D5BPH2204 **Reg. No.....**

Name: .....

FIFTH SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2024

(Regular/Improvement/Supplementary)

PHYSICS

GPHY5B09T: ELECTRONICS (ANALOG & DIGITAL)

Time: 2 Hours **Maximum Marks: 60**

SECTION A: Answer the following questions. Each carries *two* marks. (Ceiling 20 marks)

1. What is the nature of output from a rectifier?
2. What is ripple factor? What is its value for a half wave and full wave rectifier?
3. Enlist the functions of capacitor and choke in filter circuits.
4. Draw the input and output characteristics of CE amplifier circuit.
5. What is the largest decimal number that can be represented in binary with eight bits? Find the 2's compliment of 10111000.
6. How does an Exclusive OR gate differ from an OR gate in logical operations?
7. Convert 467.3_{10} to binary and octal number system.
8. What is meant by positional number system?
9. What are damped and undamped electrical oscillations?
10. List the characteristics of an ideal Op- Amp.
11. Differentiate between the inverting and non-inverting inputs of an Op-Amp.
12. What is meant by racing in flip-flops?

SECTION B: Answer the following questions. Each carries *five* marks. (Ceiling 30 marks)

13. Discuss how to construct OR gate using NAND and NOR gates.
14. Add two numbers: 1110 and 1011 in binary.
15. State and explain De- Morgan's theorems.
16. In a transistor circuit, collector load is 330Ω, R_B is 47 kΩ, V_{BB} is 10V and V_{CC} is 20V. Determine the q point of the transistor circuit. Also draw the DC loadline. Given $\beta = 200$ and $V_{BE} = 0.7V$.
17. What are filter circuits? Explain capacitor input filter and π filter.
18. When negative feedback is applied to an amplifier of gain 100, the overall gain falls to 50. (i) Calculate the fraction of the output voltage feedback. (ii) If this fraction is maintained, calculate the value of the amplifier gain required if the overall stage gain is to be 75.
19. Explain how Zener diode maintains constant voltage across the load.

SECTION C: Answer any *one* question. Each carries *ten* marks.

20. With neat diagrams explain the working of a full wave bridge rectifier. Derive an expression for its efficiency.
21. Discuss the construction and working of RC coupled amplifier. Discuss its frequency response, advantages and disadvantages and applications.

(1 × 10 = 10 Marks)