Roll No .....

EX - 405

B.E. IV Semester Examination, June 2014

Electronic Devices and Circuits - II

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) Draw the frequency response characteristics of a typical op-amp. 2
b) What is a precision diode? Explain with suitable example? 2
c) Draw the circuit of an emitter coupled differential amplifier. Explain why the CMRR$\rightarrow\infty$ for a symmetrical circuit with Re$\rightarrow\infty$. 3
d) Explain the operation of square wave generator using op-amp with capacitor and output voltage waveforms. How can you obtain a non-symmetrical square wave? 7

OR

Design a square wave oscillator for f_o = 1KHz using op-amp 741 and a d.c. supply voltage of $\pm$12v.

2) a) Explain the wide band pass filter with the help of circuit diagram. 2
b) Explain the switched capacitor filter in detail. 2
c) Design a band pass second order Butter worth filter with following specification -
Lower cut-off frequency f_L = 200Hz
Upper cut-off frequency f_H = 1KHz
Pass band gain = 4
Also calculate the value of Q. 3
d) Write a short note on phase locked ICs (PLL) and their application. 7

OR

Draw the pin diagram of 555 timer and also explain function of each pin in detail.

3) a) Explain moving coil microphone with its working principle. 2
b) Explain the working of a condenser microphone. 2
c) With the help of neat diagram explain the principle of working of a ribbon microphone. 3
d) Discuss in detail of various types of sound recording system. 7

OR

What do you understand by reverberation? Explain the importance of reverberation. Write down the Sabine's equation for reverberation timer and define the terms used.

4) a) Explain in detail about TUNNETT diode. 2

b) Explain the Gunn Effect using two valley theory. 2

c) Describe the construction and principle of operation of a reflex Klystron with its applications. 3

d) What do you mean by Maser's? Explain the principle of ruby Maser's with its applications and characteristics. 7

OR

Explain in detail of backward diode? An IMPATT diode has a drift length of 8μm. Determine the drift time of a carrier and operating frequency.

5) a) Explain briefly the characteristics of MOS logic. 2

b) Explain the purpose of the totem pole output stage used in a TTL gate. 2

c) The MOS transistor is bilateral i.e. current may flow from source to drain or from drain to source. Using this property, derive a circuit that implements the Boolean function. $Y = \left(\overline{AB + CD + AED + CEB}\right)$ 3

d) Explain the switching characteristics of CMOS. Also explain the rise time and fall time in CMOS gates. 7

OR

Explain the following

i) MOS inverter

ii) CMOS inverter