



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

*(An Autonomous Institution affiliated to VTU, Belgaum)*

**First Semester, B.E. : Make – up Examination; Jan/ Feb-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) Missing data may suitably assume.

**UNIT - I**

1 a. Write the circuit diagram of series diode configuration and explain the procedure for drawing dc load line for the circuit. 6

b. Explain the working of center-tapped transformer full-wave rectifier with necessary circuit diagram and waveforms. 8

c. For the network shown in Fig. Q1(c) compute the currents (i)  $I_1$  (ii)  $I_2$  (iii)  $I_{D2}$

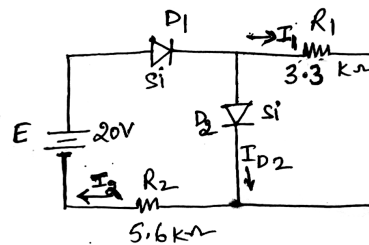


fig Q 1 (c)

2 a. Describe the operation of Half-wave voltage doubler along with related circuit diagrams. 6

b. Sketch and explain the basic biasing arrangement and characteristics of photodiode. 7

c. For the network shown in Fig. Q2(c) with  $C = 1\mu\text{F}$ ,  $R = 100\text{ k}\Omega$ ,  $V = 5\text{ V}$ ,  $f = 1000\text{ Hz}$ , Compute ; i) Output voltage  $V_0$  ii) Sketch the output waveform

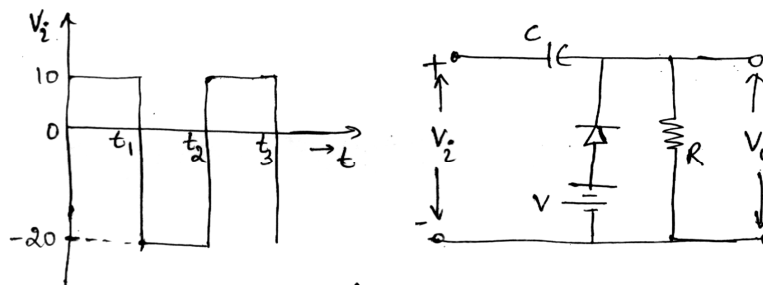


fig Q 2 (c)

**UNIT - II**

3 a. Discuss the basic operation and drain characteristics of N-Channel depletion type MOSFET with related diagrams. 10

b. Explain the construction and working of VMOS, list its advantages. 10

4 a. Analyze the voltage divider biasing arrangement for an N-Channel enhancement MOSFET along with circuit diagram and related equations. 8

- b. Sketch the circuit diagram of FET phase shift oscillator and explain its working. 6
- c. State and explain Barkhausen criterion for Oscillation. 6

### UNIT - III

- 5 a. Write the circuit of OP-AMP inverting amplifier and write the voltage gain equation. If the output voltage of OP-AMP non inverting amplifier is 12 V,  $R_f = 500 \text{ k}\Omega$ ,  $R_1 = 100 \text{ k}\Omega$ . Calculate the required input voltage. 6
- b. Write the circuit diagram of basic differential amplifier and explain its operation as (i) single ended (ii) double ended (iii) common mode. 6
- c. Sketch the OPAMP circuit and write the output voltage equation for (i) Integrator (ii) Differentiator (iii) Voltage follower. 8
6. a. Write the OPAMP circuit and its frequency response for (i) Second order low pass filter (ii) Second order high pass filter. 6
- b. Explain the circuit diagram of OPAMP (i) non inverting voltage controlled voltage source (ii) current controlled current source. 6
- c. Write the OP AMP circuit and output equation (i) Voltage subtractor (ii) 3-input summing amplifier (iii) Constant gain-multiplier. 8

### UNIT - IV

- 7 a. List the major differences between microcontroller and microprocessor. 5
- b. Write short note on (i) 8-bit microcontroller (ii) 16-bit microcontroller. 6
- c. Compute the following conversions :
- (i)  $(47.8125)_{10} = ( )_2 = ( )_{16}$  9
- (ii)  $(8A9.B4)_{16} = ( )_{10} = ( )_2$
- (iii)  $(A3B)_{16} = ( )_2 = ( )_{10}$
- 8 a. Write the block diagram of 8051 microcontroller architecture and list its features. 8
- b. Explain with block diagram, timer mode 1 and timer mode 2 operations. 7
- c. Describe the standard UART data word format. 5

### UNIT - V

- 9 a. Write and explain the block diagram of Basic cellular system. 6
- b. Discuss the concept of frequency division duplexing and time division duplexing. 6
- c. Explain the call handling procedure for mobile to land line with block diagram. 8
- 10 a. Explain the following two types of topologies used in wireless network: 8
- (i) Infrastructure network topology (ii) Ad HOC network topology.
- b. Write the advantages and disadvantages of cellular systems with small cells. 8
- c. Write note on cell concept in cellular system. 4