

B.TECH. (CSE/EEE) - 1ST SEMESTER EXAMINATIONS; DEC.-2017
(SUBJECT: FUNDAMENTAL OF ELECTRONICS; PAPER CODE – 13020114/13160112)

Time: 03:00 Hrs.

Max Mark: 50

Instructions:

1. Write your Roll No. on the Question Paper.
2. Candidate should ensure that they have been provided with the correct question paper. Complaints in this regards, If any, should be made within 15 minutes of the commencement of the exam. No complaint(s) will be entertained thereafter.
3. Each Part is Compulsory. Marks are indicated against each question.
4. Draw the diagram wherever required.

PART-A (OBJECTIVE TYPE QUESTIONS OMR SHEETS)

ATTEMPT ALL QUESTIONS:-

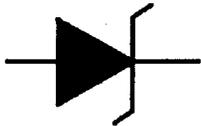
Q1. For Silicon, the energy gap at 300 K is:- (1)

- a) 1.1 J b) 1.1 W c) 1.1 eV d) 1.1 VS^{-1}

Q2. The diode whose capacitance can be changed by varying the reverse bias is called:- (1)

- a) Varactor diode b) Tunnel diode c) Zener diode d) Schottky diode

Q3. Identify the symbol:- (1)



- a) Varactor diode b) Tunnel diode c) Zener diode d) Schottky diode

Q4. The knee voltage in a Silicon p-n junction diode is of the order of:- (1)

- a) 1.7 V b) 0.7 V c) 2.0 V d) 2.5 V

Q5. Which state is forbidden in an S-R flip flop:- (1)

- a) $S = 1, R = 0$ b) $S = 0, R = 1$ c) $S = R = 0$ d) $S = R = 1$

Q6. When does a J-K flip flop operate in toggle mode:- (1)

- a) $J = K = 1$ b) $J = K = 0$ c) $J = 0, K = 1$ d) $S = R = 1$

Q7. The semiconductor which has more electrons than holes after doping is:- (1)

- a) n-type b) p-type c) forward biased d) reverse biased

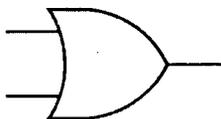
Q8. A semiconductor generally has valence electrons:- (1)

- a) 3 b) 4 c) 5 d) 6

Q9. The negative resistance region in the I-V characteristics of a tunnel diode is obtained when:- (1)

- a) both N & P regions are heavily doped b) N region has higher doping than P region
c) P region has higher doping than N region d) an intrinsic silicon is between N & P regions

Q10. Identify the symbol:- (1)



- a) OR Gate b) AND Gate c) NOR gate d) NAND Gate

- Q11. The Boolean expression of a NOR gate is:- (1)
- a) $X = A + B$ b) $X = \bar{A} + B$ c) $X = A + \bar{B}$ d) $X = \bar{A} + \bar{B}$
- Q12. Which of the following is an expression based on DeMorgan's theorem:- (1)
- a) $A \cdot 1 = 1$ b) $A + 0 = 0$ c) $\overline{A + B} = \bar{A} \cdot \bar{B}$ d) $\overline{A + B} = \bar{A} + \bar{B}$
- Q13. The Boolean expression $A \cdot (B + C) = A \cdot B + A \cdot C$ represents which Boolean law:- (1)
- a) Associative b) Distributive c) Absorptive d) Commutative
- Q14. Which of the following is a Universal gate:- (1)
- a) OR gate b) NAND gate c) NOT gate d) AND gate Casting
- Q15. In an oscilloscope screen, linear sweep is applied at the:- (1)
- a) origin b) vertical axis c) horizontal axis d) both (b) and (c)
- Q16. In a CRT, the location of the electron beam on the screen is controlled by:- (1)
- a) electron gun b) fluorescent screen c) deflection plates d) anode grid
- Q17. The secondary electrons emitted by the screen of a CRO are collected by:- (1)
- a) Anode b) Aquadag c) signal generator d) storage element
- Q18. Lissajous pattern in a CRO measures:- (1)
- a) voltage b) phase c) frequency d) both (b) and (c)
- Q19. To display a signal pattern on the screen a wave is applied to the plates of the CRO:- (1)
- a) square b) sawtooth c) sinusoidal d) rectangular
- Q20. An ideal ammeter should have resistance:- (1)
- a) zero b) infinite c) low d) high
- Q21. A voltmeter is connected in with the component whose voltage is to be measured:- (1)
- a) series b) parallel c) isolation d) centre
- Q22. The sensitivity of a multi-meter is expressed in:- (1)
- a) Ohms b) Amperes c) Ohms/Volt d) Volts
- Q23. A cosine wave is an example of which type of signal:- (1)
- a) Even b) Odd c) aperiodic d) random
- Q24. The unit function whose value is infinity at the origin and zero elsewhere is called:- (1)
- a) unit step b) unit ramp c) unit impulse d) none of these
- Q25. Noise in an electronic circuit is an example of which type of signal:- (1)
- a) Random b) Deterministic c) Aperiodic d) both (a) and (c)

PART-B (DESCRIPTIVE TYPE)

SHORT ANSWER TYPE QUESTIONS:-

Attempt any five questions from given seven questions:

- Q1. Describe how a depletion region is formed in a P-N junction diode. (3)
- Q2. Differentiate between Analog and Digital Multimeter. (3)
- Q3. Describe the working and features of a function generator. (3)
- Q4. Using a suitable diagram, explain the working of a photodiode. (3)

Q5. Describe the process of Zener breakdown. (3)

Q6. Differentiate between a NOR gate and a NAND gate. (3)

LONG ANSWER TYPE QUESTIONS

Attempt any two out of three questions:

Q7. Explain the construction and working of a Cathode Ray Tube (CRT). (5)

Q8. Describe the construction and working of an electronic voltmeter. (5)

Q9. Using a suitable block diagram, explain the working of a communication system. (5)
