Seat No. : _____

AJ-105

April-2015

M.Sc., Sem.-IV

ELE-510 : Electronics Science

Electronic Communication-II

Time : 3 Hours] **[Max. Marks : 70**

Instructions : (1) Attempt **all** questions.
(2) **All** questions carry equal marks.
(3) Symbols and terminology have their usual meanings.
(4) Scientific calculator may be permitted.

1. (a) What is the role of sample & hold circuit in data acquisition ? Draw the circuit and explain its operation. **7**

OR

Give diagrams of USB cables & connectors. Compare features of USB & IEEE 1394.

(b) Write a note on different Data Acquisition Systems. **7**

OR

Give pin diagram of MAX RS-232. Give advantages and disadvantages of RS-232 interface.

2. (a) Discuss GPIB handshake protocol with timing diagrams. **7**

OR

Explain how expanders are used in GPIB interfacing.

(b) Give block diagram of SCPI system. Give examples of commands used to measure voltage & current by the system. **7**

OR

Give features of IEEE 488. Give examples to perform simple operations like initializing instrument, triggering instrument, reading measurement from instrument on the bus.

3. (a) Derive the RADAR range equation and explain each terms. Discuss different possibilities of increasing range of the radar and mention their limitations. **7**

OR

Explain different tracking techniques used in radars.

(b) Discuss various factors to be considered while choosing frequency for satellite communication. What are the different frequencies commonly used for satellite communication ? Mention their advantages and disadvantages of each. With help of a sketch, explain what is meant by polarization discrimination. **7**

OR

Discuss Time Division Multiple Accessing (TDMA) technique employed in satellite communication. Compare merits and demerits of TDMA or FDMA.

4. (a) (i) Explain advantages and disadvantages geostationary orbit for satellite communication. **3**

(ii) Discuss interferences produced within a cellular telephone system. **4**

OR

(i) Calculate the maximum range of a radar system which operates at 3 cm with a peak pulse power of 500 kW, if its minimum receivable power is 10^{-13} W, capture area of the antenna is 6 m^2 and RCS area of target is 25 m^2. **3**

(ii) In connection with mobile communication, explain cell splitting and cell sectoring. **4**

(b) Discuss the basic concept of cellular telephone. With help of a sketch, describe the concept of cellular frequency reuse. What is meant by frequency reuse factor ? **7**

OR

Describe in detail roaming and handoff. Distinguish between hard handoff and soft handoff. Explain basic steps in handoff process.

5. Answer **all** following questions : **14**

(i) Why is isolation required in data acquisition ?

(ii) What is total length of cable allowed in GPIB ?

(iii) Analog input to ADC is 0 to 1000 mV. If output is 9 bit digital then find the approximate resolution.

(iv) Which ADC is slowest ?

(v) Give logic levels of GPIB interface.

(vi) Name one serial & one parallel interface.

(vii) Give input & output profile of RS-232.

(viii) Which type of radar is used for determining velocity of an object ?

(ix) What is meant by blind speed in connection with radar ?

(x) In satellite communication, why higher frequencies are used for uplinking compared to downlinking ?

(xi) Inclination of Indian Communication satellite INSAT is _____

(xii) Why is it essential to have storage batteries in satellites ?

(xiii) Expand : (a) GPRS (b) GSM

(xiv) Why cells have honey comb shape ?