QP CODE: 26802035

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Reg No : .....

Name : .....

INTEGRATED M Sc DEGREE EXAMINATION APRIL 2026

Second Semester

INTEGRATED M Sc BASIC SCIENCES - PHYSICS

CORE - IPH2CR03 - DIGITAL ELECTRONICS AND COMMUNICATION

2021 Admission Onwards

D57383B8

Time: 3 Hours

Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

*Weight **1** each.*

1. How can a NOT gate be obtained from a NAND gate?
2. Draw logic diagram to implement the Boolean expression.
3. What is 4 bit adder/subtractor?
4. What is the principle of Multiplexer?
5. What is the working principle of decoder?
6. What is serial in serial out register?
7. Which transistor configuration is used for AM generation?
8. Explain the basic principle of FM detection.
9. How can we generate PPM from PWM?
10. What is superhetrodyning?

(8×1=8 weightage)

Part B (Short Essay/Problems)

*Answer any **six** questions.*

*Weight **2** each.*

11. Prove the complementarity law of Boolean algebra with the help of a truth table.
12. Verify the following Boolean identity by perfect induction method XYZ+X'YZ+XYZ'=YZ+XYZ'
13. Among the following Boolean expressions, list the SOP, POS and Non-Standard forms. Give reasons for Non Standard forms.(a) (A'+B+C')(A'+C); (b) A'BC'+A'C; (c)(X+Y'+Z')(Y'+Z')(X'+Y'); (d) (A+B+C')'(A+C')'; (e) (ABC)'+AB'C

14. What is Half- subtractor? What is the use of subtractor?

15. Explain the working of SR flip flop with truth table and circuit diagram.

16. With neat sketches, explain 3-bit binary ripple counter.

17. A broadcast radio transmitter radiates 10KW when the modulation percentage is 60. How much of this is carrier power?

18. With a neat diagram explain FM generation using VCO.

(6×2=12 weightage)

Part C (Essay Type Questions)

*Answer any **two** questions.*

*Weight **5** each.*

19. Explain in detail Karnaugh Map method of simplification of Boolean expressions. Give an example each for 2-variable and 3-variable case

20. What is the basic principle of ADC? Explain the operation of successive approximation type of ADC.What are the application of ADC?

21. Define FM. Derive the expression for FM signal.

22. Explain the principle of detection of amplitude modulation (AM) waves using a diode detector. Discuss the working mechanism of the diode detector and how it extracts the original message signal from the modulated carrier.

(2×5=10 weightage)