

B.Sc.24131 - Electronics Paper-I
(Power Amplifier, Oscillators and Power Supplies)

P. Pages : 2

Time : Three Hours



GUG/S/16/5602

Max. Marks :50

- Notes :
1. All questions are compulsory and carry equal marks.
 2. Draw labelled diagrams whenever necessary.
 3. Use of log table and calculator is allowed.

1. Either

- a) Differentiate between the voltage amplifier and power amplifier? 3+7
Explain the working of class A amplifier with resistive load and derive an expression for its efficiency.

OR

- b) Draw the circuit diagram of class B push pull power amplifier and Explain its working. 3+3
Show that efficiency of class B push pull amplifier is 78.5%. +4

2. Either

- a) State the difference between amplifier and oscillators. State the Barkhausen criterion for oscillators. Draw the circuit diagram of phase shift oscillator and explain its working. In phase shift oscillator $R_1 = R_2 = R_3 = 1M\Omega$ and $C_1 = C_2 = C_3 = 68pf$. At what frequency does the circuit oscillate. 3+1
4+2

OR

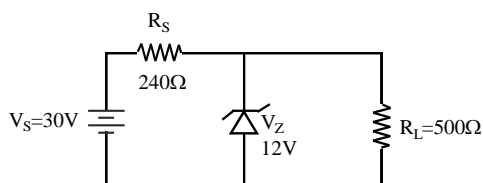
- b) Draw the circuit diagram of Wein bridge oscillator and explain its working. State its advantages and disadvantages. In the Wien bridge oscillator if $R_1 = R_2 = 120k\Omega$ and $C_1 = C_2 = 220pf$. Determine the frequency of oscillations. 5+3
+2

3. Either

- a) Define the voltage Regulation. A 10V. regulated d.c power supply has a regulation of 0.002%. Find the magnitude of variation in output voltage. 5+5
Draw the circuit diagram of Zener diode voltage regulator and explain its working.

OR

- b) With suitable diagram explain the working of transistor series voltage regulator. 5+5
Following figure shows the circuit of a Zener diode shunt regulator.



Find

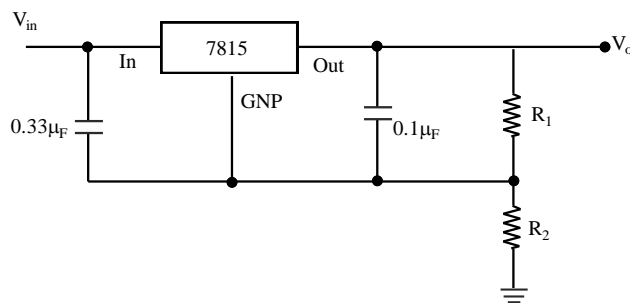
- a) The load voltage.
- b) Voltage drop across series resistance.
- c) Current through the Zener diode.

4. Either

- a) State the advantages of IC regulator. Draw the functional block diagram of IC LM. 317 and explain its working. Explain how LM 317 will be used as a adjustable voltage regulator. 3+5
+2

OR

- b) Draw the circuit diagram of a three terminal positive voltage regulator and explain its working. 5+5
Obtain 16v from a 15 v three terminal regulator. Use device type 7815. Given $I_Q=5.1\text{mA}$. Refer the following circuit.



- 5. a) Draw the circuit diagram of complimentary-symmetry power amplifier and state its advantages. 2½
- b) In Hartley oscillator calculate operating frequency if. 2½
 $L_1 = 1000\mu\text{H}$, $L_2 = 100\mu\text{H}$ and $M = 20\mu\text{H}$, $C = 20\text{PF}$.
- c) Explain the concept of short circuit protection. 2½
- d) Draw the circuit diagram of $\pm 15\text{V}$ dual power supply. 2½
