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**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

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

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

**End Semester Examination – Nov/Dec - 2016**

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|  |  | **Semester :** | **2016-17 ODD** |
| **Code :** | **12EC207** | **Duration :** | **3 hrs** |
| **Sub. Name :** | **Solid State Circuits** | **Max. marks :** | **100** |

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| **Q. No.** | | **Questions** | **Marks** |
| **PART-A (10X1=10 MARKS)** | | | |
| 1. | What is the maximum efficiency of half wave rectifier?   1. 41.6% (b) 40.6% (c) 42.6% (d) 43.6% | | (1) |
| 2. | Define Peak Inverse Voltage. | | (1) |
| 3. | Transistor can be used as a switch in digital circuits. [True/False] | | (1) |
| 4. | The Stability factor for fixed bias circuit is   1. 1-β (b) 1+β (c) 1/β (d)β | | (1) |
| 5. | If G1, G2 and G3 are the individual voltage gains of a three stage amplifier, then total voltage gain G = \_\_\_\_\_\_\_\_. | | (1) |
| 6. | What is the maximum efficiency of Class B amplifier? | | (1) |
| 7. | Mention the two types of feedback? | | (1) |
| 8. | A feedback amplifier has an open loop gain of 600 and feedback factor β=0.01. Find the closed loop gain with negative feedback. | | (1) |
| 9. | State Barkhausen criterion. | | (1) |
| 10. | What are the types of tuned amplifiers? | | (1) |

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| **PART B (5 X 3= 15 MARKS)** | | |
| 11 | Compare Rectifiers and Regulators | (3) |
| 12 | For the fixed bias circuit of BJT determine (a) collector current (b) collector resistance (c) base resistance. Assume β=80, VBE=0.7V, VCC=12V, IB=40µA and VCE=6V. | (3) |
| 13 | Mention the three coupling schemes used in multistage amplifier. | (3) |
| 14 | Determine voltage gain, input impedance and output impedance with feedback for voltage shunt feedback having A = -100, Ri = 10 k, Ro = 20 k,- 0.1. | (3) |
| 15 | Draw the Electrical equivalent circuit of a crystal and state its property. | (3) |

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| **PART C (5 X 15= 75 MARKS)** | | | |
| 16. |  | With neat circuit diagram and necessary waveforms describe the operation of a full wave rectifier and derive the value for ripple factor and rectifier efficiency. | (15) |
| (OR) | | | |
| 17. |  | Consider a Zener regulator circuit, where Vs=45V, Rs=1kΩ and D is an ideal zener  diode with Vz=10V and maximum current rating IZmax=30mA.   1. Determine the range of RL and IL that will result in VL being maintained at 10V. 2. Determine the maximum power rating of the zener diode as voltage regulator. 3. If the diode is not ideal and has a dynamic resistance of 20Ω, Calculate zener current and the load current in the circuit for RL=1kΩ. | (15) |
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| 18. |  | With neat circuit diagram, analyze the Fixed bias circuit of BJT and discuss how network parameters define the possible range of Q-point and derive an expression for its stability factor. | (15) |
| (OR) P.T.O | | | |
| 19. | a | Discuss about the self-biasing circuit of FET with neat circuit diagram. | (7) |
|  | b | Determine the following for the FET self-bias network VDS, VS, VG, VD with the following specifications. [VDD=20 V, RD=3.3 kΩ, RS=1 kΩ, RG=1 MΩ, IDSS=8 mA, VP = -6 V,ID= 2.6mA,] | (8) |
| 20. |  | Draw the circuit diagram of RC coupled amplifier and explain its working with frequency response. | (15) |
| (OR) | | | |
| 21. |  | With the help of a circuit diagram briefly explain the operation of a class B amplifier and derive its efficiency. | (15) |
| 22. |  | Describe the single-ended and double ended operation of differential amplifier using BJT with neat circuit diagram. | (15) |
| (OR) | | | |
| 23. |  | With a neat block diagram explain about voltage shunt feedback and voltage series feedback and derive its voltage gain, input impedance and output impedance. | (15) |
| 24. |  | With circuit diagram, explain in detail, the operation of a double tuned amplifier. | (15) |
| (OR) | | | |
| 25. |  | With neat circuit diagram explain the operation of Hartley oscillator and derive its frequency of oscillation. | (15) |

ALL THE BEST