NEW

Part-III 3-Tier

2014

ELCTRONICS

PAPER—IVA & B

(General)

Full Marks : 65

Time : 3 Hours

The figures in the right-hand margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

Answer any *three* from Group–I, any *two from Group—II* and any *three* from Group—III.

Paper : IVA

(*Communication Electronics & Microwaves*)

Answer any *one* question from Group—A, and *two* questions each from Group—B & C respectively.

Group—A

Answer any *one* question.

1. (a) Define the critical frequency of an ionospheric layer. Show that the critical frequency f_c is related to the peak electron concentration N_p of the reflecting layer by $f_c = 9\sqrt{N_p}$ (in S.I. Units).

(b) An ionized layer exists at an altitude of 100 km above the surface of the earth. The electron concentration N (in m^{-3}) in the layer increases linearly with height h (in km), measured from the bottom of the layer following the relationship, $N = 5\times10^{10}+10^{9}h$. A radiowave frequency of 3 MHz is launched vertically upward from the surface of the earth. Find the height of the point above the ground from which the wave is reflected back? $9+3\frac{1}{2}$

2. (a) Derive an expression for the guide wavelength of TM mode propagation in hollow rectangular wave guide.

(b) A hollow rectangular wave guide has a = 6cm, b = 4 cm, f = 3GHz. Compute TE_{10} mode cut-off wave length. $8\frac{1}{2}+4$

Group—B

Answer any *two* questions.

3. What do you mean by characteristic distortion of a Telegraph system. Discuss the characteristic distortion of a Telegraph system. 2+6

4. (a) What is distortionless line?

(b) "A lossless line is also a distortionless line, but a distortionless line is not necessarily lossless." — Explain.

(c) An air line has characteristic impedance of 70Ω and plane constant of 3 rad/m at 100 MHz. Calculate the inductance per meter and the capacitance per meter of the lines. 2+2+4

5. (a) Define 'directive gain' and 'effective aperture' of an antenna. Write down the relation between them.

(b) A uniform plane wave is incident upon a very short lossless dipole ($\ell << \lambda$). Find the maximum effective area assuming that the radiation resistance of the dipole in $R_r = 80(\pi^t / \lambda)^2$ and the incident field is linearly polarized along the axis of the dipole. $(1\frac{1}{2}+1\frac{1}{2}+1)+4$

Group—C

Answer any *two* questions.

6. Show that the total Power for a fully amplitude modulated wave is 1.5 times the unmodulated carrier power. 4

7. Briefly describe about Power line Communication 4

8. What do you mean by Fading and Single-hop transmission. 2+2

Paper : IVB

(Microprocessors and their Applications)

Answer any *one* question each from every group.

Group—A

Answer any *one* question.

9. (a) Draw the functional block diagram of INTEL 8085 Microprocessors.

(b) Explain different types of flag register in 8085 Microprocessors. $7+4\frac{1}{2}$

10. (a) What do you mean by data and address bus.

(b) What are tri-state devices? Why are they used in a bus oriented system.

(c) What are the function of the following pins in 8085 microprocessors — (i) TRAP, (ii) HOLD, (iii) ALE

$4\frac{1}{2}+(2+2)+3$

Group—B

Answer any *one* question.

11. (a) What do you mean by the following instructions.
(i) LDA 8080H, (ii) SUB B.

(b) Explain how the 'instruction fetch' operation is executed. 4+4

12. (a) Explain the meaning of EE FROM and DRAM.

(b) Explain the working of D/A converter with proper diagram. 4+4

Group—C

Answer any *one* question.

13. Show how to expand a 32×8 RAM unit to 64×8 RAM. 4

14. Explain the difference between S-RAM and D-RAM. 4

International Assessment — 5

NEW

Part-III 3-Tier

2014

ELECTRONICS

(General)

PAPER—IVC

(PRACTICAL)

Full Marks : 15

Time : $1\frac{1}{2}$ Hours

The figures in the margin indicate full Marks.

Two experiments are to be performed, Experiments will be selected by Lucky Draw.

5×2

1. Write an assembly language program using μp 8085 which can test the all-zero condition of a 16–bit stored in the memory location X (say E060H) and x + 1. If all bits are zero it stores OO_H at location X + 2, else FF_H at some location.

2. Write an assembly language program using μp 8085 to multiply one 8 bit number with another 8 bit number stored at two consecutive memory locations using shift and add method.

3. Write an assembly language program using μp8085 to multiply one bit number with another 8 bit number stored at two consecutive memory locations using repeated addition method.

4. Write an assembly language program using μp 8085 to find the highest number in a series of data. The length is given in memory location X and the series starts from X + 1. Store the result in Y.

5. Write an assembly language program using μp 8085 to Split the data CD(H) which was earlier stored at memory location X to OC(H) and OD(H) and store them at location X + 1 and X + 2.

6. Write an assembly language program using μp 8085 to find the number of negative, positive and zero elements in a series of data length of the series of data is at X and the series starts at X + 1. Store the result at Y onwards.

7. Write an assembly language program using μp 8085 to interchange two data bytes stored at memory location X and Y (say E050H and E060H). Use indirect register addressing

8. Write an assembly language program using μp 8085 to find the 10's complement of a BCD number stored at memory location X_2X_100H and store in complemented number at memory location Y_2Y_100H.

9. *Write an assembly* language program using μp 8085 to calculate the sum of series of numbers. The length of the series is in memory location X_2X_100H and the series begins from memory location X_2X_101H. Consider the sum to be 8 bit number. So ignore carries. Store The Sum at memory location Y_2Y_100H.

10. Write an assembly language program in 8085 μp to divide 16 bit number stored in memory locations X_200H and X_201H by the 8 bit number stored at memory location X_202H. Store the quotient in memory locations X_300H and X_301H and remainder in memory locations X_302H and X_303H.

11. Write an assembly language program in 8085 μp to write a program to count number of 1's in the contents of D register and store the count in the B register.

12. Write an assembly language program in 8085 μp to find the square of the given numbers from memory location X_2X_100H and store the result from memory location Y_2Y_100H.

13. Write an assembly language program in 8085 μp to transfer ten bytes of data from one memory to another memory block. Source memory block starts from memory location X_2X_100H where as destination memory block starts from memory location Y_2Y_100H.

Distribution of Marks

		Marks
Experiment (5 + 5)	:	10
Viva–Voce	:	3
Laboratory Note Book	:	2
Total	:	15