WEST BENGAL STATE UNIVERSITY

B.Sc. General Part-III Examination, 2020

ELECTRONICS

PAPER-ELTG-IV-A

Time Allotted: 2 Hours | Full Marks: 50

The figures in the margin indicate full marks.
Candidates should answer in their own words and adhere to the word limit as practicable.
All symbols are of usual significance.

GROUP-A

1. Answer any ***ten*** questions from the following: 2×10 = 20

   (a) Define "modulation index" in AM system.

   (b) What do you mean by demodulation?

   (c) State any two advantages of FM over AM.

   (d) Define characteristic impedance of a transmission line.

   (e) What do you mean by lossless line?

   (f) What factors determine antenna gain?

   (g) What is the cut-off frequency of a waveguide?

   (h) Mention the function of $\overline{RD}$ and $\overline{WR}$ signal on a memory chip.

   (i) Write two different instruction by which we can clear accumulator.

   (j) What is the result of execution of the following instruction?
   (i) ADDM (ii) STA 8050H

   (k) What do you mean by over modulation, under modulation and 100% modulation in AM system?

   (l) What do you mean by radiation resistance of an antenna?

   (m) What is stack? On what principle does it work?

   (n) What is the need of ALE signal in 8085 μp?

GROUP-B

Answer any *two* questions from the following 5×2 = 10

2. Obtain an expression for the instantaneous voltage of an amplitude wave with single tone sinusoidal modulation. 5

3. Derive the expression for the input impedance of a transmission line of length L and having characteristic impedance 'Z_0'. 5

4. (a) Mention the different way in which a radio-wave can travel from transmitting antenna to receiving antenna. [2+(1+1+1)]

   (b) What are ground waves? Where are they used and what are their advantages?

5. Briefly discuss on the radiation mechanism of dipole antenna. 5

6. What is the result of execution of the following instruction? 5
MVIA, 35H; JNC2800H; LHI H, 2400H; PUSH B; STA 2070 H.

7. What do you mean by fetch cycle, execution cycle and instruction cycle? 5

GROUP-C

Answer any *two* questions from the following $10\times2 = 20$

8. (a) What are the characteristics of electromagnetic wave? What are the main methods of propagation of electromagnetic waves in radio communication? 2+3+5

(b) Explain the main features of sky-wave of electromagnetic waves.

9. (a) Define the following terms in connection with an antenna: 6+4

(i) Directivity (ii) Effective aperture (iii) Power density

(b) Calculate the modified gain in dB of a parabolic reflector when its size is made four times than it was.

10.(a) Show that an AM wave can be represented by a carrier and two side-frequency for each modulation frequency. 3+2+5

(b) Mention the technique of demodulation of AM move.

(c) Briefly explain the synchronous detection process.

11.(a) Write an 8085 assembly language program to add two 16-bit number. Results may contain "carry". 5+5

(b) Write an 8085 assembly language program to add two BCD numbers. Result should be in BCD format.

12.(a) Draw a net block diagram of 8085 microprocessor. 6+4

(b) Explain with an example—(i) Direct mode of addressing (ii) Register indirect mode of addressing.

13. Write a short note on: 5+5
(i) Automatic and Electronic exchanges.
(ii) Equivalent noise bandwidth and equivalent noise resistance.

14. What are the functions of the following: $2\frac{1}{2}\times4=10$

(i) Control and status signal

(ii) Serial I/O signals

(iii) DMA signals

(iv) Reset signals.

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