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**Et-401/CE-I/4th Sem/2017/N**

**COMMUNICATION ENGINEERING – I**

Full Marks – 70

Time – Three hours

The figures in the margin indicate full marks for the questions.

**PART – A**

Answer *all* the questions.

1. Fill in the blanks with suitable words : 10
  - (a) In A.M carrier component remains ———.
  - (b) F.M requires ——— bandwidth than A.M.
  - (c) A folded dipole has ——— bandwidth than a simple dipole.
  - (d) The current distribution in half wave dipole is ———.
  - (e) The characteristic impedance of a transmission line is the ——— impedance of the line terminated at ———.

[Turn over

- (f) F.M signal can be converted to A.M signal using \_\_\_\_\_.
- (g) Space wave propagation takes place within a frequency range of \_\_\_\_\_ to \_\_\_\_\_.
- (h) The ring modulator is generally used for generating \_\_\_\_\_.
- (i) V.S.B modulation occupies more \_\_\_\_\_ as compared to S.S.B modulation.
- (j) PPM signal is \_\_\_\_\_ of PWM.

2. Write True or False : 10

- (a) Reactance modulators are used to generate A.M signal.
- (b) In a plate modulation pentode is used as a plate modulator.
- (c) Wide band F.M can be generated by using Armstrong method.
- (d) The range of AM reception is less than FM.
- (e) The pulse modulation has an advantage that needs less bandwidth.
- (f) The dipole antennas are omnidirectional.

- (g) Reflection of radio waves occur more easily at lower frequencies than at higher frequencies.
- (h) The sky wave propagates in UHF band.
- (i) The absorption of radio waves by atmosphere depends on their frequency.
- (j) The characteristics impedance of a transmission line is directly proportional to its length.

3. Specify the correct answer : 5

- (a) Polarization of EM waves is due to
  - (i) Reflection
  - (ii) Transverse nature of EM waves
  - (iii) Longitudinal nature of EM waves
- (b) In Yagi antenna for connecting a coaxial cable to driven elements (folded dipole) we use
  - (i) Stub
  - (ii) Quarter wave transformer
  - (iii) Balun

- (c) In phase modulation the modulation index is proportional to
- (i) Signal strength
  - (ii) Carrier voltage
  - (iii) Modulating frequency
- (d) D-Layer in the ionosphere is largely present
- (i) All the 24 hours
  - (ii) During the night only
  - (iii) During the day only
- (e) FM broadcast band lies in the
- (i) LF
  - (ii) HF
  - (iii) VHF

### PART - B

Answer any *three* questions.

4. (a) What is modulation? Why do we need modulation? What are the different types of modulation? 3+4+3 =10
- (b) Explain with the help of block diagram Armstrong's system of generating FM wave. 5

5. Compare and contrast :  $5 \times 3 = 15$
- (a) Analog and digital signal.
  - (b) Line communication and radio communication.
  - (c) Resonant and non resonant antenna.
6. What do you mean by propagation of waves ?  
Explain ground waves, sky wave and space wave propagation in details.  $3 + 12 = 15$
7. (a) Draw with a dimensional sketch of a three element Yagi Uda antenna for reception of TV signal. 3
- (b) Explain how does antenna radiate electromagnetic energy. 6
  - (c) Define the terms :  
Antenna gain, Directive gain and Power gain of an antenna. 6
8. Write short notes on any *three* :  $5 \times 3 = 15$
- (a) VSB Transmission
  - (b) Impedance matching
  - (c) P.C.M
  - (d) Electromagnetic Spectrum.