

D 30198

(Pages : 4)

Name.....

Reg. No.....

**FIFTH SEMESTER (CUCBCSS-UG) DEGREE EXAMINATION
NOVEMBER 2022**

Physics/Applied Physics

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

(2017—2018 Admissions)

Time : Three Hours

Maximum : 80 Marks

Section A*Answer all questions.**1 mark each.*

1. Define current amplification factor.
2. Write the relation connecting emitter, base and collector currents.
3. What is the use of C_E in an amplifier.
4. Mention Various circuit currents in an amplifier circuit
5. A CE amplifier is also called _____ circuit.
 - (i) Grounded emitter.
 - (ii) Grounded base.
 - (iii) Grounded collector.
 - (iv) None of the above.
6. What is a multistage transistor amplifier. RC coupling is used for _____ amplification.
 - (i) Voltage.
 - (ii) Current.
 - (iii) Power.
 - (iv) None of the above.
7. 1 db corresponds to _____ change in power level.
 - (i) 50%.
 - (ii) 35%.
 - (iii) 26%.
 - (iv) 22%.
8. Draw the symbol of not gate.
9. In Boolean algebra, the bar sign (-) indicates _____.
 - (i) OR operation.
 - (ii) AND operation.
 - (iii) NOT operation.
 - (iv) None of the above.

Turn over

10. What is binary number system ?

(10 × 1 = 10 marks)

Section B

Answer all questions.

Write in two or three sentences.

2 marks each.

11. Draw the figure of a full wave bridge rectifier.
12. What is the purpose of using filters in a circuit ?
13. What is a voltage multiplier ?
14. Explain operating point.
15. Describe the transistor action in detail.
16. Draw the truth table and symbol of a NAND gate.
17. State De Morgan's theorems.

(7 × 2 = 14 Marks)

Section C

Write any five questions.

Write in one paragraph.

4 marks each.

18. Explain different types of filter circuits.
19. With figure explain voltage halfwave doubler.
20. Derive the relation between α and β .
21. Compare various transistor circuits.
22. Mention the steps that are taken to design the transistor biasing and stabilisation circuits.
23. Explain the working of a Hartley oscillator.
24. With examples write a note on various number systems.

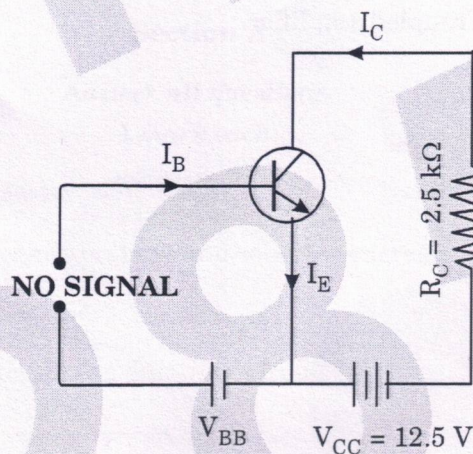
(5 × 4 = 20 marks)

Section D

Solve any **four** problems.

4 marks each.

25. Find the value of β if : (i) $\alpha = 0.9$; (ii) $\alpha = 0.98$; and (iii) $\alpha = 0.99$.
26. For the circuit shown, draw the DC load line :



27. The applied input a.c. power to a half-wave rectifier is 100 watts. The d.c. output power obtained is 40 watts : (i) What is the rectification efficiency ? ; and (ii) What happens to remaining 60 watts ?
28. In a transistor circuit, collector load is $4\text{k}\Omega$ whereas quiescent current (zero signal collector current) is 1mA .
- What is the operating point if $V_{CC} = 10\text{V}$?
 - What will be the operating point if $R_C = 5\text{k}\Omega$?
29. Find the gain in db in the following cases :
- Voltage gain of 30
 - Power gain of 100
30. A half-wave rectifier is used to supply 50V d.c. to a resistive load of $800\ \Omega$. The diode has a resistance of $25\ \Omega$. Calculate a.c. voltage required.
31. In a common base connection, $I_C = 0.95\text{ mA}$ and $I_B = 0.05\text{ mA}$. Find the value of α .

(4 × 4 = 16 marks)

Section E

Write any **two**.
10 marks each.

32. With figure explain CE amplifier. Express the equation for gain
33. Explain with figure Biasing with Collector Feedback Resistor. Explain the advantageous and disadvantageous.
34. With figure explain two types of full wave rectifiers
35. With figure explain RC coupled amplifier.

(2 × 10 = 20 marks)