

University of Mumbai
Examinations Summer 2022

Time: 2 hour 30 minutes

Max. Marks: 80

Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	Kepler's second law is known as
Option A:	The Law of Orbits
Option B:	The Law of Areas
Option C:	The Law of Periods
Option D:	The Law of Gravity
2.	The quality of space link is measured in terms of _____ ratio.
Option A:	C/N
Option B:	S/N
Option C:	G/T
Option D:	EIRP
3.	What is meant by EIRP?
Option A:	Equivalent Isotropic Radiated Power
Option B:	Energy Isotropic Radiated Power
Option C:	Equivalent Isotropic Resonance Power
Option D:	Equivalent Intermodulated Radiated Power
4.	The distance of a Geo synchronous satellite from Earth's surface is _____ km.
Option A:	300
Option B:	10000
Option C:	35900
Option D:	5
5.	The satellite subsystem that monitors and controls the satellite is the
Option A:	propulsion subsystem
Option B:	power subsystem
Option C:	communications subsystem
Option D:	telemetry, tracking, and command subsystem
6.	At the beginning of each burst, certain time slots are used to carry timing & synchronization information, these time slots are collectively known as _____
Option A:	Preamble
Option B:	Guard time
Option C:	Frame efficiency
Option D:	Decoding quenching
7.	The point where the orbit crosses the equatorial plane going from north to south is called _____.
Option A:	Ascending node
Option B:	Descending node
Option C:	Line of nodes
Option D:	Line of apsides
8.	To make antenna more directional, either its size must be increased or
Option A:	the number of its feed horns must be increased
Option B:	the frequency of its transmission must be increased

Option C:	its effective isotropic radiated power (EIRP) must be increased
Option D:	its footprint must be increased
9.	DAMA stands for
Option A:	Data accessibility master aerial
Option B:	Digital attenuators microwave antenna
Option C:	Dual accessibility mode antenna
Option D:	Demand assigned multiple access
10.	The direct equivalence between noise factor and noise temperature:
Option A:	$T_e = (F + 1) T_0$
Option B:	$T_e = (F - 10) T_0$
Option C:	$T_e = (F - 1) T_0$
Option D:	$T_e = (F - 1) / T_0$

Please use either of the 3 option given below while setting up the subjective/descriptive questions

Q2	Solve any Four out of Six	5 marks each
A	Explain different orbital parameters.	
B	Define and explain reliability in satellite.	
C	Explain design considerations of Earth Station.	
D	What is EIRP and [G/T] ratio. For a satellite circuit the carrier-to-noise ratios are uplink 23dB, downlink 20dB, intermodulation 24 dB. Calculate the overall carrier- to-noise ratio in decibels.	
E	Compare: TDMA & FDMA.	
F	Explain GPS.	

Q3	Solve any Two Questions out of Three	10 marks each
A	Explain SPADE system.	
B	Derive satellite link budget equation.	
C	Explain VSAT.	

Q4	
A	Solve any Two 5 marks each
i.	State and explain Kepler's laws with the help of diagram.
ii.	Explain input back off and output back off.
iii.	Explain Laser satellite system.
B	Solve any One 10 mark each
i.	Explain TT&C system with the help of block diagram.
ii.	With the help of block diagram explain transmit receive type of earth station.