Seat No. : _____

DD-113

December-2013

5 Years M.Sc. (CA & IT) Integrated (KS) 1st Sem. FY M.Sc.

Fundamentals of Computer Organization

Time : 3 Hours] **[Max. Marks : 100**

Instructions : (1) **All** questions are compulsory.
(2) Draw diagrams wherever necessary.
(3) Only simple calculators are allowed.

1. (a) Solve any **five** : (2 marks each) **10**
   (1) Convert 131.5625 into Binary number.
   (2) Convert 1011011.001101 in to decimal number.
   (3) Perform multiplication of 16 × 2.75 in binary number.
   (4) Perform substraction of 110 – 0.111 using 1's compliment.
   (5) Convert B6C7 in to decimal number.
   (6) Convert 110110.011 into Octal number.

   (b) Explain Error detection method with parity using circuit diagram. **5**

   (c) Explain mantissa, exponent, normalization with examples in floating point representation. **5**

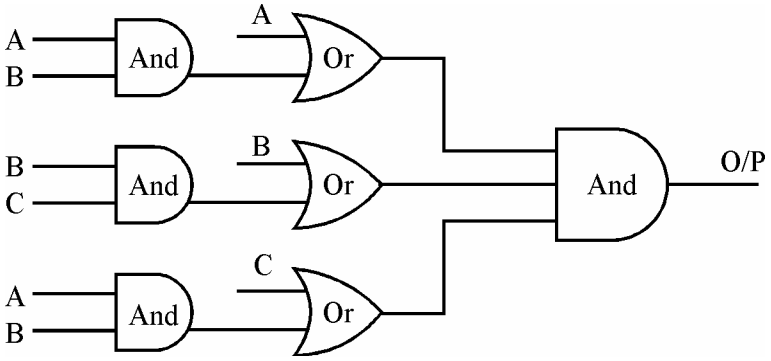
2. (a) What are universal gate ? Prove that NAND and NOR gates are universal gates. **5**

   (b) Explain Exclusive OR and Exclusive NOR gate with truth table, symbol and diagram. **3**

   (c) Explain Duality with example. **3**

   (d) Write and prove De.Morgan's theorem with Boolean expression and diagrams. **5**

   (e) Write the Boolean expression for the logic diagram given below and simplify it as much as possible. Also draw the circuit of simplified expression. **4**



3. (a) Explain Binary Adder-Substracter with circuit diagram. **5**

(b) Explain four input multiplexer with circuit and block diagram. **5**

(c) Explain full adder with diagram. **5**

(d) What are decoders ? Explain 3 to 8 decoders with truth table and block diagram. **5**

4. (a) What are printers ? List various type of printers and explain working of any three. **5**

(b) What is Asynchronous data transfer ? Explain handshaking method of asynchronous data transfer. **5**

(c) Write short note on DMA. **3**

(d) Write short note on Magnetic Disk. **3**

(e) Explain : (1 marks each) **4**

(1) DRAM

(2) EEPROM

(3) OCR

(4) MICR

5. (a) Explain the working of SR flip-flop. List various flip-flops and define flip-flop. **5**

(b) Explain Asynchronous binary counter with circuit and clock diagram. **5**

(c) Explain various type of instruction formats. **5**

(d) Reduce following expression using K-Map and implement the real minimal expression in both SOP and POS. Decide which is minimal expression. **5**

$f = \sum (0, 2, 4, 6, 7, 8, 10, 12, 13, 15)$