INDIAN MARITIME UNIVERSITY
Time Bound Assignment
B Tech (ME) Arrear Examinations
September/October 2020
UG11T1302 / 2302
Electronics

Date: 10/09/2020	Max Marks: 70
Duration: 3 Hrs	Pass Marks: 35

Part – A (compulsory)

Answer the following (10x2=20 Marks)

1. Design AND gate using NAND gate only.
2. Write the difference between BJT and JFET.
3. Convert the following binary numbers to Gray Code
   (i) 1110 (ii) 1011.
4. CMRR (Common Mode Rejection Ratio) for a differential amplifier should be
   a. Zero b. Infinity c. Unity d. large
5. State the advantages of negative feedback.
6. What is Barkhausen criteria for sustained oscillation?
7. Define modulation Index for AM.
8. Which of the following options is not a component of a RADAR system?
   a. Transmitter b. Antenna c. Duplexer d. Sequencer
9. Which class of amplifiers exhibit cross-over distortion in worst form—
   a. Class A b. Class B c. Class AB d. None of these
10. Why self-bias is more desirable than fixed bias for transistor biasing?

Part – B

Answer any 5 out of 7 questions (5 x 10= 50 marks)

11. (a) Draw and explain Wien Bridge Oscillator. **(5 marks)**

(b) Draw the diagram of Class-B Push-Pull Amplifier and explain its working. **(5 marks)**

12. (a) Prove that in amplitude modulation (AM) total carrier power $Pt=Pc\ (1+m_a^2/2)$. Where Pc is the carrier power and m_a is the modulation index. **(5 marks)**

(b) A 10 kW carrier wave is amplitude modulated of 80% depth of modulation by a modulating signal. Calculate side band power and total power AM wave. **(5 marks)**

13. (a) Minimize the following Boolean expression using K-map,
$Y = = \Sigma\, m(0,2,3,5,6,7,8,10,11,14,15)$. **(5 marks)**

(b) Draw the truth table of full adder circuit and obtain the expression of Sum and Carry. **(5 marks)**

14. (a) Explain the working of a Positive Clamper with diagram.**(5 marks)**

(b) With neat diagram explain the working of CMOS inverter (NOT gate.) **(5 marks)**

15. Draw and explain the working and construction of CRO. Also, explain how voltage can be measured using CRO. **(10 marks)**

16. (a) Draw and explain V-I characteristics of SCR. **(5 marks)**

(b) Explain the following terms used in SCR: latching current, holding current, forward break over voltage, reverse break down voltage, minimum gate current. **(5 marks)**

17. (a) List the ideal characteristics of ideal operational amplifier. **(5 marks)**

(b) Draw and explain the circuit of weighted resistor digital to analog converter (DAC). **(5 marks)**

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