

This question paper contains 3 printed pages.]

Your Roll No. ....

2515

A

**B.Sc. (G)/I**

COMPUTER SCIENCE—Paper II

(Computer Organization and Operating Systems)

Time : 3 Hours

Maximum Marks : 38

*(Write your Roll No. on the top immediately  
on receipt of this question paper.)*

Attempt *All* questions. Parts of a question  
must be answered together.

1. Perform the following conversions : 3
  - (i)  $(-45)_{10}$  to Binary using two's complement
  - (ii)  $0.01101$  to Decimal
  - (iii)  $100101010101$  to Hexadecimal.
2. Divide the following binary numbers in longhand : 3  
 $110111/1011$
3. Differentiate between Optical Character Recognition (OCR)  
and Optical Mark Reading (OMR). 3
4. A computer has a two address instruction format, is word  
addressable, has 32 operations code and 64 K addresses.  
Find out the length of the (i) ACC (ii) PC and (iii) IR  
(Instruction Register). 3

[P.T.O.]

5. Using theorems of Boolean Algebra, prove/disprove the following : 3

$$(X \cdot Y) \cdot (\bar{X} \cdot \bar{Z} + Z) \cdot (X \cdot \overline{Z + Y}) = 0$$

6. Obtain a truth table to design a full adder. The input bits are the addend and augend and the third bit is the carry bit from the previous stage. The output bits are the sum bit and carry bit to be propagated to the next stage. Obtain Boolean expressions for the truth table. 4
7. Differentiate between internal and external interrupt. What is an interrupt service routine ? 3
8. Write short notes on any *two* of the following :  $2 + 2 = 4$
- (i) Functions of O.S.
  - (ii) Batch O.S.
  - (iii) Multiprogramming O.S.
9. Explain paged memory system with the help of diagram. 3
10. Given the following data, draw the Gantt chart and compute the following :
- (i) Average Turn Around Time
  - (ii) Average Wait Time.

<b>Jobs</b>	<b>Estimated Run Time</b>
1	10
2	50
3	2
4	100
5	5

Use shortest job first scheduling algorithm. Assume all jobs arrived at the same time. 3

11. Draw the process state transition diagram and explain the same. 3
12. Illustrate with the help of an example Multi Level True Directory System. 3