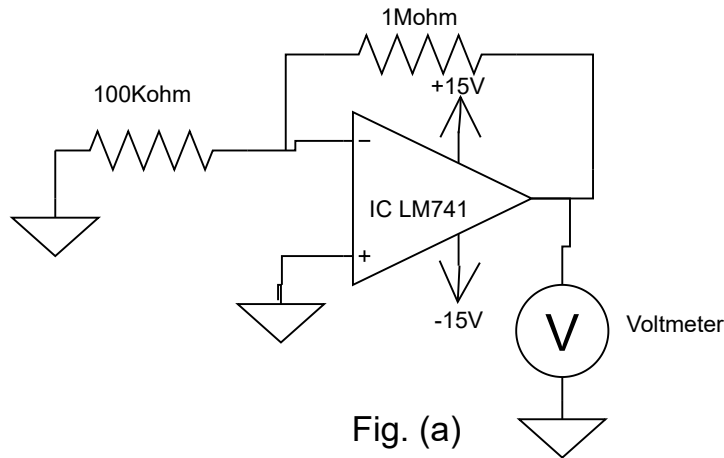


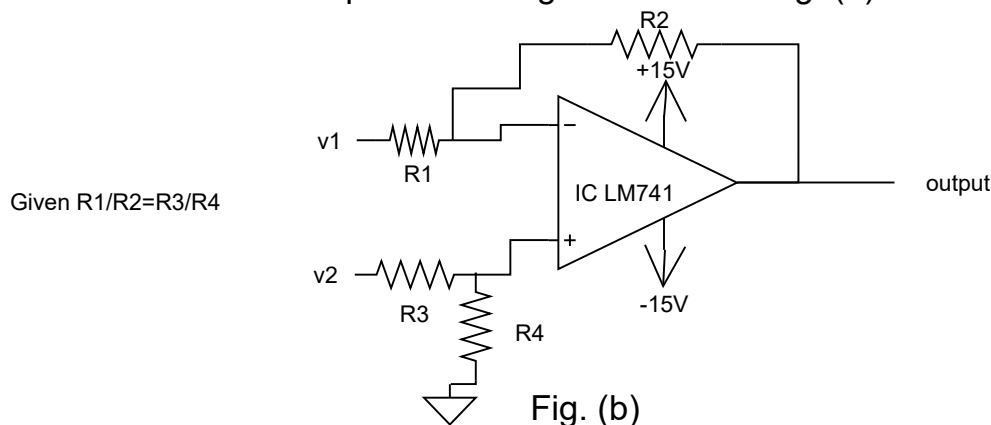
Q1. An engineer is trying to measure a parameter of the Op-Amp, whose experimental set up is given below in Fig. (a), explain which parameter is being measured?

1.5 Marks



Q2. Consider a difference amplifier circuit given below in Fig. (b): -

3.5 Marks



(a) Can you obtain variable gain in the above amplifier practically by connecting a suitable potentiometer across the relevant resistor arms?

3.5/3 Marks

(b) What is the input impedance of the above difference amplifier, also explain the relation between gain and input impedance of the amplifier?

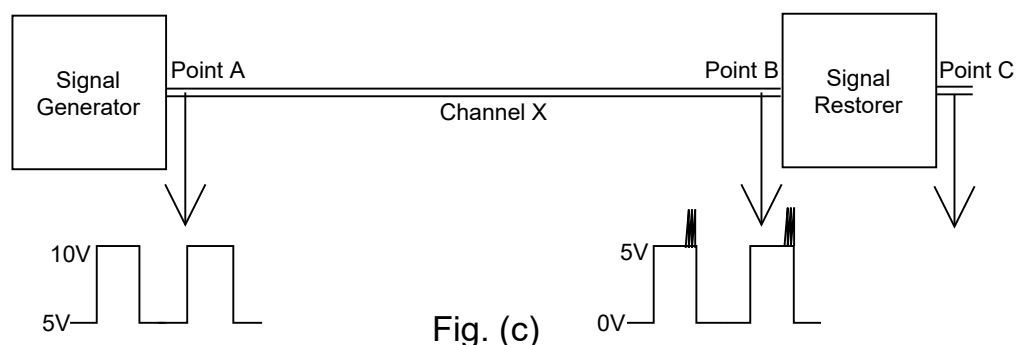
3.5/3 Marks

(c) Propose a circuit which can overcome the challenges in part (a) and (b).

