

2nd Half-12 min: (d)-25

Con. 9123-12.

(REVISED COURSE)

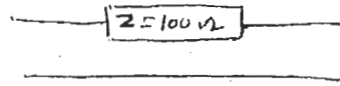
KR-4443

(3 Hours)

[Total Marks : 100

- N. B. :** (1) Question No. 1 is compulsory.
 (2) Attempt any four questions from the remaining six questions.
 (3) Use **Smith Chart** if necessary.
 (4) **Figures** to the right indicate full marks.

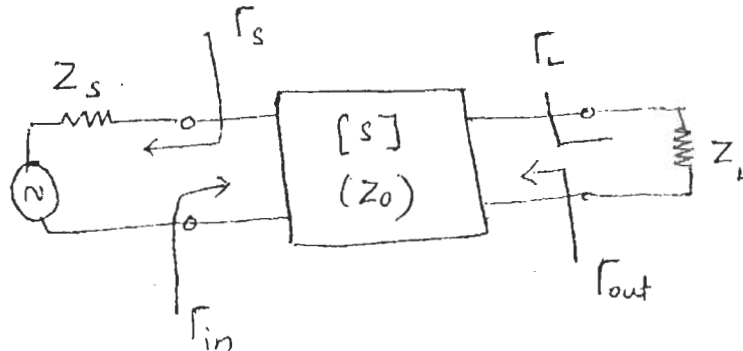
1. (a) Find S-parameters of two port series network $Z = 100 \Omega$ and $Z_0 = 75 \Omega$. 5



- (b) Draw and explain in short test setup to measure signal to noise ratio. 5
 (c) Explain 1 db compression. 5
 (d) Explain stability circles and its importance in amplifier design. 5
2. (a) Derive the transducer power gain as : 10

$$G_T = \frac{P_L}{P_{avg}} = \frac{|s_{21}|^2 (1 - |\Gamma_s|^2) (1 - |\Gamma_L|^2)}{|1 - \Gamma_s \Gamma_{in}|^2 |1 - s_{22} \Gamma_L|^2}$$

- (b) For the two-port network shown below find input reflection co-efficient (Γ_{in}) 10
 and output reflection co-efficient (Γ_{out}) using signal flow graph :



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3. (a) A BJT has the following S-parameters : 10

$$\begin{aligned} S_{11} &= 0.65 \angle -95^\circ & S_{21} &= 5.0 \angle 115^\circ \\ S_{12} &= 0.035 \angle 40^\circ & S_{22} &= 0.8 \angle -35^\circ \end{aligned}$$

Is this transistor unconditionally stable ? Draw input and output stability circles.

- (b) Determine stability of a GaAs FET that has the following S-parameter at 2GHz 10
in a 50Ω system both graphically and mathematically :

$$\begin{aligned} S_{11} &= 0.89 \angle -60^\circ & S_{21} &= 3.1 \angle 123^\circ \\ S_{12} &= 0.02 \angle 62^\circ & S_{22} &= 0.78 \angle -27^\circ \end{aligned}$$

4. Design a transistor oscillator at 4 GHz using FET in a common gate configuration. 20
An inductor of value 5 nH is placed in series with the gate to increase the instability.
Choose a terminating network to match a 50Ω load and an appropriate tuning network.
The S-parameters of the transistor are :

$$\begin{aligned} S_{11} &= 2.18 \angle -35^\circ & S_{21} &= 2.75 \angle 96^\circ \\ S_{12} &= 1.26 \angle 18^\circ & S_{22} &= 0.52 \angle 155^\circ \end{aligned}$$

5. A power amplifier uses a GaAs FET transistor that has the following large signal 20
S-parameters at 3 GHz in a 50Ω system :

$$\begin{aligned} \text{Given : } S_{11} &= 0.62 \angle 140^\circ & S_{12} &= 0.06 \angle -10^\circ \\ S_{21} &= 2.58 \angle 20^\circ & S_{22} &= 0.53 \angle -120^\circ \\ P_{\text{db}} &= 30 \text{ dbm.} \end{aligned}$$

Design a class A power amplifier for maximum output power. Assume ± 0.5 db error in gain is allowable in our design.

6. (a) Explain in detail single ended diode Mixer. What are mixer design considerations ? 10
(b) Explain broad band microwave amplifier using balance amplifier design techniques. 10

7. Write short notes on any **two** :— 20

- (a) Characteristics of Power Amplifier
- (b) Microwave Resonators
- (c) Balanced FET Mixers.

30/11/2012
2nd Half-12 mna-(d)-31
Con. 9147-12.

B.E (EXTC) Sem VIII (R)
Optical Fiber Communication
(REVISED COURSE) KR-4695

(3 Hours)

[Total Marks : 100

- N. B. : (1) Question No. 1 is compulsory.
(2) Attempt any four questions out of remaining six questions.
(3) Figures to the right indicate full marks.

