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BMS College of Engineering, Bangalore-560019

(Autonomous Institute, Affiliated to VTU, Belgaum)

December 2016 Semester End Main Examinations

Course: Elements of Electronics Engineering
Course Code: 14EC1ICEEE

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

Date: 21.12.2016

Instructions: Answer any Five full questions choosing one from each unit

UNIT 1

- 1 a Explain the principle of operation of PNP transistor with necessary equations . 6
- b Define Q point. Explain how the position of Q point determines the maximum collector emitter voltage swing. 8
- c Design a voltage divider bias circuit to have a Q point at (5V,5mA),when the supply is 15V.Use a transistor with $h_{fe}=100$. 6

OR

- 2 a Draw the N-channel JFET and explain its operation with the help of its characteristics in detail. 8
- b List and explain the differences between BJT and FET 4
- c With a neat circuit diagram,explain the operation of E-MOSFET 4
- d Calculate the transconductance of JFET having the following parameters. 4
 $I_{DSS}=12\text{mA}$, $V_p = -4\text{V}$, at bias points 1) $V_{GS}=0\text{V}$ 2) $V_{GS} = -1.5\text{V}$

UNIT 2

- 3 a Explain the operation of BJT as a linear amplifier. 6
- b Compare various characteristics of CE, CB and CC amplifiers. 6
- c Explain DC and AC analysis of CE Amplifier` 8

OR

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| 4 | a Explain the concept of feedback and Obtain the expression for the gain of a closed loop system. List the various negative feedback topologies. | 10 |
| | b Explain the frequency response of BJT amplifier. | 5 |
| | c Calculate the gain, input and output impedances of a voltage series feedback amplifier having $A=-400$, $R_i=1.5k\Omega$, $R_o=100k\Omega$ and $\beta=-0.0667$ | 5 |

UNIT 3

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| 5 | a With a neat block diagram, explain working of an OP-Amp. | 5 |
| | b State Barkhausen Criterion for sustained Oscillations and With the neat circuit diagram and relevant expressions, explain the operation of RC phase shift oscillator. | 10 |
| | c Explain the operation of a OP-AMP as a differentiator and derive the expression for output voltage. | 5 |

UNIT 4

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| 6 | a Realize all basic gates using NOR gate. | 4 |
| | b Convert the following: i) $(0.625)_8 = (?)_{10}$ ii) $(9B2)_H = (?)_{10}$
iii) $(35.45)_{10} = (?)_8$ iv) $(8A9.B4)_H = (?)_2$ | 8 |
| | c Subtract the following using 2's complement method,
i) $(11010)_2$ from $(11101)_2$
ii) Subtract $(11101)_2$ from $(11010)_2$ | 5 |
| | d Explain PSWR in a microprocessor. | 3 |

UNIT 5

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| 7 | a Explain the principle of working of LED. | 5 |
| | b Draw and explain block diagram of communication system | 8 |
| | c Explain the principle of RADAR with block diagram. | 7 |
