Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

SECOND SEMESTER M.TECH. (AEROSPACE ENGINEERING)

END SEMESTER EXAMINATION APRIL /MAY 2017

SUBJECT: SPACE ENVIRONMENT AND SYSTEM DEGRADATION IN SPACE [ICE 5240]

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL** the questions.
- Missing data may be suitably assumed.

1A.	Explain with the help of a table five families of spacecraft orbits.	**3**
1B.	Sketch and explain the earth magnetosphere showing the magnetopause, magneto tail, neutral point, radiation belt and ring current.	**5**
1C.	Write a short note on planetary atmosphere.	**2**
2A.	Describe the meteoroid environment effects in space.	**4**
2B.	With the help of diagram, explain NMOS transistor with trapped charges.	**4**
2C.	Write an equation of aerodynamic force on a satellite system.	**2**
3A.	Define photon radiation and discuss different types of radiation in space.	**3**
3B.	Explain the MSISE-90 mean atomic oxygen density as a function of solar activity.	**4**
3C.	Determine the scale height of the earth's atmosphere at the surface of the earth, given M=29 kg $kmol^{-1}$, T=298.15 K (25^0C), g=9.80665 ms^{-2} and R = 8314.472 J $kmol^{-1}K^{-1}$.	**3**
4A.	Sketch the floating grounding option for solar array to the spacecraft.	**5**
4B.	Explain in detail the daytime ionospheric layers.	**4**
4C.	Write any two major components of F2 region.	**1**
5A.	Explain in detail the capture and removal of active debris.	**4**
5B.	Write any four factors taken into account in selecting a thermal coating in spacecraft.	**2**
5C.	Define solar environment and list its various effects on spacecraft subsystem.	**4**