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| **ST. JOSEPH’S COLLEGE (AUTONOMOUS), BANGALORE-27** | | | | | | |
| **B. Sc. - VI SEMESTER** | | | | | | |
| **SEMESTER EXAMINATION: APRIL 2018** | | | | | | |
| **EL 6115 – COMMUNICATION ELECTRONICS** | | | | | | |
|  |  |  |  |  |  |  |
| **Time- 2 1/2 hrs** | |  | **Max Marks-70** | | |  |
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**This paper contains TWO printed pages and THREE parts**

**PART- A**

Answer any **FIVE** of the following 5 × 8= 40

1 a) Explain the types of Amplitude Modulation.

b) Derive the expression for the instantaneous voltage of AM. (2+6)

2 a) Explain the block diagram of FM Transmitter.

b) Explain the four predominant methods of Digital communication with waveforms. (4+4)

3 a) Give the brief explanation of the equivalent circuit of an Antenna .

b) Give the block diagram of Pulsed RADAR and explain. (2+6)

4 a) What is multiplexing? Explain how TDMA is employed in Satellite communication.

b) Explain the components of earth station. (5+3)

5 a) Explain the block diagram of C- band Satellite transponder.

b) Explain the block diagram of OFC system. (4+4)

6 a) Explain the working of a PIN photo diode.

b) Give the block diagram of cellular communication. (4+4)

7 a) Give the differences between serial and parallel data transmission.

b) Explain the Architecture of Networking. (4+4)

**PART- B**

Answer any **FIVE** of the following 5×4= 20

8 A 100 Mhz carrier is frequency modulated a sinusoidal signal of 10 khz so that the

maximum frequency deviation is 1 Mhz. Determine the approximate bandwidth required

and the bandwidth of the FM carrier if (a) modulated signal amplitude is doubled. (b) the

frequency of the modulating signal is halved.

9 At the input to the receiver of a standard telephone channel frequency range is 300 Hz to

3400 Hz, the noise power is 60 µw and the signal power is 24 mw. Calculate the Shannon

limit for the channel capacity, and also when the signal power is halved.

10 A horizontal wire antenna of length 5 m is used to radiate at 20 Mhz. Calculate the

radiation resistance and the efficiency of the antenna if the loss resistance of the antenna

is 10Ω

11 Calculate the maximum range of a RADAR system which operates at 4 cm and a peak

value of pulse power at 750 kW, if its minimum receivable power is 10-13 W, the capture

area of its antenna is 5 m2 and RADAR cross-sectional area of the target is 15 m2.

12 In a Satellite communication system, calculate the path losses for:

(i) Signal of frequency 4 GHz at a distance of 36000 km.

(ii)Signal of frequency 10 GHz at a distance of 40000 km.

13 An optical fiber has core made of glass with a refractive index 1.525 and acceptance

angle of 12.32°.Calculate the refractive index of the clad material when

(i) Launching takes place from air. (ii) Launching takes place from a medium of refractive

index 1.45.

14 The frequencies of light produced by the three semiconductor diodes are 459 THz,

290 THz and 241 THz respectively. Calculate the wavelength and energy gap of the

materials used for the three diodes.

**PART- C**

Answer any **FIVE** of the following 5 × 2= 10

15 Mention the factors which control the amount of frequency deviation and rate of

frequency deviation.

16 Explain quantization error in digital communication

17 What are secondary antennas? Give example.

18 Name the high altitude earth orbit Satellite and mark the frequency spectrum range.

19 What is a photophone? Explain.

20 Mention the two major kinds of interferences produced within cellular telephone system.

21 Give two disadvantages of networking.

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