Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

**Supplementary Examination – June – 2017**

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| **Code :** | **14EC2012** | **Duration :** | **3hrs** |
| **Sub. Name :** | **PULSE AND WAVE SHAPING CIRCUITS** | **Max. marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| Q. No. | Sub Div. | Questions | Course  Outcome | Marks |
| 1. | a. | Making use of Laplace transform approach, show that the response of the RC low pass filter to a ramp input is given by Vo(t)=αRC(1-e-t/RC) | CO1 | 15 |
| b. | For a low pass RC circuit, it is desired to pass a ramp signal whose sweep is 2msec with 0.5% transmission error. Determine the upper 3dB frequency. | CO1 | 5 |
| (OR) | | | | |
| 2. | a. | Identify a linear waveshaping circuit which generates spike waveform when the time constant of the circuit(RC) is lesser than time period of the input signal(T). With neat circuit diagram, explain the operation of that circuit and derive the ouput voltage expression. | CO1 | 15 |
| b. | Describe the physical behaviour of a high-pass filter. Specify the reason for terming the coupling capacitor C in the RC high-pass filter as a blocking capacitor. | CO1 | 5 |
| 3. | a. | Sketch and describe the operation of the following clipping circuits.  i)Series positive clipper with bias  ii)Parallel positive clipper with bias | CO1 | 15 |
|  | b. | Sketch the output waveform of the following clipper circuit. | CO1 | 5 |
| (OR) | | | | |
| 4. | a. | Sketch and describe the operation of the following clamping circuits.  i)Negative Clamper  ii)Positive Clamper | CO1 | 15 |
|  | b. | Prove the clamping circuit theorem mathematically. | CO1 | 5 |
| 5. | a. | Calculate the stable state currents and voltages for the fixed bias bistablemultivibratorcircuit which uses npn silicon transistors. The component values of the circuit are Vcc= +10 V, -VBB = -2V, R1=4.7 KΩ, R2 =6.8 KΩ, RC =0.82 KΩ. Assume VCE(sat) =0.25V and VBE(sat) =0.87 V. | CO2 | 15 |
|  | b. | Write short notes on triggering methods used in bistablemultivibrator. | CO2 | 5 |
| (OR) | | | | |
| 6. | a. | Discuss the operation of Emitter coupled binary with neat circuit diagram and explain how it is used as a sine to square wave converter. | CO2 | 15 |
|  | b. | Derive the expression for the gate width of a collector coupled monostable multivibrator when the transistor Q2 is in saturation. | CO2 | 5 |
| 7. | a. | Explain the operation of free running multivibrator with neat circuit diagram and waveforms. | CO2 | 15 |
|  | b. | A collector-coupled astable multivibrator using two npn Si transistors operating at a frequency of 10KHz. Calculate the value of capacitor if R1=59KΩ and R2=36KΩ. | CO2 | 5 |
| (OR) | | | | |
| 8. | a. | Sketch neatly the circuit diagram used to generate exponential sweep waveform and derive the mathematical relationship between slope error, displacement error and the transmission error for an exponential waveform. | CO2 | 15 |
|  | b. | In a simple exponential sweep generator, the time constant of the circuit is 1000μsec and the sweep duration is 100μsec, find the slope error, displacement error and transmission error. | CO2 | 5 |
|  | | **Compulsory:** |  |  |
| 9. | a. | Illustrate bootstrap sweep circuit and obtain the expression for slope error. | CO2 | 15 |
|  | b. | Distinguish between pulse transformer and conventional transformer. List the applications of blocking oscillator. | CO2 | 5 |

ALL THE BEST