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INDIAN MARITIME UNIVERSITY

(A CENTRAL UNIVERSITY, GOVERNMENT OF INDIA)

B.TECH (MARINE ENGINEERING)

DECEMBER2014/JANUARY END SEMSTER EXAMINATION

III SEMESTER

ELECTRONICS (T-2302 / T 1302)

Time : 03.00 Hrs | Max Marks : 100

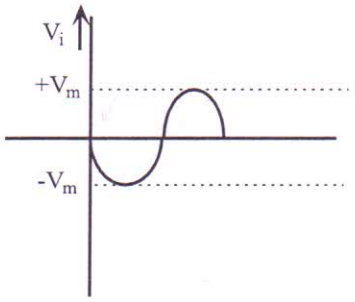
Date:24-12-2014 | Pass Marks : 50

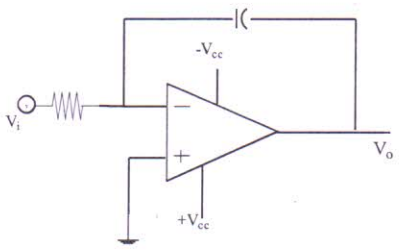
PART- A (3 × 10 = 30 Marks)
Compulsory Questions

1. 3x10= 30

a) Describe the operation of J-K-flip-flop with State diagram. 3

b) If input to the circuit shown below is 3





c) Implement the function with 4:1 MUX 3

$$f(A,B,C) = \sum(1,2,4,7)$$

d) Minimize the function using K-map 3

$f(A,B.C,D) = \sum(0,2,4,5,8,9,11)$ & $don't\ care = (3,7,10,15)$.

e) Find the equivalent *gray code* of given binary numbers 10101, 11101 3

f) List the *ideal characteristic* of an OP-AMP. 3

g) Discuss the advantages of SSB system in radio telephony. 3

h) State the advantages of negative feedback 3

i) Why self bias is more desirable than fixed bias for transistor biasing? 3

j) Chose the correct alternative: The colour of the spot on the screen of a CRO depends on 3

(1) Intensity of electron beam (2) Frequency of the deflection voltage
(3) Coating material of the screen

PART - B (5x14 = 70 Marks)

Answer any five from the following eight questions

2.

a. Design a BCD adder circuit. Draw the logic circuit diagram. 7

b. Briefly discuss the construction and working of ***4-bit shift register.*** Also show the *Timing Diagram* of the counter. 7

3.

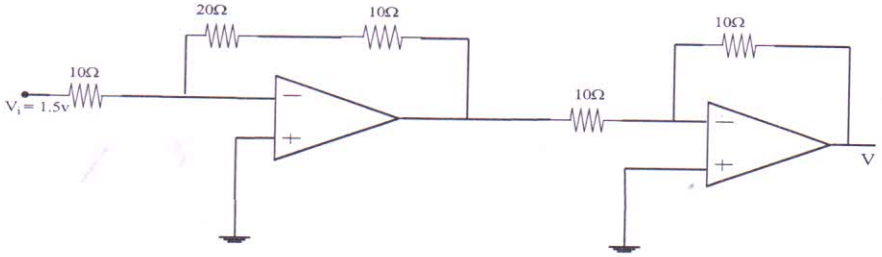
a) Design a *BCD to 7-segment decoder.* 10

b) Realize a two input ***NOR GATE*** using TTL and briefly discuss its operation. 4

4.

a. What is *Input offset current*. How effect of Input offset current is compensated in op-amp 7

b. Find the output voltage V_o of the circuit shown below. 7



5.

a. How can signal are classified in 8085 microprocessor. Describe briefly accumulator register 8

b. Draw and explain CRO 6

6.

a. Draw and explain operational principle of any Thyristors 7

b. What are the advantages of a negative feedback and Draw and explain class A Amplifier. 7

7.

a. Explain with diagram for MOSFET 7

b. A germanium transistor has a collector cut off current I_{CBO} = 14 μA at room temperature and β = 50. It is used in common emitter amplifier. 7

(1) Calculate the collector current when the base current is 0.2 mA.

(2) Assuming β does not change with temperature, find the new collector current, if the temperature of the transistor rises through 50^0.

8.

a. Draw a fixed biased circuit. Explain why the circuit is unsatisfactory if the transistor is replaced by another of the same type. 7

b. Explain Wine bridge Oscillator 7