1. (a) What are the advantages of optical fiber Communication ? 20
(b) Explain Bandwidth distance product.
(c) What are Linearly Polarized modes ?
(d) Compare direct band and indirect band semi conductors.
2. (a) Derive the expression for numerical aperture of a step-index fiber. What will happen to N. A. if Cladding is removed ? 10
(b) Compare step index and graded index fiber. 10
3. (a) Starting from Maxwell's equation, derive the wave equation for step index fiber. 10
(b) Explain the significance of V-number. Derive the expression for number of guided modes in graded index fiber. 10
4. (a) What do you understand by intramodal dispersion ? Derive the expression for material dispersion. 10
(b) What are the reasons for signal attenuation in an optical fiber ? 10
5. (a) Give the structure of a surface emitting LED. Compare with an edge emitting LED. 10
(b) Explain Avalanche Photodiode with proper structure and electric field. What is multiplication factor ? 10
6. (a) What are splices ? Explain different types of splices. 10
(b) Explain Double Crucible method of fiber fabrication. 10
7. Write short notes on any two :— 20
(a) Linearly Polarized modes
(b) OTDR
(c) Link Power Budget.

05/12/12

wireless network

VIII / EXTC / R1

19 : 2nd half 12-shilpa(e)

Con. 10020-12.

(REVISED COURSE)

KR-5094

(3 Hours)

[Total Marks : 100

N.B. : (1) Question No. 1 is **compulsory**.

(2) Attempt any **four** questions from remaining question Nos. 2 to 7.

(3) Draw **neat** sketches wherever **necessary**.

(4) Assume **suitable** data if **required**.

1. (a) What is role of General Packet Radio Services (GPRS) in the GSM. 5
(b) Why is power control used in CDMA 2000 and WCDMA. 5
(c) Explain the security aspect of Bluetooth. 5
(d) Write various uses of Wireless Sensor Network. 5
 2. (a) Explain UMTS network reference architecture in detail. 10
(b) Discuss QoS attributes used in UMTS. 10
 3. (a) Discuss the forward and reverse link channels in CDMA 2000. 10
(b) Explain evolution of IS-95 in detail. 10
 4. (a) Explain Link budget analysis and requirements of wireless network. 10
(b) Draw and explain WAP programming model in detail. 10
 5. (a) Define and explain different terms used in Bluetooth. 10
(b) Explain wireless sensor network protocol stack in detail. 10
 6. (a) Compare all versions of IEEE 802.11 WLAN. 10
(b) Give the advantages, disadvantages and applications of WAP. 10
 7. (a) Compare CDMA 2000 and WCDMA. 10
(b) Write a short note on RFID. 10
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B-E VIII Re. ~~Extc~~ Extc II |
Elective II Sat. comm.

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Con. 10272-12.

(REVISED COURSE)

KR-5292

(3 Hours)

[Total Marks : 100

- N.B.:** (1) Question No. 1 is **compulsory**.
(2) Attempt **any four** questions out of **six** questions.
(3) Assume **suitable** data whenever **required**.
(4) **Figures to the right** indicate **full marks**.

1. Attempt the following :--- 20
- (a) Define :— (i) True anomaly and mean anomaly
(ii) Satellite velocity and Satellite period.
- (b) Compare :— (i) FH – CDMA and DS – CDMA
(ii) Launching of satellite
(I) Geo-satellite
(II) Synchronous satellite.
2. (a) Draw block diagram of Transmit Receive type earth station, explain each block in details. 10
- (b) What are the methods of digital modulation tech and which one is mostly used in digital satellite communication 10
3. (a) Derive uplink equation w.r.to saturation flux density, input backoff earth station HPA and uplink rain fade margin. 10
- (b) What is TDMA super frame, explain its structure? How it is different from a simple TDMA frame differentiate between centralised control system and distributed control system of DA FDMA. 10
4. (a) What do you mean by system noise temperature? How does it affect the $\left(\frac{C}{N}\right)$ ratio and $\left(\frac{G}{T}\right)$ ratio n. Calculate $\left(\frac{C}{N}\right)$ ratio in dBHz. Given that $B = 36$ MHz, calculate $\left(\frac{C}{N}\right)$ ratio in dBs. 10
- (b) Describe the symmetrical offset and Cassegrain mounting of parabolic reflector find gain of 01 meter diameter dish-antenna at 06 GHz, with 60% efficiency. 10

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5. (a) Explain significance of equation $U = \frac{1}{2} mv^2 - \frac{6mm}{2}$ in launching of geo stationary satellite. **10**
- (b) Why do some satellite have two (2) transponders, which other have twentyfour (24) ? **10**
Explain simplified block diagram of satellite transponder :
(i) single conversion in "c" band
(ii) double conversion in "ku" band.
6. (a) How I-M noise is generated in satellite system ? How it can be reduced ? Give the details of third order intermodulation. **10**
- (b) What is meant by polarization of satellite, explain Ionospheric and rain depolarization. **10**
7. Short note on :— **20**
- (a) 3 - axis stabilisation
 - (b) SPADE system
 - (c) Electrical power system
 - (d) Tracking Tech used in Geostationary Satellite.
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