

1. A full wave rectifier supplies d.c. to a load of  $1k\Omega$ . If the a.c. voltage applied to the diode is  $200\sin 200t$  volts (rms), calculate: (a) Average d.c. voltage, (b) Average d.c. current, (c) Ripple voltage (rms), neglecting the diode resistance.
2. In full wave rectifier the load resistance is  $1k\Omega$ . The forward dynamic resistance of each diode is  $10\Omega$ . The voltage across half of secondary winding is  $220\sin 200t$ . Find the (a) Peak value of current. (b) Average dc value of current, (c) The rms value of current, (d) The rectification efficiency.
3. A transistor is connected in CE configuration. The collector supply voltage is 10 V and the voltage drop across the  $500\Omega$  resistor connected in the collector circuit is 0.6V. If  $\alpha = 0.96$ , find the (a) collector-emitter voltage, (b) base current and (c) the emitter current.
4. The constant  $\alpha$  of a transistor is 0.95. What would be the change in collector current corresponding to a change of 0.4 mA in the base current in a common-emitter arrangement?
5. A carrier wave of 500 watt is subjected to 100% amplitude modulation. Determine (a) power of modulated wave and (b) power in side bands.
6. A common source FET amplifier has a load resistance  $R_L = 500k\Omega$ . If the a.c. drain resistance ( $r_d$ ) and amplification factor ( $\mu$ ) of the FET are  $100k\Omega$  and 24, respectively. Calculate the voltage gain of amplifier.
7. For a constant drain-to-source voltage if the gate-source voltage is changed from 0 to -2V the corresponding change in drain current becomes 2mA. Calculate the transconductance of FET. If the a.c. drain resistance is  $100k\Omega$ , calculate the amplification factor of FET.
8. In a Hartley oscillator the tank coil has two sections of inductances 80 mH and 20 mH. The capacitor has a capacitance 500 pF. Neglecting the mutual inductance of coil find its frequency of oscillation.
9. In a Colpitt oscillator, the inductance and capacitance used in the tuned circuit are 50 mH and 100 pF and 400 pF. Calculate the frequency of oscillations.
10. An OPAMP has a slew rate of  $0.8\text{ v}/\mu\text{s}$ . What is the maximum amplitude of undistorted sine wave that OPAMP can produce at a frequency of 40 kHz?. What is the maximum frequency of sine wave that OPAMP can reproduce if the amplitude is 3 V?