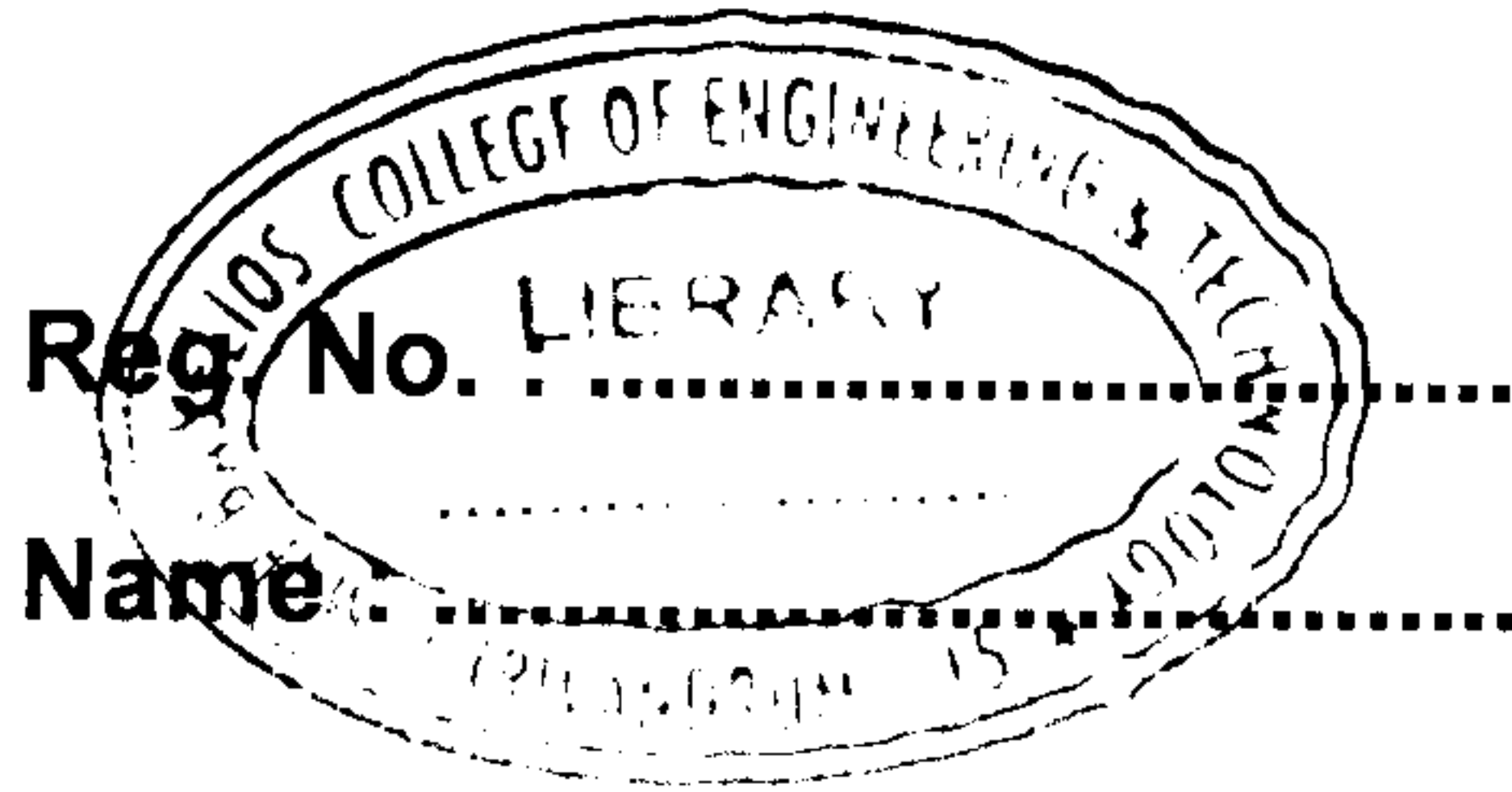


(Pages : 3)

H – 3385



Eighth Semester B.Tech. Degree Examination, November 2019

08.804 : SATELLITE AND MOBILE COMMUNICATION (T)

(2008 Scheme)

