

i) Integrator

ii) Differentiator.

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## P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belgaum)

### First Semester, B.E. – Semester End Examination; Dec. - 2015

# **Electronic Device and Communication** (Common to all Branches)

Time: 3 hrs Max. Marks: 100

Note: Answer FIVE full Questions, selecting ONE full question from each unit. UNIT - I 1 a. What is the need of DC load line? Explain the procedure to draw DC load line for circuit 8 consisting of DC source, Diode and resistance which are connected in series. b. Determine the currents  $I_1$ ,  $I_2$  and  $I_{D2}$  for the network shown in Fig.1.b 6 c. With a neat circuit diagram and waveform explain the operation of negative clamper. 6 2 a. With neat diagram, explain the operation of transmissive and reflective field effect LCD. 8 b. Sketch the output voltage V<sub>0</sub> and determine the dc level of output for the network shown in 6 Fig.2.b. Repeat the same when ideal diode is replaced by Si diode. c. Determine and sketch the output waveform for sinusoidal input shown in Fig 2.c 6 **UNIT - II** 3 a. Sketch and explain the construction and discuss the V-I characteristics of N-channel 8 enhancement type MOSFET. b. The network of Fig.3.b. has  $V_{GSO} = 0.35 \text{ V}$  and  $I_{DO} = 7.6 \text{ mA}$ i) Determine  $g_m$  and compare to  $g_{mo}$ ii) Find r<sub>d</sub> 6 iii) Sketch the ac equivalent of Fig.3b iv) Find Z<sub>i</sub>, and v) Find  $Z_0$ . c. With a neat circuit diagram explain the operation of Ideal RC phase shift oscillator. 6 4 a. Derive an expression for A<sub>v</sub> of E-MOSFET voltage divider configuration. 7 b. The network of Fig.4.b. has  $k = 0.24 \times 10^{-3} \text{ A/V}^2$ ,  $V_{GSQ} = 6.4 \text{ V}$  and  $I_{DQ} = 2.75 \text{ mA}$ . i) Determine  $g_m$  and find  $r_d$ ii) Find Zi with and without r<sub>d</sub>. 7 iii) Find Z<sub>o</sub> with and without r<sub>d</sub> iv) Find Av with and without r<sub>d</sub> c. Determine  $I_{DO}$ ,  $V_{GSO}$  and  $V_D$  for circuit shown in Fig. 4.c. 6 **UNIT - III** 5 a. Discuss the DC bias operation of differential amplifier designed using BJT. b. Write a neat circuit diagram, and output equation for OP-AMP

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c. Design the bandpass filter for following specification,

$$A_V$$
 = 10,  $f_{OL}$  = 1 kHz,  $f_{OH}$  = 10 kHz. Assume  $R_F$  = 10 k $\Omega$  ,  $C_1$  =  $C_2$  = 0.1  $\mu F$ 

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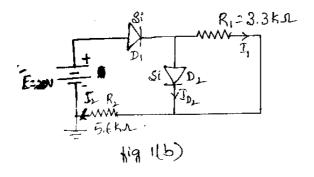
- 6. a. Determine the output voltage of an OP-AMP for input voltage of  $V_{i1}=150~\mu V$  and  $V_{i2}=140~\mu V$ . The amplifier has  $A_d=4000$  and value of CMRR is,
  - i) 100
  - ii)  $10^3$
  - b. Design an inverter summing amplifier for voltage  $V_0 = V_1 + 2 V_2 V_3$ , where  $V_1$ ,  $V_2$  and  $V_3$  are inputs.
  - c. With neat circuit diagram explain the working of voltage controlled voltage source and current controlled current source.

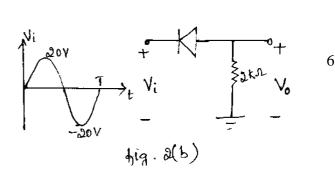
### **UNIT - IV**

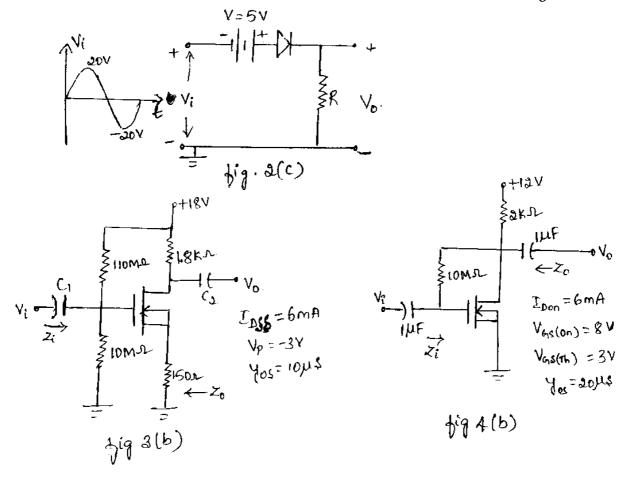
- 7 a. Discuss the architectural differences between  $\mu P$  and  $\mu C$ .
  - b. Compute the following:
    - (i)  $(53.4375)_{10} = ( )_2 = ( )_{16}$
    - (ii)  $(31\text{C.DE})_{16} = ()_2 = ()_{10}$
  - c. Discuss the operation of oscillator circuit and timing of 8051 µC.
- 8 a. With neat diagram explain the operation of any pin of Port 0.
  - b. With bit format of TMOD register, explain each bit.
  - c. Define interrupt and discuss the types and interrupt priorities.

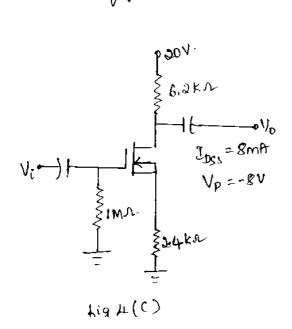
#### UNIT - V

- 9 a. With neat diagram explain each block of basic cellular system.
- b. Explain the basic wireless network topologies.
- c. Discuss the evolution of mobile wireless technologies.
- 10 a. With diagram explain the steps in call handling procedure for mobile to landline.
  - b. Discuss the different services offered by GSM.
  - c. Briefly explain handoff and roaming.









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