B.E.(with Credits)-Regular-Semester 2012-Instrumentation Engineering Sem III IN 302 - Electronic Devices and Circuits

| P. F Tin | Pages : ne : Th | 2 $\mathbf{GUG/W/16/377}$ ree Hours* $_{3 6 2 4 *}$ Max. Marks : 8 | GUG/W/16/3779 Max. Marks : 80 | |
|-------------|--------------------|---|----------------------------------|--|
| | Note | Same answer book must be used for each question. All questions carry as indicated marks. Due credit will be given to neatness and adequate dimensions. Assume suitable data wherever necessary. Illustrate your answer wherever necessary with the help of neat sketches. | _ | |
| 1. | a) | Draw the V-I characteristics of Zener diode & explain its operation. | 8 | |
| | b) | A half wave rectifier, having a resistive load of 1000 Ω, rectifier an alternating voltage of 325 V peak value & the diode has a forward resistance of 100 Ω. Calculate i) Peak, average & rms value of current ii) D. C. power O/P iii) A.C. I/P power iv) Efficiency of rectifier | 8 | |
| | | OR | | |
| 2. | a) | Derive expressions for rectification efficiency, ripple factor, TUF and form factor of full wave rectifier with resistive load. | 8 | |
| | b) | Describe the operation of biased clipper & combination clipper. | 8 | |
| 3. | a) | Describe, why does the CE configuration provide large current amplification while the CB configuration does not? | 8 | |
| | b) | An NPN transistor if B=50 is used in common emitter circuit with Vcc=10V & Rc=2K Ω . The bias is obtained by connecting 100 K Ω resister from collector to base. Find the quiescent point & stability factor. | 8 | |
| | | OR | | |
| 4. | a) | What is the need for biasing a transistor? Explain different methods of transistor biasing. | 8 | |
| | b) | What is thermal runway? How can it be avoided? Explain. | 8 | |
| 5. | a) | Describe a small signal low-frequency model of FET with its various elements. | 8 | |
| | b) | A self-biased P-channel JFET has a pinch off voltage =5V & I_{DSS} = 12 mA. The supply voltage available is 12 V. Determine the values of resistors R_D & R_S , so that I_D = 5 mA & V_{DS} = 6 V. | 8 | |
| | | OR | | |
| 6. | a) | What are the biasing schemes available to achieve the required bias in a junction FET? Explain any one of the biasing schemes. | 8 | |
| | b) | Write note on MOSFET. | 8 | |

| 7. | a) | Draw the circuit diagram of class AB amplifier & explain its working. | 8 |
|-----|----|---|---|
| | b) | With the help of suitable circuit diagram, derive an expression of the efficiency of the class C amplifier. | 8 |
| | | OR | |
| 8. | a) | Discuss the method of evaluation of total harmonic distortion, | 8 |
| | b) | What is crossover distortion? Explain. | 8 |
| 9. | a) | What do you understand by feedback in amplifier? Explain the term feedback factor & open loop gain. | 8 |
| | b) | A crystal has the following parameters $L = 0.5$ H, $C_S = 0.06$ P ^F , $C_P = 1$ p ^F & R = 5k Ω Find the series & parallel resonant frequencies & Q- factor of the Crystal. | 8 |
| | | OR | |
| 10. | a) | Describe the Construction of phase shift oscillator & explain its working. | 8 |

b) What are the different types of negative feedback? Explain how the I/P of O/P impedances **8** of an amplifier are affected by the different types of negative feedback.
