

Government College of Engineering, Aurangabad
(An Autonomous Institute of Government of Maharashtra)

F.E. (ECT) Examination

End semester Examination Nov-Dec 2016

ET 1001: Basics of Electronics Engineering

Time: Three Hours

5 DEC 2016

Max. Marks: 60

“Verify the course code and check whether you have got the correct question paper”

N.B.:-

1. All Questions are compulsory
2. Figures to the right indicates full marks
3. Assume suitable data if necessary and state it clearly
4. Use of non-programmable calculator is allowed

I Choose the correct answer from the following:

06

1. In reverse bias the diode can be represented as-
(a) Open Circuit (b) Short Circuit (c) A current source with constant current (d) None of these.
2. It is the current gain for common base configuration.
(a) α (b) β (c) γ (d) σ
3. What occurs in PN junction diodes when the electric field in the depletion layer increases to the point where it can break covalent bonds and generate electron hole pairs?
(a) Covalent breakdown (b) Diffusion (c) Zener breakdown (d) Avalanche effect
4. Photoconductive effect means-
(a) The conversion of photonic energy to electromagnetic energy.
(b) The conversion of electromagnetic energy to photonic energy.
(c) The decreased conductivity of an illuminated semiconductor junction.
(d) The increased conductivity of an illuminated semiconductor junction.
5. A triac can pass a portion of _____ half cycle through the load.
(a) Only positive (b) Only negative
(c) Both positive & negative (d) Neither positive nor negative
6. FM is disadvantageous over AM signal because-
(a) Much wider channel bandwidth is required.
(b) FM systems are more complex and costlier.
(c) Adjacent channel interference is more.
(d) Both a and b.

II Attempt any THREE questions

12

1. Differentiate PN Junction Diode and Zener Diode.
2. The reverse saturation current of a silicon PN-junction diode is $20\mu\text{A}$ at the temperature 300K . Determine forward-bias voltage to be applied across the PN-junction to obtain a current of about 150mA .
3. Draw NPN and PNP transistors symbols. Label all the currents and show the direction of flow. Explain working of NPN transistor.
4. Define following terms related to SCR-
(a) Holding Current (b) Latching Current (c) Breakover Voltage
(d) Circuit fusing Rating

P.T.O

III Attempt any THREE questions

12

1. What are the requirements of transducers? (Any 4 points)
2. Write a short note on Photo Multiplier Tube.
3. Derive mathematical expression of modulation index for Frequency Modulated Wave?
4. Draw waveform of AM modulated wave. A sinusoidal carrier wave of frequency 2MHz and amplitude 20mV is amplitude modulated by a sinusoidal wave of frequency 5kHz. Determine the frequency and amplitude of side bands. Consider modulation index as 0.8.

IV Attempt any TWO questions

10

1. Describe working of SCR as full wave rectifier. Also derive expression of V_{DC} for it.
2. Explain working of Zener diode as a regulator with a varying load.
3. A half wave rectifier circuit has an rms supply voltage 230V and the load resistance is 500Ω . The forward resistance of the diode is 15Ω . Determine the dc output voltage, dc load current, dc power delivered to the load. Compare Half wave Rectifier and center tapped full wave rectifier with diode (Any 4 points).

V Attempt any TWO questions

10

1. How to measure amplitude, frequency of a waveform using CRO? Explain how phase difference between two waveforms can be obtained both in normal mode as well as in XY mode using CRO?
2. Write a short note on satellite transponders.
3. Explain Square Law Modulator for generation of AM Wave.

VI Attempt any TWO questions

10

1. With suitable block diagram explain Monochrome TV transmitter.
2. What is interlaced scanning? What is the use of blanking pulses and Sync pulses? Which type of television standard was adopted in India?
3. Write a short note on HDTV.

BEST OF LUCK!!!