3.5/3 Marks

Q3. Consider a part of the electrical signal transmission sytem below in Fig. (c): -

2 Marks

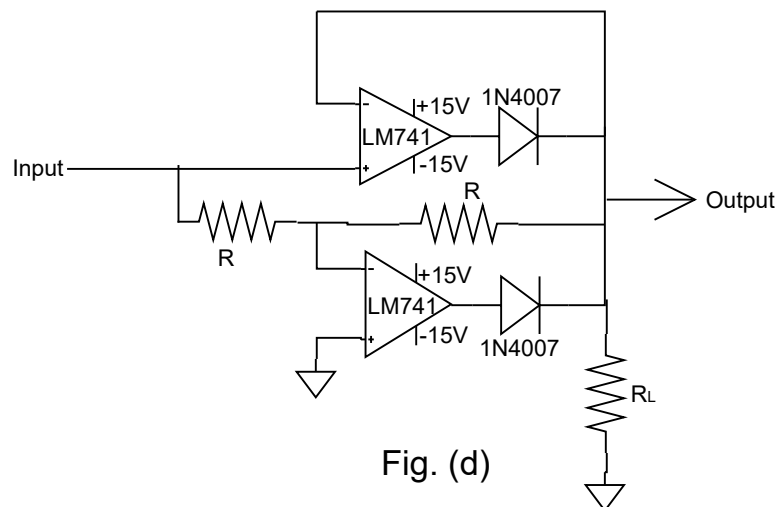


## Basic Electronics Lab Assignment

In the above system in Fig. (c), signal generator is transmitting a square pulse having its lowest level at 5V and highest at 10V. Because of the transmission over the channel X, the signal suffers distortion which causes its DC level to be shifted down, also some of the noise has been introduced in the pulse which is represented in the form of overshoot at 'Point B', propose a circuit block (in terms of block diagram) to be implemented in the signal restorer block so that, at 'Point C' we must get exactly the original pulse back which was at 'Point A'.

Q4. Consider the circuit below in Fig. (d): -

3 Marks



(a) "Above circuit nullifies the offset effects in normal rectifier circuits because of the cut-in voltages of the diodes", give your explanation for the same.

1 Marks

(b) In normal rectifier circuits (which does not use Op-Amps) if you will provide at the input a sinusoidal wave of 10mVpp then what will be the output if it is full wave rectifier? Now if same sine input is given to the above circuit in Fig. (d) then what will be the output, draw the output waveform in both the cases and comment on your results.

1 Marks

(c) Mention at least one application of the above circuit.

1 Marks

Q5. State one application for each type of diode with its respective symbol.

3 Marks

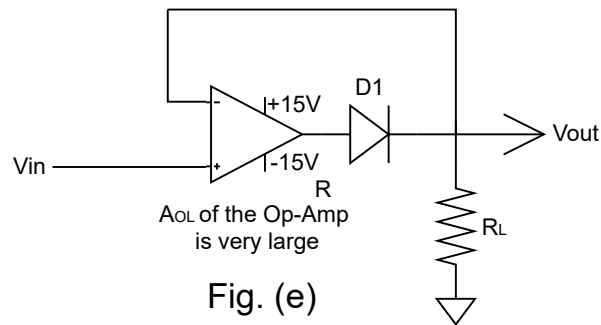
- Zener diode
- Gunn diode
- Barrett diode
- Varactor diode
- Shockley diode
- Schottky Diodes
- Light emitting diode
- LASER diode
- Photodiode
- PIN diode
- Fast recovery diode
- Tunnel diode
- Step recovery diode

3/13 each

## Basic Electronics Lab Assignment

Q6. Consider the circuit given below in Fig. (e)

3.5 Marks



(a) What are the important parameters to be considered in Fig.(e) while selecting a diode and a resistive load for the above rectifier circuit?

1.5 Marks

(b) Simulate the above-mentioned circuits in Fig (e). Test the circuit at these value of parameters given below:

2 Marks

$R_L = 100$  and  $R_L = 1K$

Frequency: 1KHz

Op-amp: LM741

Diode: 4148

Q7. What is the best possible solution to rectify a signal less than the cut-in voltage of a diode in the rectifier circuits?[Hint: Op Amp]

1.5 Marks

Q8. What are the two most important parameters to be considered while choosing an op-amp?

2 Marks