

INDIAN MARITIME UNIVERSITY

(A Central University, Government of India)

END SEMESTER EXAMINATION December 2017

Programme: B.Tech (Marine Engineering)

Semester: III

Subject Name: Electronics

Subject Code: UG11T2302/

UG11T1302

Date: 07.12.2017

Maximum Marks: 100

Time: 3Hr.

Pass Marks: 50

PART – A

Marks:10X3=30

(All questions are compulsory)

1. (a) Describe the operation of *S-R Flip-Flop* with suitable truth table?
- (b) What is *CMRR* and *SLEW RATE* of an *OPAMP* ?
- (c) What is *Program Counter*?
- (d) Realize digital circuit using logic gates of given function $f(A,B,C) = \bar{B} + \bar{B}\bar{C} + \bar{A}B + AB\bar{C}$
- (e) What are the differences between MOSFET and JFET.
- (f) Construct a *NOT Gate* with a *NAND Gate*.
- (g) If a CB fixed biased NPN transistor amplifier have current gain $\alpha = 0.98$, what will be value of β for the same?
- (h) Find the minimum length of Antenna for a TV broadcasting station, which is operated at 300 MHz frequency?
- (i) Why positive feedback is used in oscillators.
- (j) Why cascading techniques are using in amplifier design, name one kind of such amplifier.

PART – B

Marks:5X14=70

(Answer any 5 of the following)

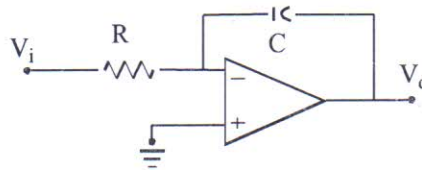
2.

- (a) Solve the following *K-Map* to get solution in *SOP* form and draw the gate level circuit diagram, $f(w,x,y,z) = \sum(3,7,8,9,10,15)$ & *don't care* = (0,2,4,5,11).

3. (b) Design and describe the operation of a *3-bit Ripple Carry Adder* 7
- (a) A CE Power amplifier, the load resistance in the collector circuit is $5\text{ K}\Omega$ and $V_{cc} = 14\text{ V}$. find Q-point or operating point, at zero signal base current is $40\ \mu\text{A}$ with CE current gain $\beta = 100$. 7

- (b) Why Self biased is advantageous over fixed biased techniques, if β is the current gain of the amplifier prove that at fixed biased, stability factor: $S = \beta + 1$ 7

4. (a) Find the output voltage V_o of the circuit shown below. 7



- (b) What are the characteristics of an Ideal OPAMP? Why it is necessary to adjust/compensate the Offset in an OPAMP? 7

5. (a) Explain Barkhausen's criterion for sustainable oscillation, Why negative feedback is used in Amplifier design? 7

- (b) A two stage RC coupled amplifier has a voltage gain of 84. The output resistance of the amplifier is $42\text{ K}\Omega$. Amplifier is now provided 25% negative voltage feedback in series with the input. Calculate Voltage gain and output resistance with feedback 7

6. (a) For a transmitting AM radio station, prove that transmitting power $P_t = P_c (1+ m_a^2 / 2)$, where p_c is the carrier power and m_a is the modulation index. 7

- (b) A broadcast transmitter radiates 10 KW , when the percentage modulation is 75 %. Calculate the total carrier power when the modulation has been reduced to 50 %. 7

7. (a) Draw and Explain Push Pull power amplifier. 7

- (b) Explain briefly architecture and operations of a CRO. 7

8. (a) With a Suitable circuit diagram explain CMOS inverter 7

- (b) What are the various registers of 8085? Discuss their function. 7
