

**FINAL YEAR B.Sc. DEGREE EXAMINATION
MARCH/APRIL 2005**

Part III—Group II—Physics

Paper V—ELECTRONICS

Time : Three Hours

Maximum : 50 Marks

Section A

*Answer any two questions.
Each question carries 6 marks.*

1. Describe the construction and working of half wave and full wave rectifiers. Derive expressions for ripple factor and efficiency of these devices.
2. Describe the circuit of a CE transistor amplifier. Explain its working and obtain the equation for the power gain.
3. Give the theory of amplitude modulation and discuss its merits and demerits.
4. What is a Karnaugh map ? Explain how it is used to simplify Boolean expressions. Give suitable examples.

(2 × 6 = 12 marks)

Section B

*Answer any four questions.
Each question carries 3 marks.*

5. Explain the characteristics of a FET.
6. Describe the voltage divider biasing method used in a transistor circuit.
7. Describe the circuit and working of a phase shift oscillator.
8. Explain how an op.amp. can be used as an integrator and differentiator.
9. Explain the various types of antenna.
10. Explain the instruction set of 8085.

(4 × 3 = 12 marks)

Section C

*Answer any seven questions.
Each question carries 2 marks.*

11. State Thevenin's theorem.
12. What is a LED ?
13. What are h parameters of a transistor ?
14. Distinguish between DC load line and AC load line.
15. Define feedback in amplifiers.

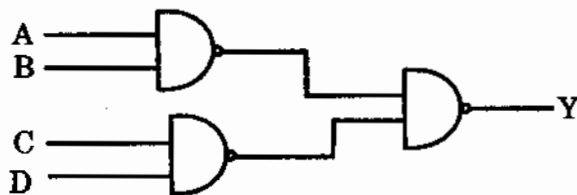
16. State Barkhausen criterion for oscillations.
17. What is the principle of superheterodyne receiver system ?
18. Distinguish between inverting and non-inverting op.amps.
19. Explain how PLL is applied for frequency modulation.
20. State De Morgan's laws.
21. Explain the D/A conversion by binary weighted resistors in brief.

(7 × 2 = 14 marks)

Section D

*Answer any four questions.
Each question carries 3 marks.*

22. If α and β are the current gains of a transistor in the CB mode and CE mode respectively, find the value of $\frac{1}{\alpha} - \frac{1}{\beta}$.
23. A feedback amplifier gives an output of 10V with an input of 0.5V. When the feedback is removed it requires 0.25V input for the same output. Calculate the feedback fraction.
24. Find the frequency of a Hartley oscillator which makes use of two inductances $\frac{0.9}{\pi^2}$ mH and $\frac{100}{\pi^2}$ μ H and a capacitance 1.6pF.
25. Find the output of the following logic circuit.



26. Convert the decimal number 27 into its equivalent i) binary and ii) hexa decimal numbers.
27. Simplify the Boolean expression.

$$\bar{A}\bar{B}\bar{C}D + \bar{A}BCD + AB\bar{C}D + ABCD.$$

28. Write an assembly language program to add two 8 bit numbers whose sum is also an 8 bit numbers.

(4 × 3 = 12 marks)