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BF—97—2016

FACULTY OF SCIENCE

B.Sc. (Third Year) (Sixth Semester) EXAMINATION

OCTOBER/NOVEMBER, 2016

(Old Course)

PHYSICS

Paper XV (Phy-305)

(Digital and Communication Electronics)

(Monday, 24-10-2016) **Time : 10.00 a.m. to 12.00 noon**

Time—2 *Hours* *Maximum Marks*—40

N.B. :— (*i*) Attempt *All* questions.

(*ii*) *All* questions carry equal marks.

1 Attempt any *four* : 8

(*a*) Draw the circuit diagram of Ex-OR gate using basic gates.

(*b*) What weight does the digit 4 have in the following decimal numbers ?

(*i*) 1426

(*ii*) 4020

(*c*) Define frequency modulation.

(*d*) What is the function of RF amplifiers in TRF radio receiver ?

(*e*) Convert the following gray code into binary numbers :

(*i*) 101110

(*ii*) 10110110

(*f*) Define modulation index for FM. How is it different from that of AM ?

(*g*) What do you mean by relay and processing satellite ?

2. Attempt any *two* : 8

(*a*) Find the minterms for 7 = A + BC

(*b*) State and explain DeMorgan's theorem.

(*c*) Derive an expression for amplitude modulated voltage and draw the necessary waveform.

P.T.O.

3. Attempt any *two* : 8

(*a*) Define demodulation. Draw the circuit diagram of linear diode detector and explain its working.

(*b*) With neat diagrams describe :

(*i*) Ground - user relay

(*ii*) Ground-crosslink ground

(*c*) Draw the block diagram of TRF radio receiver and explain function of each block.

4. Attempt any *one* : 8

(*a*) Derive the power relation for :

(*i*) Carrier power

(*ii*) Power in sidebands

(*iii*) Total power

(*iv*) Transmission efficiency of an amplitude modulated wave.

(*b*) Define modulation index and deviation ratio for FM. Obtain an expression for FM wave.

5. Write short notes on any *two* : 8

(*a*) Superheterodyne radio receiver

(*b*) Satellite frequency bands

(*c*) Frequency spectrum of AM

(*d*) Universal properties of NOR gate.