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# BMS College of Engineering, Bangalore-560019

(Autonomous Institute, Affiliated to VTU, Belgaum)

## January 2017 Semester End Make Up Examinations

Course: Elements of Electronics Engineering  
Course Code: 14EC1ICEEE

Duration: **3 hrs**  
Max Marks: **100**

Date: 17.01.2017

### Instructions:

#### UNIT 1

- 1 a Draw and explain the input and output characteristics of a transistor operated under common emitter configuration. Mark the various regions of operation in the output characteristics. 8
- b Explain the characteristic parameters for a JFET and deduce the relationship between them 6
- c Design a voltage divider bias circuit using silicon transistor with the following specifications:  $V_{CC} = 12\text{V}$ ,  $V_E = 5\text{V}$ ,  $V_{CE} = 3\text{V}$  and  $I_C = 1\text{mA}$ . 6

#### OR

- 2 a Explain the construction and operation of depletion type MOSFET. Draw its characteristics. 8
- b List the differences between BJT and MOSFET 6
- c Given  $I_{DSS} = 6\text{ mA}$  and  $V_P = -4.5\text{ V}$ : (i) Determine  $I_D$  at  $V_{GS} = -2\text{ V}$  and  $V_{GS} = -3.6\text{ V}$  (ii) Determine  $V_{GS}$  at  $I_D = 3\text{ mA}$  and  $I_D = 5.5\text{ mA}$ . 6

#### UNIT 2

- 3 a With a neat block diagram, explain the various feedback topologies 6
- b With a neat circuit diagram and equivalent circuit, explain the  $r_e$  model for a CE amplifier using voltage divider bias. 10
- c List the advantages of negative feedback in amplifiers 4

#### OR

- 4 a Explain the classification of amplifiers. 8
- b Compare CB, CE and CC transistor configurations 6

- c Calculate the gain, input, and output impedances of a voltage-series feedback amplifier having  $A = -300$ ,  $R_i = 1.5 \text{ k}\Omega$ ,  $R_o = 50 \text{ k}\Omega$ , and  $\beta = -0.0667$  6

### UNIT 3

- 5 a List the characteristics of ideal and practical op-amp 6  
 b With a neat circuit diagram, explain the operation of Hartley oscillator. 6  
 c Show how op-amp can be used as (i) Integrator (ii) Differentiator 8

### UNIT 4

- 6 a State and explain DeMorgan's theorem 4  
 b Realize X-OR gate using NAND and NOR gates 6  
 c (i) Subtract (i)  $[27]_{10} - [68]_{10}$  using 1's complement technique 6  
 (ii) Subtract  $[11101.111]_2$  from  $[11111.101]_2$  using 2's complement technique  
 d Explain the classification of memory devices. 4

### UNIT 5

- 7 a With a neat block diagram, explain the principle of operation of RADAR. 8  
 b Mention the advantages of digital communication systems 6  
 c Briefly explain the concept of Internet Of Things (IOT) 6

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