COCHIN UNIVERSITY OF SCIENCE AND TECHNOLOGY

B.TECH. DEGREE III SEMESTER REGULAR EXAMINATION IN MARINE ENGINEERING DECEMBER 2020

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

Time: 30 Minutes [for Answering and Scanning/Uploading the page of the Answer Sheet] per module
Max. Marks: 8 per module

INSTRUCTIONS
1. You have to be available in Google Meet Video Camera throughout the examination hours.
2. Those students who are not present through Google Meet Video Camera will not be permitted to write the online examination.
3. You have to share your '**live location**' to the faculty before uploading the answer sheet.
4. You have to answer only one question per module.
5. You have to write register number, subject code and module/group number (as given in the question paper) in each page.
6. Answer may not exceed one page of an A4 size paper in a standard handwriting, as far as possible.
7. If at all an answer goes beyond one page, (due to your handwriting) another page can also be used. In such a situation, the page number should be given as 1/2, 2/2.
8. You have to put the Question Number correctly.
9. After answering the question, you have to scan in pdf format and upload the answer page in a format of <reg. no.><module/group no.><question no.>.pdf.

MODULE - I
(Answer *ANY ONE* question)

I(1).   What is crossover distortion? How it is eliminated using complementary symmetry class AB biased push pull Amplifier? Draw neat diagram and explain its working.   (8)

OR

I(2).   (a)   An inverting amplifier has Rf= 500 k Ω and R1= 5 k Ω and input voltage of 0.1 V pp. Draw the inverting amplifier diagram and determine the amplifier circuit voltage gain, input resistance, output voltage (peak to peak), maximum operating frequency if slew rate is 0.5 v/µs.   (4)

     (b)   Draw the circuit of a differentiator using opamp and derive the expression for output voltage.   (4)

MODULE - II
(Answer *ANY ONE* question)

II(1).   (a) Reduce following boolean function using K MAP.   (5)
F(A, B, C, D) = Σm (0, 1, 2, 5, 7, 8, 9, 10, 13, 15)

      (b) Realize XOR function using NAND gate along with necessary Boolean algebra   (3)
minimization.

OR

II(2).   (a) Expand A' + B' to min terms and maxterms.   (4)

   (b) Design a MOD 10 Asynchronous counter using T flipflop along with its truth table.   (4)

MODULE - III
(Answer *ANY ONE* question)

III(1).   Draw neat circuit diagram and explain the working and applications of any one   (8)
type of ADC and DAC.

OR

III(2). (a) Write an 8085 microprocessor assembly language program (along with   (5)
algorithm and necessary comments) for BINARY DIVISION. The divisor is
stored in memory location 4151H, dividend is stored in 4152H. The reminder
and quotient should be stored in 4153H and 4154H respectively.

   (b) Draw the flag register of 8085 microprocessor, label the flags and give its status   (3)
after any arithmetic or logical operation.

MODULE - IV
(Answer *ANY ONE* question)

IV(1). Describe the working of TTL NAND and CMOS NOR gate along with neat diagram. (7)

OR

IV(2). (a) The gate current in a thyristorised half wave rectifier is adjusted to 1.25 mA and the forward breakdown voltage of SCR corresponding to this gate current is 110 V. The applied voltage is 220 V, the load resistance is 150 Ω and the holding current is zero. (5)
Determine:
  (i) Firing angle
  (ii) Conduction angle
  (iii) Average output voltage
  (iv) Average current
  (v) Power output

(b) What is the use of a free wheeling diode in a phase controlled rectifier with R- L load? List out its advantages.

MODULE - V
(Answer *ANY ONE* question)

V(1). (a) With neat block diagram draw and explain the working principle of FM super heterodyne receiver? (5)

(b) A carrier wave of 400 watts is subjected to 80% amplitude modulation. (2)
Determine:
  (i) power in sidebands
  (ii) power of modulated wave

OR

V(2). Draw neat diagram and describe the three analog pulse modulation techniques and give its comparison and applications. (7)

(2)

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