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 $f(A,B,C) = \bar{B} + \overline{BC} + \overline{A}B + AB\bar{C}$

(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 α = 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, $f(w,x,y,z) = \sum(3,7,8,9,10,15)$ & $don't\ care = (0,2,4,5,11)$. 7

(b) Design and describe the operation of a *3-bit Ripple Carry Adder* 7

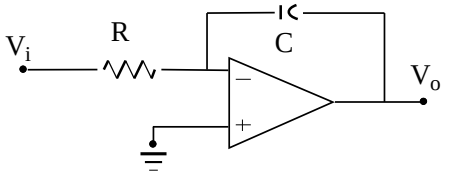
3.

(a) A CE Power amplifier, the load resistance in the collector circuit is 5 K Ω and Vcc =14 V. find Q-point or operating point, at zero signal base current is 40 μA with CE current gain β = 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 KΩ. 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 pc is the carrier power and ma 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

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