Kafrelsheikh University - Faculty of Engineering			
Course	Satellite Communications	Date	4 /3/2021
Time	3 Hours	Mark	90
Students	4th Year Electronics and Electrical Communications		

This exam measures competences no.: A.1, A.2, B. 2. B.3, C.3.

Answer all the following questions:

Clarify your answer with the suitable diagrams.

Q1.a Find the relation between the frequency of the rotation and the radius of the satellite orbit. (10 Marks)

Q1.b State the three Laws of Kipler for Satellite Communications. (5 Marks)

Q.2.a Draw and Explain How the TWT Amplifier works. (10 Marks)

Q.2.b What is a Regenerative Repeater? How is it different from Transparent Repeater? (5 Marks)

Q.3.a Compare between the following orbits (10 Marks)

a- Geostationary orbits (GEO). b- Low Earth orbit (LEO).

Q.3.b Explain How to protect the satellite from : (5 Marks)

a) Small Debris less than 1 CM. b) Large Debris

Q.4.a Explain with Drawings the following: (10 Marks)

a- the Cassegrain Antennas. b- Gregorian Antennas.

Q4.b Calculate time in days, hours, minutes and seconds for epoch day 224.9561. (5 Marks)

Q5.a Derive an equation for the attenuation caused by rain. (10 Marks)

Q5.b Calculate the average length of the civil year in Gregorian calendar. (5 Marks)

Q.6.a Discuss the TT&C system of a communication satellite. (10 Marks)

Q.6.b Elaborate on the bus system of the communication satellites. (5 Marks)