**DATE: 24-06-2019**



|  |
| --- |
| **ST. JOSEPH’S COLLEGE (AUTONOMOUS), BANGALORE-27**  **B. Sc. ELECTRONICS- VI SEMESTER**  **SPECIAL SUPPLIMENTARY SEMESTER EXAMINATION: JUNE 2019**  **EL 6115 – Communication Electronics**  Supplementary candidates only.  **Time- 2 1/2 hrs Max Marks-70**  **This paper contains TWO printed pages and THREE parts** |

**PART – A**

**Answer any Five questions:**   **5X8=40**

1(a) Describe sky wave propagation. What are the advantages and disadvantages?

(b) Explain the working of AM collector modulator. 4+4

2(a) With the necessary block diagram explain the working of FM transmitter.

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

3(a) Derive an equation for radiation resistance of an antenna.

(b) Explain the working of CW Doppler RADAR, with the help of a block diagram. 5+3

.

4(a) Explain different Satellite orbits with appropriate diagram. Give two advantages of

geostationary orbit.

(b) What is multiple access system in satellite communication? Explain how TDMA is

employed in satellite communication. 4+4

5(a) What is multiple access system in satellite communication? Explain how TDMA is

employed in satellite communication.

(b) Explain the principle of light transmission through fibre. Derive an expression for

acceptance angle and numerical aperture. 4+4

6 (a)Briefly explain the construction and working of Avalanche photodiode.

(b) Give the difference between GSM and CDMA phone. 4+4

7(a) Explain mobile communication with the help of a block diagram.

(b) With the Schematic diagram explain serial and parallel data transmission. 4+4

**PART – B**

**Answer any Five questions:**  **5X4=20**

8. An electromagnetic wave with a critical frequency 7 MHz transmitted from a point A,

with an angle of 136 degrees between incident and reflected ray, at a height of 300 Km

in space from the surface of the earth, which is received by a single hop transmission at

a point B. Determine the distance between A and B and also the MUF.

9. At the input to the receiver of a standard telephone channel frequency is ranging from

300 Hz to 3400zHz

Hz, the noise power is 60μw and the signal power is 24 mW. Calculate

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

10. An elementary doublet is 10cm long. If the frequency is 10 MHz and the current

flowing through it is 2A what is the field strength 20 km away from the doublet, in a

direction of maximum radiation?

11. Calculate the maximum range of a radar system which operates at 3 cm with a peak

pulse of 500kw, if its minimum receivable power is 10-13 W, the capture area of its

antenna is 5m2, and the cross sectional area of the target is 20m2.

12. Calculate the total transmission loss for a geostationary Satellite with an uplink

frequency of 6 GHz and down link frequency of 4 GHz, (Distance D = 36,000 km).

13. Calculate the numerical aperture of a step index fibre having n1 = 1.48 and n2 = 1.45.

What is the maximum acceptance angle for this fibre if the outer medium is air?

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 questions:**  **5X2=10**

15. Give two characteristics of data transmission.

16. What are resonant and non resonant antennas? Give examples for each of them.

17. What are high altitude earth orbit satellites? What is the operating frequency of these

orbits?

18. What is GPS with respect to satellite communication? What are the two levels of

service by GPS?

19. What are the requirements of light source?

20. Name two high speed connectors.

21. What is TCP/IP?

--------------------------