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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 consisting of DC source, Diode and resistance which are connected in series. 8
- 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_0 and determine the dc level of output for the network shown in Fig.2.b. Repeat the same when ideal diode is replaced by Si diode. 6
- 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 enhancement type MOSFET. 8
- b. The network of Fig.3.b. has $V_{GSQ} = 0.35$ V and $I_{DQ} = 7.6$ mA
- i) Determine g_m and compare to g_{m0} ii) Find r_d 6
- iii) Sketch the ac equivalent of Fig.3b iv) Find Z_i , 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_v of E-MOSFET voltage divider configuration. 7
- b. The network of Fig.4.b. has $k = 0.24 \times 10^{-3}$ A/V², $V_{GSQ} = 6.4$ V and $I_{DQ} = 2.75$ mA.
- i) Determine g_m and find r_d ii) Find Z_i with and without r_d . 7
- iii) Find Z_0 with and without r_d iv) Find A_v with and without r_d
- c. Determine I_{DQ} , V_{GSQ} 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. 6
- b. Write a neat circuit diagram, and output equation for OP-AMP
- i) Integrator 6
- ii) Differentiator.

- c. Design the bandpass filter for following specification, 8
 $A_V = 10, f_{OL} = 1 \text{ kHz}, f_{OH} = 10 \text{ kHz}$. Assume $R_F = 10 \text{ k}\Omega, C_1 = C_2 = 0.1 \mu\text{F}$
- 6. a. Determine the output voltage of an OP-AMP for input voltage of $V_{i1} = 150 \mu\text{V}$ and $V_{i2} = 140 \mu\text{V}$. The amplifier has $A_d = 4000$ and value of CMRR is, 6
 - 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. 6
- c. With neat circuit diagram explain the working of voltage controlled voltage source and current controlled current source. 8

UNIT - IV

- 7 a. Discuss the architectural differences between μP and μC . 6
- b. Compute the following: 6
 - (i) $(53.4375)_{10} = (\quad)_2 = (\quad)_{16}$
 - (ii) $(31\text{C.DE})_{16} = (\quad)_2 = (\quad)_{10}$
- c. Discuss the operation of oscillator circuit and timing of 8051 μC . 8
- 8 a. With neat diagram explain the operation of any pin of Port 0. 8
- b. With bit format of TMOD register, explain each bit. 6
- c. Define interrupt and discuss the types and interrupt priorities. 6

UNIT - V

- 9 a. With neat diagram explain each block of basic cellular system. 8
- b. Explain the basic wireless network topologies. 6
- c. Discuss the evolution of mobile wireless technologies. 6
- 10 a. With diagram explain the steps in call handling procedure for mobile to landline. 8
- b. Discuss the different services offered by GSM. 6
- c. Briefly explain handoff and roaming.




