M.Sc. (Physics) Third Semester Old

MSc231013 – Digital Electronics & Microprocessors Paper – XIII

P. Pages : 2 **GUG/W/18/2314**

Time : Three Hours * 1 8 0 8 * Max. Marks : 80

Notes : All questions are compulsory and carry equal marks.

1. Either :

a) Explain TTL and CMOS circuits with reference to fan in / fan out, noise, speed, power dissipation with suitable examples. **10**

b) Discuss half adder and full adder by using k – map. **6**

OR

e) Explain ALU with emphasis on IC – 74181 in details. **8**

f) State different methods of number representation. Draw the logic diagram of 8 bit binary adder using IC 7483 and explain its working. **8**

2. Either :

a) Define multiplexer. Give the logic diagram and truth table for 4 : 1 multiplexer. **6**

b) Implement the expression using a multiplexer **2**
$f(A,B,C,D) = \Sigma m(0,2,3,7,9,12,14)$

c) Define demultiplexer. Give the logic diagram and truth table for 1 : 8 demultiplexer. **6**

d) Draw a pin layout of IC 74153 and give use of strobe pin. **2**

OR

e) What is pulse amplitude modulation? Explain the channel bandwidth for pulse amplitude modulation. **8**

f) Write notes on :

i) ASK **4**

ii) FSK **4**

3. Either :

a) Discuss construction and working principle of CCD. Why is it called as an ideal detector. Explain three phase change transfer mode in it. **8**

b) Discuss static and dynamic memory devices. **8**

OR

e) Discuss architecture of IC 8086. **8**

f) What are A/D and D/A convertor? Explain R – 2R Ladder D/A converters. **8**

4. Either :

a) Discuss addressing modes including simple memory paging. **4**

b) Explain instruction execution fetch and execute cycle. **4**

c) Write a notes on immediate conditional jump shift. **4**

d) Explain change control and masking. **4**

OR

e) Discuss architecture of a microprocessor. What are the important components. **8**

f) Draw a Schematic diagram of a microprocessor. Discuss function of each components in brief. **8**

5. Attempt all questions.

a) Explain Don't cave condition with suitable examples. **4**

b) Explain FDM and TDM in brief. **4**

c) Write notes on Magnetic bubble memories. **4**

d) Draw block diagram of IC 8155. **4**

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