

D 70336

(Pages : 3)

Name.....

Reg. No.....

FIFTH SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2019

(CUCBCSS—UG)

Physics/Applied Physics

PHY 5B 09/APY 5B 10—ELECTRONICS (ANALOG AND DIGITAL)

Maximum : 80 Marks

Time : Three Hours

Section A (One Word)

Answer all questions.

Each question carries 1 mark.

1. What is current amplification factor ?
2. What is ripple factor ?
3. Explain voltage gain.
4. Find $A + A \cdot B =$ _____.
5. Which is called universal gate ?

Write True or False :

6. The only function of NOT gate is to invert input signal
7. RC coupling is used for current amplification.
8. The best frequency response is of direct coupling.
9. Oscillators employ positive feedback.
10. The value of α of a transistor is less than one.

(10 × 1 = 10 marks)

Section B (Short Answer Type)

Answer all questions.

Each question carries 2 marks.

11. Draw the input and output characteristics of CB connection. What do you infer from these characteristics ?
12. Write a short note on operating point.

Turn over

13. Compare half wave and full wave rectifier.
14. Mention the essentials of a biasing circuit.
15. What do you understand by single stage transistor amplifiers ?
16. Explain frequency response.
17. Simplify the expression $Y = A \cdot B \cdot C + B \cdot C$.

(7 × 2 = 14 marks)

Section C (Paragraph Type)

*Answer any five questions.
Each question carries 4 marks.*

18. Explain AND function with a 2- input AND gate.
19. What are upper and lower side frequencies in AM.
20. How will you get frequency response comparable to RC coupling in a transformer coupling ?
21. Briefly explain the working of a Hartley Oscillator.
22. Explain the operation of transistor as an amplifier.
23. How will you draw d.c. load line on the output characteristics of a transistor ? What is its importance ?
24. Why are transistor amplifiers always operated above knee voltage region ?

(5 × 4 = 20 marks)

Section D (Problems)

*Answer any four questions.
Each question carries 4 marks.*

25. A CE-connected transistor has $\beta = 50$ and $I_B = 20\mu\text{A}$. Compute the values of I_C and I_E .
26. A transistor has the following ratings : $I_{C(\text{max})} = 500 \text{ mA}$ and $\beta_{\text{max}} = 300$. Determine the maximum allowable value of I_B for the device.
27. An amplifier has a voltage gain of 132 and $\beta = 100$. Determine the power gain and output power of the amplifier if the input power is $50\mu\text{W}$.
28. A certain amplifier has voltage gain of 15 dB. If the input signal voltage is 0.8V. What is the output voltage ?

29. A single stage amplifier has a voltage gain of 60. The collector load $R_c = 500\Omega$ and the input impedance is $1k\Omega$. Calculate the overall gain when two stages are cascaded through R-C coupling.
30. Convert $(B2F)_{16}$ to octal.
31. Convert decimal number 378 to a 16-bit number by first converting to hexadecimal.

(4 × 4 = 16 marks)

Section E (Essays)

Answer any two questions.

Each question carries 10 marks.

32. What is modulation? Discuss about frequency modulation and amplitude modulation.
33. What is the importance of De Morgan's theorems in Boolean Algebra and what are the advantages of Boolean theorems?
34. Describe the various methods used for transistor biasing? State their advantages and disadvantages.
35. Give a brief account on feedback in amplifier. Also discuss about principle of negative feedback and their advantages.

(2 × 10 = 20 marks)