**Q.P. Code : 731401**

(3 Hours) [Total Marks : 80

N.B. : (1) Question number one is **compulsory** and from the rest of the questions solve any **three**.

(2) Assume suitable data wherever required.

1. (a) Explain the criteria for substrate material selection in HMIC. 20
   (b) How the coupled line parameters varies with frequency ?
   (c) What is optimum termination for an Microwave Amplifier ?
   (d) Explain Dielectric resonator oscillator in detail.

2. (a) Determine the stability of GaAs FET that has the following S-parameters 10 at 2 GHz in son system both graphically and mathematically.
   $S_{11} = 0.86 \angle -57^0$, $S_{21} = 3 \angle 125^0$
   $S_{12} = 0.018 \angle 61.5^0$, $S_{22} = 0.775 \angle -26^0$
   (b) Derive an Expression for Transducer Power Gain of an Amplifier. 10

3. (a) Design one port oscillator using tunnel diode with $\tau_{in} = 1.25 \angle 40^0$ at 8 10 GHz in 50Ω system
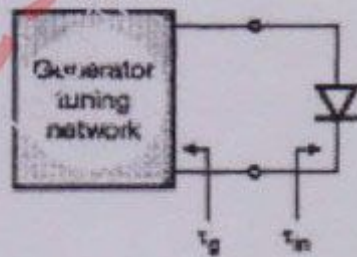
   (b) Explain Dielectric resonator oscillator in detail 10

4. (a) Explain two Coupled Line operated as four port microwave device. 5
   (b) What is Planar Waveguide. Describe its parameters. 10
   (c) Describe any fabrication process for the MMIC. 5

[TURN OVER

5. (a) Discuss Various Mixer Topologies and Compare their per forrnances. 10

   (b) What are the causes of low frequency noise and high frequency noise 5
   associated with the mixer ?

   (c) Explain Large signal characterization with reference to load pull 5
   countors, how it is measured?

6. Write short note 20
   (a) Compressed Smith Chart
   (b) Double Balanced Mixer
   (c) Micro strip Line for Millimetre wave
   (d) Amplifier Linearization Methods

————————————