U.S.N

P.E.S. College of Engineering, Mandya - 571 401
(An Autonomous Institution affiliated to VTU, Belgaum)
Second Semester, B.E. - Semester End Examination; June – 2016
Electronic Devices and Communication
(Common to All Branches)

Time: 3 hrs   *Max. Marks: 100*

Note: i) Answer **FIVE** full questions, selecting **ONE** full question from each unit.
       ii) Assume missing data suitably.

UNIT - I

1 a. Explain full wave rectification and write the value of V_{dc}.   7

  b. Determine I_D, V_D and V_O for the circuit shown in Fig.1;
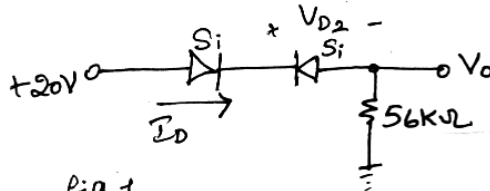

fig 1.

6

  c. For the network shown in Fig.2, determine the range of R_L and I_L that will result in V_{RL} being maintained at 10 V and also determine the maximum wattage rating of the diode.
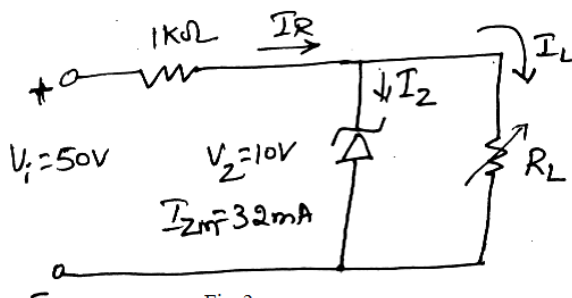

Fig. 2

7

2 a. Explain working principle of photo conductive cells.   6

  b. Determine V_0, I_1, I_{D1} and I_{D2} for the parallel diode configuration shown in Fig.3, E = 10 V
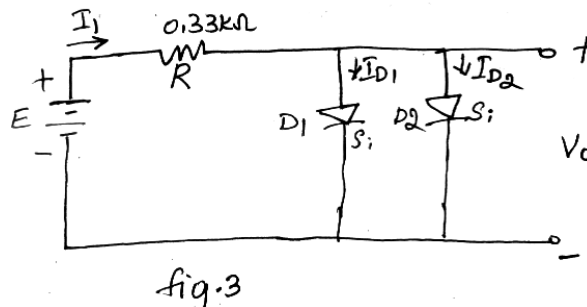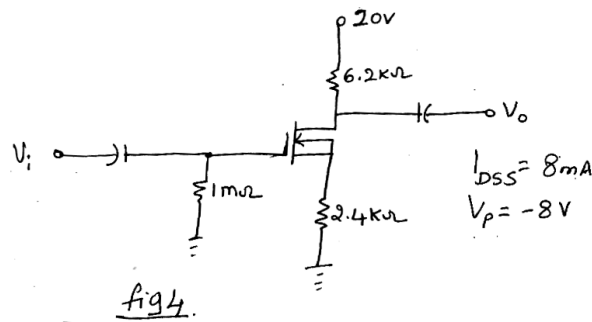

fig.3

6

  c. What are photo diodes? Explain the V-I characteristics of Photodiodes.   8

UNIT - II

3 a. With neat diagram, explain the operation of an N-channel Depletion type MOSFET and write its transfer characteristics.   7

  b. Explain the construction and characteristics of an N-channel MESFET.   6

  c. Explain the I_{DQ}, V_{GSQ} and V_D for the network shown in Fig.4.   7

fig4.

4 a. Explain E-MOSFET ac small-signal model and give the equation for g_m. 7

  b. Write the block diagram of feedback circuit used as an oscillator and explain Barkhausen criterion for oscillation. 6

  c. Describe the ideal phase-shift oscillator and write the practical circuits for FET Version and explain. 7

UNIT - III

5 a. Explain the concept of virtual ground. Sketch the following circuits and explain their operation:
  (i) Non-Inverting amplifier   (ii) Integrator. 8

  b. Explain the following Op-amp specification frequency parameters :
  (i) Gain Band width   (ii) Slew Rate (SR) 7
  (iii) Maximum signal frequency   (iv) Output offset frequency

  c. Determine the output voltage of an Op-amp for input voltages of $V_{i1} = 150$ μV and $V_{i2} = 140$ μV. The amplifier has a differential gain of $A_d = 4000$ and the value of CMRR is: 5
  (i) 100   (ii) 10^5

6 a. Show the connection of an LM124 quad Op-amp as a three-stage amplifier with gain of +10, -18 and -27. Use a 270 kΩ feedback resistor for all three circuits. What output voltage will result for an input of 150 μV? 8

  b. Draw the circuit diagram of voltage controlled voltage source and voltage controlled current source. Derive an expression for output current I_o. 6

  c. Draw the circuit and frequency response of a first order High pass filter and explain its operation. 6

UNIT - IV

7 a. Explain the working of microprocessor with neat block diagram. 6

  b. Write in brief about 8-bit, 16-bit and 32-bit micro controllers. 8

  c. Calculate the equivalent values :
  (i) $(101010111100)_2 = (?)_8 = (?)_{16}$ (ii) $(240)_{10} = (?)_2 = (?)_{BCD}$ 6

8 a. Explain the Internal RAM of 8051. 6

  b. Explain the following : (i) PSW   (ii) Special function Register (SFR). 8

  c. Explain in detail stack and stack pointer. 6

UNIT - V

9 a. Define the following terms :
  (i) Mobile station   (ii) SIM   (iii) MSC 6
  (iv) Hand-off   (v) FDD   (vi) full duplex.

  b. Explain the call establishment procedure for mobile to PSTN. 8

  c. With neat diagram explain the working of basic paging system. 6

10 a. List out the advantages and disadvantages of cellular system. 6

  b. Explain briefly the frequency reuse concept in cellular system. 8

  c. With neat figure explain the GSM reference architecture. 6

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