

FACULTY OF ENGINEERING

B.E. 2/4 (CSE) I-Semester (Supplementary) Examination, June/July 2011

BASIC ELECTRONICS

Time : Three Hours]

[Maximum Marks : 75

Note :—Answer all questions from Part A. Answer any FIVE questions from Part B.

PART—A (Marks : 25)

1. Distinguish between diffusion current and drift current. 3
2. Draw two graphs to indicate load current versus ripple for a capacitor filter and an inductor filter used in rectifier circuits. 3
3. Which configurations of BJT (CE, CB, CC) give the highest voltage gain, highest current gain and lowest output impedance ? 3
4. Compare the application of electric and magnetic deflection fields in a CRO. 2
5. Draw the basic h-parameter equivalent circuit in CE configuration. 2
6. An amplifier has a current gain of 200 and output impedance of 3 k Ω without feedback. If negative current feedback $\beta = 0.01$ is applied, what is the output impedance of the amplifier ? 2
7. In the forward path of an oscillator, two amplifiers of equal gain are cascaded. If the feedback path transfer function is 1/81, find the gain of each amplifier. 3
8. Distinguish between photodiode and LED. 2
9. Draw the diagrams of differentiator and integrator using op-amp. 3
10. What are the universal gates ? 2

PART—B (Marks : 50)

11. (a) What is Hall effect ? Derive an expression for Hall coefficient.
- (b) Define the terms as referred to FWR circuit :
 - (i) PIV (ii) Average DC Voltage (iii) RMS current (iv) Ripple factor.

12. (a) Draw a bridge rectifier circuit and explain its working.
(b) Draw the circuit diagram of a transistor in common emitter configuration with forward bias and reverse bias and draw the input and output static characteristics.
13. (a) Calculate the values of I_C and I_B for a transistor with $\alpha = 0.99$ and $I_{CO} = 5 \mu A$. I_B is measured as $20 \mu A$.
(b) Draw a simple inverter circuit and explain its operation.
14. (a) What are the four different types of negative feedbacks employed in feedback amplifiers and show these by block diagrams along with Input and Output connections.
(b) What are the advantages of negative feedback ?
15. (a) What are the Barkhausen criteria for oscillations ? Draw the circuit of Hartley and explain.
(b) What are the characteristics of an ideal op-amp ? The input to the differentiator circuit is a sinusoidal voltage of peak value 5 mV and frequency 1 kHz. Find the output voltage if $R = 100 \text{ k}\Omega$ and $C = 1 \mu F$.
16. (a) Explain a half adder circuit with necessary truth table.
(b) How are DIAC and TRIAC different from application point of view ?
17. Write short notes on any **THREE** :—
(a) Crystal oscillators
(b) VI characteristics of PN Junction under Forward and Reverse bias conditions.
(c) Field Effect Transistor.
(d) Instrumentation amplifier
(e) LVDT strain gauge.