b) An 8 bit D/A converter has a step size of 6mv. Find full scale output voltage and percentage resolution.　2

c) What is a bipolar D/A converter?　3

d) Fig 5(d) shows a computer control of motor speed. It can change motor speed from 0 to 1500 RPM. Find the number of bits of the computer so that it can control the speed within 1 RPM of required speed.　7
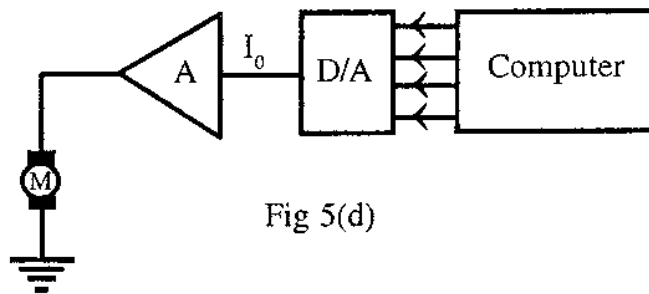

Fig 5(d)

OR

What are the performance characteristics of D/A converter?

Roll No ....

CS/EI - 303

B.E. III Semester

Examination, June 2014

Digital Circuit and System

Time : Three Hours

　Maximum Marks : 70

Note: i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.

ii) All parts of each question are to be attempted at one place.

iii) All questions carry equal marks, out of which part A and B (Max. 50 words) carry 2 marks, part C (Max. 100 words) carry 3 marks, part D (Max. 400 words) carry 7 marks.

iv) Except numericals, Derivation, Design and Drawing etc.

1. a) Write the minterm of ACD + AB and implement it.　2

b) i) $(48.625)_{10} = (\quad)_2$

ii) Divide $(IEC87)_{16}$ by $(A5)_{16}$　2

c) i) Convert binary 10110_2 to gray code.

ii) The seven bit Hamming code as received is 0010001. Assuming that even parity has been used, check is it correct? If not find correct code.　3

d) Simplify the Boolean function :

$$F(w,x,y,z) = \sum m(1,3,7,11,15) + d\sum(0,2,5) \qquad 7$$

OR

Simplify the Boolean function

$$F(w,x,y,z) = \sum m(0,1,2,4,5,6,8,9,12,13,14)$$

2. a) What is universal gate? 2

   b) Implement $y = AB + CD$ using only NAND gates. 2

   c) Implement a full adder circuit with a decoder and two OR gates. 3

   d) Draw and explain a 4 bit magnitude comparator. 7

OR

What is look-ahead carry generator? Explain with logic diagram. **rgpvonline.com**

3. a) What is Schmitt trigger? 2

   b) Implement an astable multivibrator using 555 time IC. 2

   c) Justify the statement "CMOS devices are widely used in situation where the level of electrostatic and electromagnetic noise is high". 3

   d) How a TTL gate can drive N-CMOS gates? Explain with example? 7

OR

State and explain in detail the characteristics of non-ideal logic gates.

4. a) What is boot strap memory? 2

   b) The capacity of 2K × 16 PROM is to be expanded to 16K × 16. Find the number of PROM chips required and the number of address lines in the expanded memory. 2

   c) Give a comparison of various semiconductor memories. 3

   d) Find the mod number of counter in fig 4(d). Determine its counting sequence. Draw the state diagram. Find the frequency at output Q_D if input frequency is 7kHz. 7
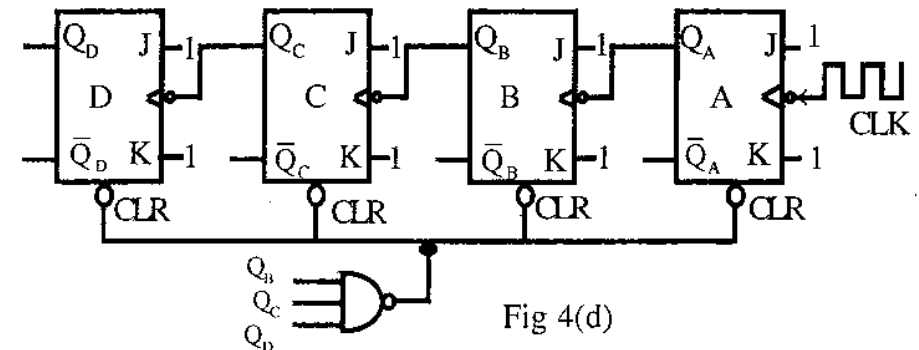

Fig 4(d)

OR

Design a combinational circuit using a ROM. The circuit accepts a 3 bit number and generates an output binary number equal to the square of the input number.

5. a) Explain quantization error. 2