Time : 3 Hours

Max. Marks : 100

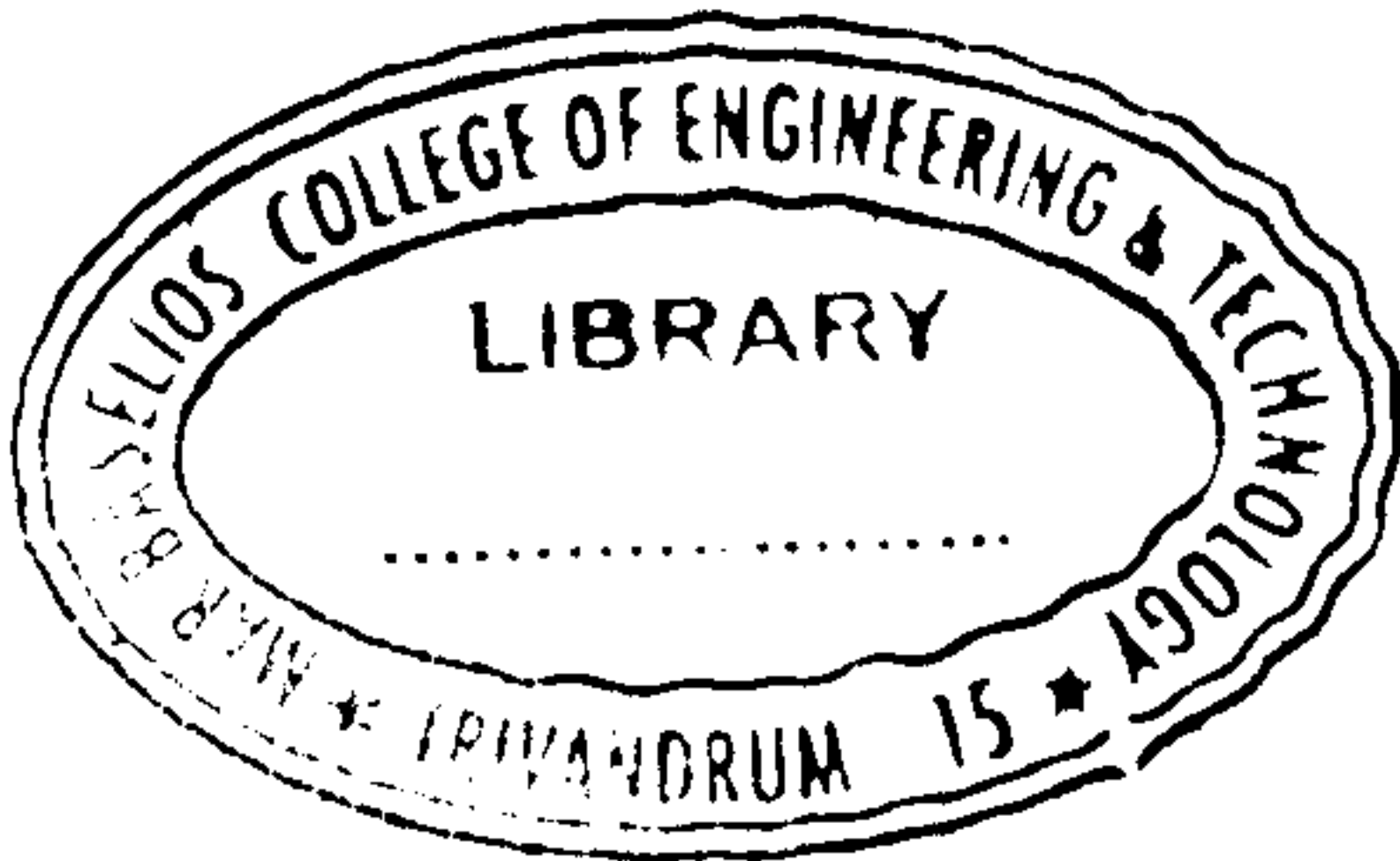
PART – A

Answer **all** questions. **Each** question carries **4** mark.

1. What is the difference between geostationary and low earth orbiting satellite? Can a low earth orbiting satellite be used for communication purpose? Give reasons.
2. State Kepler's laws of planetary motion.
3. A satellite is rotating at a distance of 20,000 km from a point on the earth surface. If the operating frequency of satellite is 4Gz and receiving antenna gain is 61.4 dB. Determine the power received given that EIRP = 26.02 dB.
4. What is meant by station keeping of satellite? Explain its significance and also methods to achieve it.
5. Illustrate a coverage area consisting of three cellular clusters, each cluster contain 7cells explain the advantages of frequency reuse.
6. Differentiate soft handoff and hard handoff.
7. State the factors affecting small scale fading? What do you mean by fading?
8. State four advantages of direct sequence modulation.

P.T.O.





9. What is meant by near for problem in CDMA? State a method to overcome it.
10. Define (a) voice activation (b) cell sectorisation. How does the sectorisation improve the capacity (can 1 when 60° sectory is used (c) 120° sectoring is used).

(10 × 4 = 40 Marks)

PART – B

Answer any **two** questions from each Module. Each question carries **10** marks.

Module – I

11. List various satellite subsystems (atleast 6). Briefly explain subsystems and state their important functions.
12. Derive the C/N at the earth station and at the satellite.

