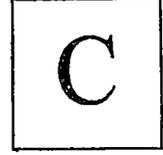


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***B.Tech. Degree III Semester Regular/Supplementary Examination
in Marine Engineering November 2024***

**19-208-0304 MARINE ELECTRONICS
(2019 Scheme)**

Time: 3 Hours

Maximum Marks: 60

Course Outcome

On successful completion of the course, the students will be able to:

- CO1: Understand the circuit and working of Power Amplifiers, Operational Amplifiers and linear Op-amp circuits.
- CO2: List and explain the different number system and their conversions, binary codes and boolean algebra. To acquire knowledge on logic gates and its application in digital circuits like multiplexers, flip-flops, counters and registers.
- CO3: Learn analog to digital converters and digital to analog converters and basic programming of 8085 microprocessor.
- CO4: Understand the basic structure and working of semiconductor memories and industrial electronics devices.
- CO5: Gain basic knowledge on communication system and its application in different communication system.

Bloom's Taxonomy Levels (BL): L1 – Remember, L2 – Understand, L3 – Apply, L4 –Analyze, L5 – Evaluate, L6 – Create

PI – Programme Indicators

(Answer *ALL* questions)

(5 × 15 = 75)

| | | Marks | BL | CO | PI |
|-----------|---|-------|----|----|----|
| I. | (a) Explain how power amplifier is different from voltage amplifier. Discuss the techniques used to disperse the heat generated by power amplifier. | 8 | L2 | 1 | 1 |
| | (b) With a neat circuit diagram explain class AB power amplifier. | 7 | L2 | 1 | 1 |
| OR | | | | | |
| II. | (a) Explain using a neat circuit integrator and differentiator using operational amplifier. | 8 | L1 | 1 | 1 |
| | (b) Discuss on operational amplifier and ideal operational amplifier characteristics in detail. Explain how it is different from practical operational amplifier. | 7 | L2 | 1 | 1 |
| III. | (a) Using Boolean postulates, laws and axioms prove that $A\bar{B}C + B + B\bar{D} + AB\bar{D} + \bar{A}C = B + C$. | 8 | L3 | 2 | 1 |
| | (b) What are Registers? Explain 4 bit SIPO right shift register with neat sketch. | 7 | L3 | 2 | 1 |
| OR | | | | | |
| IV. | (a) Explain S-R flip flop. Explain its advantages and disadvantages. Explain how can you overcome the disadvantages. | 8 | L4 | 2 | 1 |
| | (b) Derive XOR gate from NAND and NOR gates. | 7 | L3 | 2 | 1 |

(P.T.O.)

BT MRE-III(R/S)-11-24-3441

| | | Marks | BL | CO | PI |
|-----------|---|-------|----|----|----|
| V. | (a) Explain the different registers of 8085 microprocessor. Explain flag register with an example. | 8 | L2 | 3 | 1 |
| | (b) Explain counting type ADC. Explain how it is different from tracking type ADC. | 7 | L2 | 3 | 1 |
| OR | | | | | |
| VI. | (a) Write an assembly language program to evaluate the expression $Z=3+X^2$, where X is a number available at memory location 9000 H. Store the result in 9001 H. (Discard the carry). | 10 | L3 | 3 | 1 |
| | (b) Elaborate the need of DAC. Explain any one application. | 5 | L2 | 3 | 1 |
| VII. | (a) With a neat circuit explain CMOS NOR gate. | 8 | L2 | 4 | 1 |
| | (b) Explain how reading and writing operation is performed in a RAM. | 7 | L2 | 4 | 1 |
| OR | | | | | |
| VIII. | (a) Explain PROM in detail. | 9 | L2 | 4 | 1 |
| | (b) Elaborate on photo electric effect. Explain any one application. | 6 | L2 | 4 | 1 |
| IX. | (a) Explain AM radio transmitter system using a neat block diagram. | 7 | L1 | 5 | 1 |
| | (b) Differentiate the terms modulation and demodulation. Explain AM, FM and PM in detail. | 8 | L2 | 5 | 1 |
| OR | | | | | |
| X. | (a) Explain satellite communication system using a neat block diagram. | 8 | L1 | 5 | 1 |
| | (b) Describe the importance of GMDSS onboard ship. Explain any two GMDSS equipment used onboard ship. | 7 | L2 | 5 | 1 |

Blooms's Taxonomy Level

L1 – 16%, L2 – 58%, L3 – 21%, L4 – 5%.
