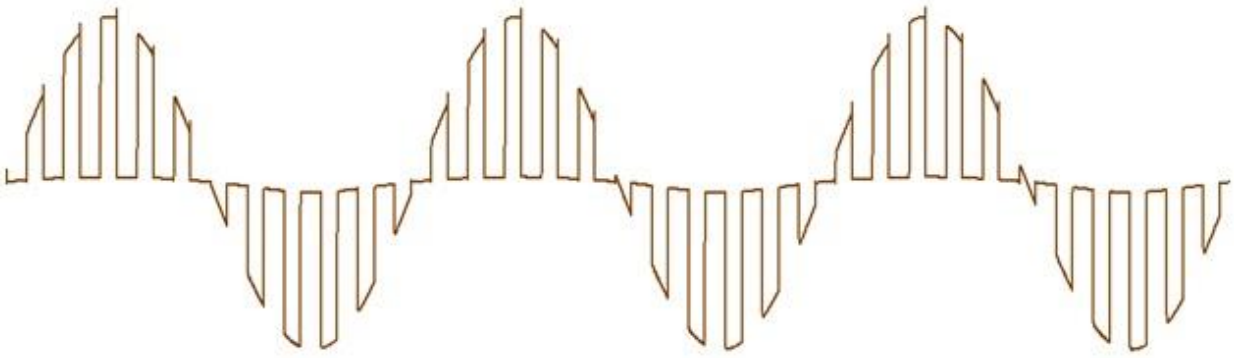
SUBJECT: Principle of Communications(PCE)

TOPIC: Pulse Amplitude Modulation(PAM)

CLASS: SE EXTC-A

MEMBERS:

SR.NO	NAME	ROLL.NO
1	Prajakta Lonkar	16104A0068
2	Savita Sonwane	16104A0071
3	Saili Panchal	16104A0066



INTRODUCTION

- In PAM system, the amplitude of the pulsed carrir is changed in proportion with the instantaneous amplitude of the modulating signal x(t). So the information is contained in the aplitud evariation of PAM signal.
- The carrier is in the form of train of narrow pulses as shown below-