The following parameters apply to a satellite down link :

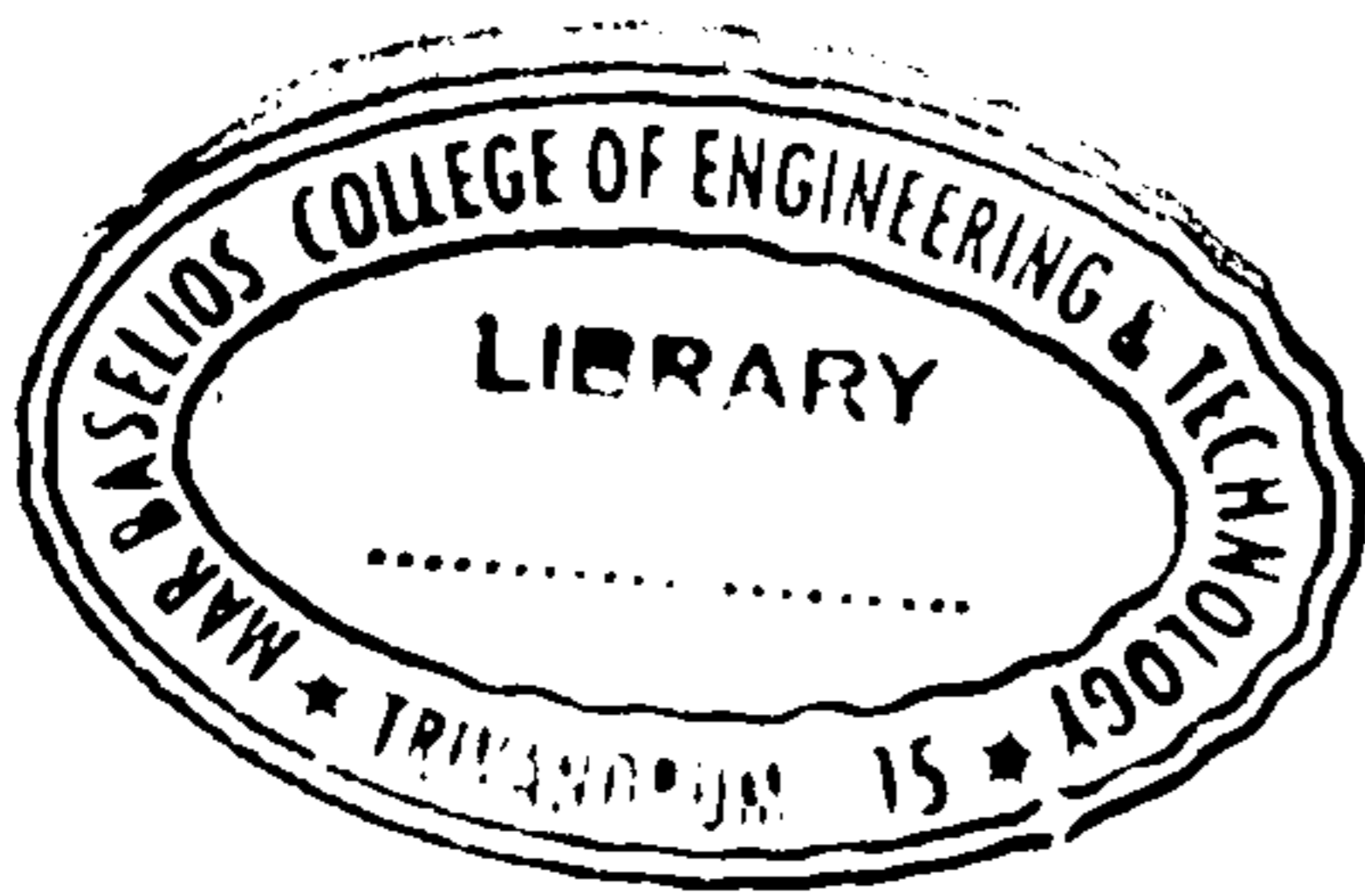
EIRP = 22.5 dBW, Free space losses = 195dB, other losses = 1.5 dB. Earth station $G/T = 37.5$ dB/k. Calculate C/N at earth. Assuming an output backoff of GdB, what is the new value of (C/N)?

13. (a) Discuss the various types of antenna used (i) space craft (ii) earth station.
- (b) Calculate the gain of a 3 m parabolical antenna operating at a frequency of 12GHz. Assume aperture efficiency of 0.5.

Module – II

14. (a) Explain the Okamura's propagation model.
- (b) Find the median path loss using Okamura model for $d = 5$ km, $h_{te} = 100$ m, $h_{re} = 10$ m. If base station transmitter EIRP = 1kw at carrier frequency of 900 MHz. Find the received power let receiving antenna gain in unity. Given median attenuation relative to free space = 9dB. Gain due to type of environment – 9dB.





15. Explain in detail the four techniques used for improving the coverage and capacity in cellular system.
16. Explain the various multiple access technique stating advantages and disadvantages of each.

Module – III

17. What is the average number of users allowed per cell in a CDMA system if the following datas are given:

Other interference / metre = 0.55

SINR at the receiver = 8 dB

Total spread factors = 125

No/lo = 0.25

If the cell uses a directional antenna over a sector of 60°. What will be the new number of users.

18. State and explain any three spreading codes and their advantages. What should be the ideal – cross correlation between the spreading codes.
19. (a) How does a MIMO system provides high spectral efficiency in a Rayleigh scattering environment?
(b) Briefly describe smart antenna.

(6 × 10 = 60 Marks)

