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B—208—2019

FACULTY OF SCIENCE

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

MARCH/APRIL, 2019

(CBCS Pattern)

ELECTRONICS

Paper XIV

(Communication Electronics-II)

(Wednesday, 10-4-2019)

Time : 10.00 a.m. to 12.00 noon

Time—2 Hours

Maximum Marks—40

- N.B. —** (i) All questions are compulsory.
(ii) All questions carry equal marks.
(iii) Use of non-programmable calculator and log table is allowed.

1. Attempt any four of the following : 8

- (a) An optical fibre of length 150 m has input power of $10 \mu\text{W}$ and output power of $9 \mu\text{W}$. Calculate the loss in dB/km.
- (b) Calculate the velocity and wavelength of light of frequency $f = 0.5 \times 10^{15}$ Hz. When travelling through glass having $n_1 = 1.5$.
- (c) What are the necessary conditions to be satisfied for achieving total internal reflection.
- (d) Define fidelity and sensitivity.
- (e) What is the image frequency of 1000 kHz signal if the intermediate frequency = 470 kHz ?
- (f) What is function of duplexer in radar.

2. Attempt any two of the following : 8

- (a) Describe about image frequency and its rejection in radio receivers.
- (b) Draw the block diagram of basic pulsed radar and explain its working.
- (c) Explain moving target indicator and doppler effect.

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3. Attempt any *one* of the following : 8
- (a) Derive radar range equation.
 - (b) Draw the block diagrams of :
 - (i) TRF radio receiver
 - (ii) Superheterodyne radio receiver and explain their working.
4. Attempt any *two* of the following : 8
- (a) Write a note on historical perspective of mobile communication system.
 - (b) Give the classification of optical fibres and explain with the help of neat diagrams.
 - (c) Describe the phenomenon of total internal reflection in optical fibres.
5. Attempt any *one* of the following : 8
- (a) Derive an expression for :
 - (i) Acceptance angle
 - (ii) Numerical aperture
 - (iii) Intermodal dispersionfor an optical fibre.
 - (b) Write notes on :
 - (i) Basic concepts of cellular system.
 - (ii) Third Generation (3G) system.