

**INDIAN MARITIME UNIVERSITY**  
(A CENTRAL UNIVERSITY, GOVT. OF INDIA)  
**End Semester Examination December 2018**  
**B. Tech. (Marine Engineering)**  
**Semester - III**  
**Analog Electronics and Communication(UG11T3302)**

Date: 29-12-2018  
Time: 3 Hrs.

Max Marks: 100  
Pass Marks: 50

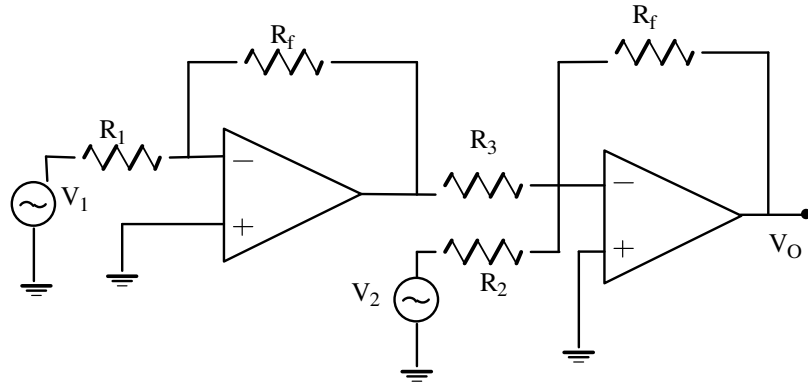
**PART-A**  
**All questions are compulsory**

1. **10 x 3 = 30 Marks**
- (a) Which class of amplifier operates with least distortion  
i) Class-A ii) Class-B iii) Class-AB iv) Class-C
  - (b) What is *offset* in OPAMP? Why it is required to adjust the *offset*?
  - (c) What are the differences between JFET and MOSFET?
  - (d) What is the importance of *Q point* in Transistor operation?
  - (e) Explain the condition of negative feed back
  - (f) Mention some applications of rader.
  - (g) Define *Modulation* and name the different types of modulation?
  - (h) List the effect of *negative feed back* in amplifier
  - (i) What is *Barkhausen Criterion* for oscilation?
  - (j) Define *Drain Resistance, Transcondctance* of FET.

**PART-B**  
Answer **ANY FIVE** of the following

2. (a) With a neat sketch describe the constructuion of an *n- channel* (7)  
*JFET*. Explain its principles of operation.
- (b) Show that *input impedance* of series-shunt feedback amplifier (7)  
and shunt-series feedback amplifier are  $Z_{if}=Z_i(1+A\beta)$  and  
 $Z_{if}=Z_i/(1+A\beta)$  respectively
3. (a) Explain with suitable circuit diagram working of *Complementary* (7)  
*symmetry Push-pull class-B* amplifier
- (b) Find the *Stability factor*  $S, S'$  and  $S''$  with respect to  $\delta\beta, \delta V_{BE}$  and (7)  
 $\delta I_{co}$  for common emitter fixed bias amplifier
4. (a) With suitable circuit diagram explain the working of *Wien bridge* (7)  
*Oscillator*.
- (b) Wien Bridge Oscillator is to span a range of frequency from 30Hz (7)  
to #0 KHz. The variable capacitance can be changed from 50pf  
to 500pf. Find the resistance needed to span the frequency  
range. If the gain of the amplifier is 6, what must be the ratio of  
the resistance in the other arm of the bridge.

5. (a) Explain with suitable circuit diagram the working of negative *Diode clipper* . Distinguish between clipping and clamping circuits. (7)
- (b) With suitable circuit diagram describe the working Schmitt Trigger (OPAMP based) (7)
6. (a) Determine the out put of the circuit with components  $R_f=1M\Omega$ ,  $R_1=100K\Omega$ ,  $R_2=40K\Omega$  and  $R_3=400K\Omega$  (7)



- (b) Describe with appropriate circuit diagram the working of IC 555 based Monostable Multivibrator (7)
7. (a) Draw and explain the construction and working principle of *SCR*. (7)
- (b) Draw the structure and output V-I characteristic of IGBT and explain its operation (7)
8. (a) The Peak to peak value of an AM voltage has a maximum value of 8V and minimum value of 2V. What is the percentage modulation and the amplitude of unmodulated carrier. (7)
- (b) Discuss the basic principle of *RADAR* system (7)

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