Roll No.										

Paper Code: EC-021

B.TECH
(SEM VII) ODD SEMESTER EXAMINATION 2016-17
SATELLITE COMMUNICATION

[Time: 3 Hours] **[Max. Marks: 100]**

Note: *Attempt all questions.*

Q.1. Attempt any **FOUR** parts of the following:- **(5x4=20)**

(a) Discuss in brief the elements of Satellite Communication.
(b) Define Look angle. Derive the equations for its calculation.
(c) The semi major and semi minor axes of an elliptical satellite orbit are 20000 km and 1600 km respectively. Determine the apogee and perigee distance.
(d) Define geostationary orbit. How the satellite is placed in geostationary orbit.
(e) Discuss the factors that affect the uplink and downlink design.
(f) What is the optimum G/T ratio for a standard earth station?

Q.2. Attempt any **TWO** parts of the following. **(10x2=20)**

(a) Derive general link equation. Show that G/T ratio is directly proportional to C/N ratio. Discuss the importance of those relations in satellite link design.
(b) What is attitude and orbit control system? Explain. Also discuss its applications.
(c) Explain satellite subsystems. Also describe the antenna requirement for large and small earth stations.

Q.3. Attempt any **TWO** parts of the following. **(10x2=20)**

(a) Describe in detail the effects of rain, cloud and ice on propagation in satellite communication. How those effects vary with frequency bands used.
(b) Explain the satellite communication system architecture using VSAT with the help of suitable diagram. Also discuss the applications of VSAT.
(c) Write a short note on non-geostationary orbit and its application.

Q.4. Attempt any **TWO** parts of the following. **(10x2=20)**

(a) What do you mean by global positioning systems? Discuss the position location principle of GPS. Also draw the block diagram of a GPS receiver and explain its working.
(b) With the help of suitable diagram describe the working of home receiver in direct broadcast satellite television.
(c) Explain the GPS Navigation Message and timing accuracy.

Q.5. Attempt any **TWO** parts of the following. **(10x2=20)**

(a) Describe in brief different types of antennas used in satellite communication.
(b) Discuss the technical characteristics and classification of mobile system antenna.
(c) Write a short note on antenna systems for mobile satellite broadcasting.