



US – 406

VI Semester B.Sc. Examination, May 2017
(CBCS) (Fresh) (2016 – 17 & Onwards)
ELECTRONICS – VII
Communication – II

Time : 3 Hours

Max. Marks : 70

Instruction : Answer **all** the questions from Part – A, **any five** from Part – B and **any four** from Part – C.

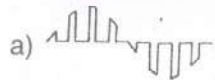
PART – A

Note : Answer **all** the questions of Part – A in **any one** page, answering the **same** question multiple times will **not** be considered for evaluation.

Answer **all** the subdivisions.

(15×1=15)

1. i) Pictorial representation of a typical PAM waveform is



ii) According to Nyquist rate,

- a) the signal should be sampled at least twice each cycle of its lowest frequency
- b) the signal should be sampled at least twice each cycle of its highest frequency
- c) guard time should be as large as possible
- d) guard time should be as small as possible

iii) Crosstalk occurs in a digital communication system due to

- a) impedance mismatch
- b) phase delay
- c) over modulation of various carriers in a multiplexed system
- d) simultaneous transmission of more signals

P.T.O.



- iv) Maximum unambiguous range of a RADAR is decided by
- a) nature of the target
 - b) pulse repetition frequency
 - c) transmitted power
 - d) capture area of the antenna
- v) When the peak transmitted power in a RADAR is increased by a factor of 16 the maximum range changes by a factor of
- a) 4
 - b) 8
 - c) 2
 - d) $\sqrt{2}$
- vi) With reference to the satellite orbit, 'perigee' is the
- a) farthest point in the orbit
 - b) nearest point in the orbit
 - c) point in the parking orbit
 - d) name of the boost motor that puts the satellite in the right parking slot
- vii) For Global communication, the minimum number of satellites needed in Geo stationery orbit, is
- a) 1
 - b) 3
 - c) 6
 - d) 4
- viii) In satellite systems, the entire bandwidth of the channel is used at all the time in
- a) FDMA
 - b) TDMA
 - c) CDMA
 - d) Both FDMA and CDMA
- ix) A step index fiber has
- a) Uniform distribution of refractive index
 - b) More value of refractive index at the centre and decreases towards the edges
 - c) More value of refractive index at the centre and decreases towards the edges in steps
 - d) Least value of refractive index at the centre and increases towards the edges
- x) In an optical fiber, light travels along the fiber due to
- a) refraction
 - b) scattering
 - c) total internal reflection
 - d) line of sight propagation
- xi) The need for cell splitting is
- a) Identification and authentication of the subscriber
 - b) Chatting and location based services
 - c) To meet the requirement of increased traffic
 - d) To overcome the power requirement



- xii) Frequency reuse in cellular communication refers to
 - a) allotting same frequency to many service providers
 - b) sharing the same frequency by different channels
 - c) using same frequency everyday
 - d) using the same frequency for both Uplink and Downlink
- xiii) IMEI number in a cell phone is the
 - a) Information of Mobile Equipment Identity
 - b) International Mobile Equipment Information Number
 - c) International Mobile Equipment Identity Number
 - d) Integrated Mobile Equipment Identity Number
- xiv) The data rate of 3G system is around
 - a) 2 Mbps b) 10 Mbps c) 20 Mbps d) 100 Mbps
- xv) Wi-MAX is the wireless technology for
 - a) Local Area Network b) Personal Area Network
 - c) Wide Area Network d) Metropolitan Area Network

PART – B

Answer **any five** questions.

(5×7=35)

- 2. a) Sketch the input and the output waveforms for ASK, FSK and PSK modulators.
b) Mention the difference between the bit rate and the baud in digital communication system. (5+2)
- 3. Explain with a neat block diagram the functioning of a pulsed RADAR system. (5+2)
- 4. a) What is clutter in a RADAR system ?
b) Draw the block diagram of a FM-CW RADAR and explain the function of each block. (1+6)
- 5. a) What are the different types of satellite orbits ?
b) Draw the block diagram showing the uplink model of satellite sub system and explain its function. (2+5)
- 6. a) Explain with a necessary diagram, the working of PIN photo diode.
b) Discuss the Rayleigh Scattering Loss in optical fibers. (5+2)



7. a) Write a note on the requirements of light sources in optical fiber communication system.
b) Discuss with a necessary diagram the working of a semiconductor LASER diode. (2+5)
8. Draw the OSI Model Layers for a networking system and explain the function of each layer.
9. a) Explain 'roaming' and 'hand-off' with respect to cellular mobile communication system.
b) Draw the block diagram of cellular phone handset. (4+3)

PART – C

Answer **any four** questions.

(4×5=20)

10. A radio channel has a bandwidth of 6 kHz and 30 dB S/N ratio. Calculate the maximum information carrying capacity. What happens to the information carrying capacity if the S/N ratio becomes 20 dB.
11. List the advantages and disadvantages of digital communication over analog communication.
12. Calculate the maximum range of a radar system which operates at 3 cm with a peak power of 500 kW, if its minimum receivable power is 10^{-13} W, the capture area of its antenna is 5 m^2 and the radar cross-sectional area of the target is 20 m^2 .
13. Calculate the path loss that occurs in a satellite system which operates with 4 GHz at a distance of
i) 20000 Kms and
ii) 36000 Kms.
14. Draw the block diagram of a satellite C band transponder and explain its operation.
15. A glass clad fiber is made with a core glass of refractive index 1.6. Cladding is doped to give a fractional difference of 0.005. Find the refractive index of cladding, critical internal angle of reflection and numerical aperture.
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