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SB-0716

Second Year B. Sc. Examination

March / April – 2011

Electronics : Paper - IV

(Digital Electronics & Microprocessor)

Time : Hours] [Total Marks : **70**

Instructions :

(1)

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fillup strictly the details of ☛ signs on your answer book.

Name of the Examination :

☛ **S. Y. B. Sc.**

Name of the Subject :

☛ **Electronics - 4**

☛Subject Code No. : **0 7 1 6** ☛Section No. (1, 2,.....) : **Nil**

Seat No. :

Student's Signature

(2) Q.1 is compulsory .
(3) Figures at extreme right indicate full marks.
(4) Abbreviations have their usual meanings.

1 Answer in brief. **14**

(a) Define parity bit.
(b) Distinguish between synchronous and asynchronous counter.
(c) Distinguish between combinational circuit and sequential circuit.
(d) What do you understand by level, positive, and negative triggering of flip-flop ?
(e) Convert 24568_{10} and 8567_{10} to binary number.
(f) Encode 1101011101_2 to even parity Hamming Code.
(g) What do you understand by Flag register in 8085 A microprocessor ?

2 (a) Simplify the following expression using Boolean Laws. **5+5+4**

$(A+B)\left(A+\bar{B}\right)\left(\bar{A}+B\right)$ and $\bar{X}(X+Z)+\bar{A}+AZ$

(b) Add each of the following in 9's and 10's complement.
$-489_{10} + 375_{10}$ and $(-549_{10}) + (-235_{10})$

(c) Add the following in 1's and 2's complement.
$-452_{10} + 228_{10}$ and $372_{10} + 129_{10}$

OR

2 (a) Using K-map simplifies the following and implements it using appropriate hardware **5+5+4**

$E = \sum m\ (0, 1, 2, 4, 6, 8, 9, 11, 14) + d(13,15)$

$F = \pi M\ (0, 2, 3, 5, 7, 8, 10, 12, 14) + d(1, 9,15)$

(b) Draw the digital circuit diagram of the following expression.

$A\overline{B} + C\left(D + \overline{E}\right) + AD + \left(\overline{A}E + D\overline{E}\right).B$

$CDE + A\left(\overline{C} + E\right) + BC + A\left(C + DE\right)$

(C) Convert the following into its equivalent Gray code.
1110010110111_2 and 101110110101011_2

3 (a) Draw the circuit diagram for the RS Flip-flop and explain its working. Extend your discussion for the Clocked RS Flip-flop. **7+5+2**

(b) Explain the working of the D Flip-flop.

(c) State the drawback of the RS Flip-flop.

OR

3 (a) Write a program in 8085 A for finding smallest number from among the five numbers stored at appropriate consecutive memory locations. **5+5+4**

(b) Write a program in 8085 A for finding the sum of the five numbers stored at appropriate consecutive memory locations. Program should take care of the possible 16-bit resultant sum.

(c) State the importance of the 'stack' and 'stack register'.

4 (a) Draw the 3-bit ripple counter and explain its working with help of clock diagram. **5+6+3**

(b) Draw the decade counter and explain its working with help of clock diagram.

(c) Define modulo counter.

OR

4 (a) Explain the function of the state diagram with suitable example. **5+5+4**

(b) Explain the operation of shift register.

(c) Define 'State diagram' and 'state table'.

5 (a) State the application of XOR and XNOR gates. **6+4+4**
(b) Prove that NAND and NOR as universal logic gates.
(c) Design and implement half and full adder circuit.

OR

5 (a) Draw and explain, in detail the architecture of 8085 A microprocessor. **5+5+4**
(b) Explain, in detail, the flag register of 8085 A microprocessor.
(c) Explain the following instruction of 8085 A microprocessor.
ANI data , SBI data , CMP M , DAD D.