties of an ideal op-amp? 10
- (b) Write short note on: Unity gain amplifier, slew rate, CMRR, SVRR, input offset voltage. 15
- (c) Draw and explain the internal block diagram of an op-amp. 5
3. (a) "Open loop voltage gain of an op-amp is dependent on frequency"- justify this statement. 15
- (b) Show that, Gain of a non-inverting amplifier,  $A = 1 + (R_f / R_1)$  15