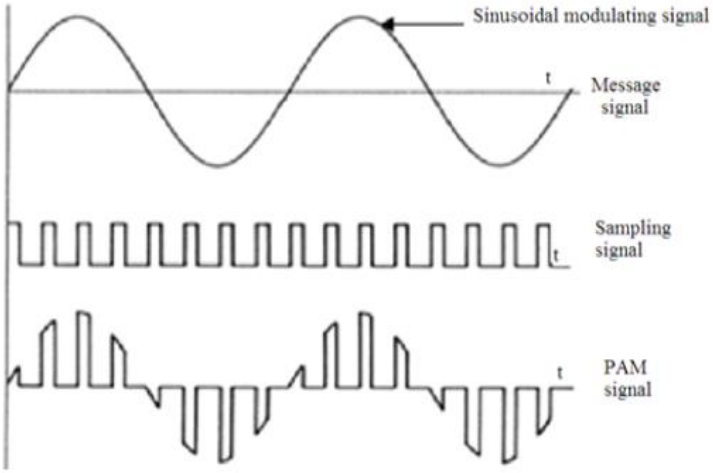
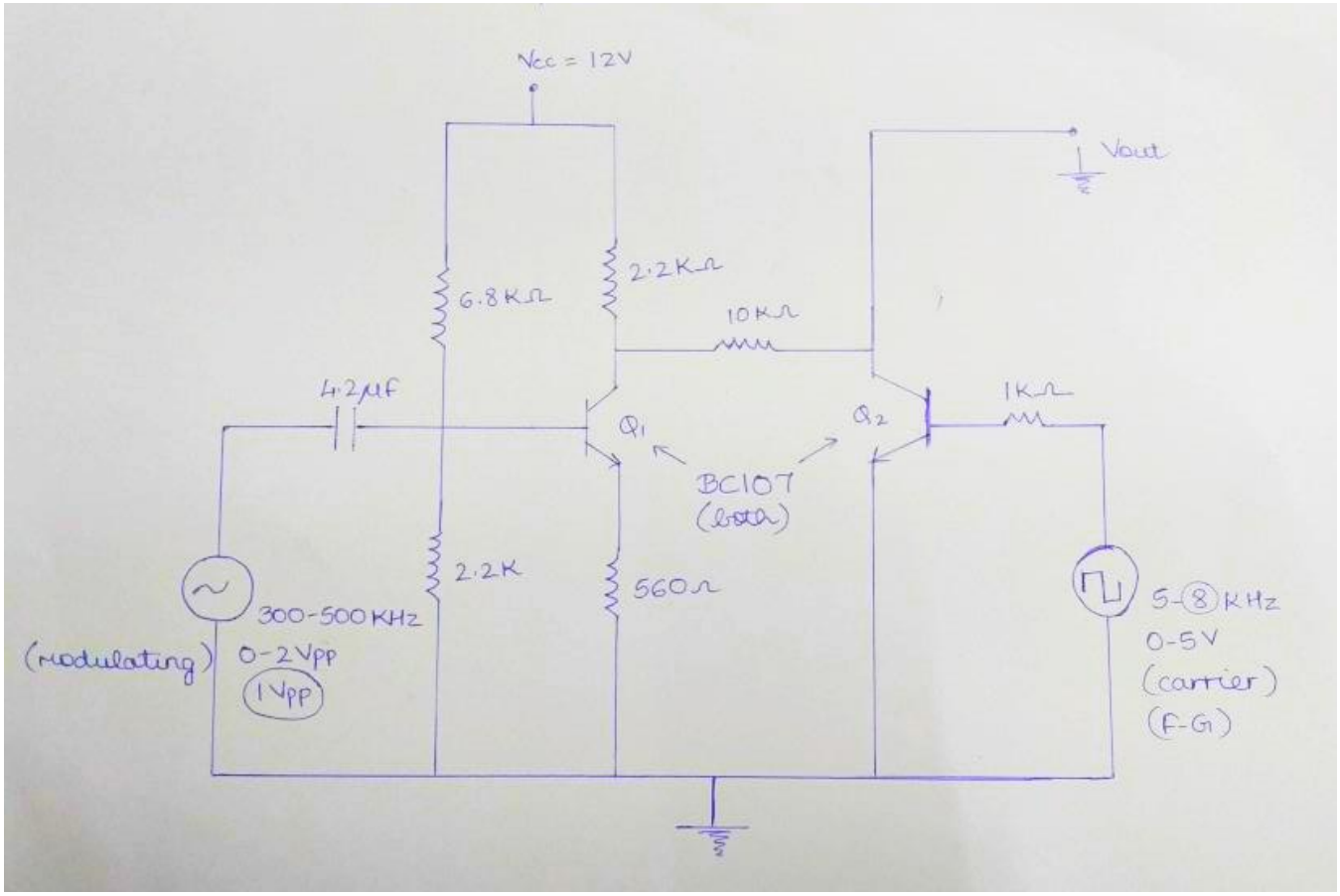


Fig2. Spectrum of PAM signal

- If we compare the process of PAM system with the sampling process, we will find that these two processes are identical.
- The PAM signal is the sent by either wire or cable or it is used to modulate a carrier.

CIRCUIT DIAGRAM



CIRCUIT EXPLANATION

The circuit consists of two Bipolar Junction Transistors (BJT) having voltage divider bias. The values of R1 and R2 of transistor Q1 are 6.8kΩ and 2.2kΩ respectively. Also the the collector resistance Rc and emitter resistance Re have values 2.2kΩ and 560Ω respectively. The coupling capacitor Cc1 has a value 4.2μF.

The transistor Q2 has a resistor of 1kΩ connected to its base. A resistor of 10kΩ is connected between the collectors of Q1 and Q2.

The circuit is given a **Vcc** supply of **12V** and output is taken from the collector of Q2.

A **modulating signal** of **300-500kHz(0-2Vp-p)** is given at the base of Q1. **Carrier signal** of **5-8kHz(0-5V)** is given at the base of Q2.

STEPS:

1) Initially connect 1kΩ directly to ground and check whether sinusoidal signal is obtained at output.

2) Give carrier signal.

3) Take output across Q2(it will be inverted).

ADVANTAGES AND DISADVANTAGES

Applications of PAM:

- It is used in Ethernet communication.
- It is used in many micro-controllers for generating the control signals.
- It is used in Photo-biology.
- It is used as an electronic driver for LED lighting.

Advantages:

- It is the simple process for both modulation and demodulation.
- Transmitter and receiver circuits are simple and easy to construct.
- PAM can generate other pulse modulation signals and can carry the message at the same time.

Disadvantages:

- Bandwidth should be large for transmission PAM modulation.
- Noise will be great.
- Pulse amplitude signal varies so power required for transmission will be more.

PRACTICAL OUTPUT