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(1st Semester)

BACHELOR OF COMPUTER APPLICATIONS

Paper : BEL : 105 (Old Course)

(Basic Electronics)

Full Marks : 70

Pass Marks : 45%

Time : 3 hours

(PART : B—DESCRIPTIVE)

(Marks : 45)

*The figures in the margin indicate full marks
for the questions*

1. (a) What is a resistor? Write its application.
A 3-V potential difference is applied
across a 6Ω resistor. What is the
current that flows into the resistor? 5
- (b) What is capacitor? List the different
types of capacitor. 2
- (c) List out the different types of
transformer. 2

Or

- (d) What is atomic theory? Write the atomic structure of silicon and germanium. 4
- (e) Explain the energy band diagram of the following : 5
- (i) Insulator
 - (ii) Conductor
 - (iii) Semiconductor
2. (a) What is Zener diode? Explain the two types of break down in Zener diode with neat diagram ($V-I$ characteristics). 5
- (b) What is LDR? Explain the construction and working principle of LDR. 4

Or

- (c) What is bridge rectifier? Draw the circuit diagram, output waveform and explain the working principle of bridge rectifier. List out the different applications of bridge rectifier. 9
3. (a) What are PNP and NPN transistors? Explain the construction and modes of operation. 5
- (b) Write notes on the following : 4
- (i) Fixed bias
 - (ii) Collector-base bias
 - (iii) Emitter bias

Or

- (c) Explain the construction and working of JFET. 4
- (d) What is MOSFET? Explain the working of E-MOSFET and D-MOSFET. 5
4. (a) With a neat circuit diagram, explain transformer coupled class A power amplifier. 5
- (b) With a neat circuit diagram, explain push-pull amplifier. 4

Or

- (c) With a neat circuit diagram, explain R-C coupled transistor amplifier. 6
- (d) Explain positive and negative feedback amplifier. 3
5. (a) Explain the working of Hartley oscillator with a neat diagram. 6
- (b) List out the classification of oscillator. 3

Or

- (c) Draw the circuit diagram of Colpitts oscillator. 6
- (d) List out the difference between rectifiers, amplifiers and oscillators. 3

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(1st Semester)

BACHELOR OF COMPUTER APPLICATIONS

Paper : BEL : 105 (Old Course)

(**Basic Electronics**)

(PART : A—OBJECTIVE)

(Marks : 25)

The figures in the margin indicate full marks for the questions

1. Put a Tick (✓) mark against the correct answer in the brackets provided : 1×10=10

(a) A semiconductor is formed by _____ bonds.

- (i) very small energy ()
- (ii) least energy ()
- (iii) maximum energy ()
- (iv) None of the above ()

(b) A Zener diode is always_____connected.

(i) forward ()

(ii) reverse ()

(iii) Both (i) and (ii) ()

(iv) None of the above ()

(c) A semiconductor is formed by _____ bonds.

(i) covalent ()

(ii) coordinate ()

(iii) electrovalent ()

(iv) All of the above ()

(d) A bridge rectifier consists of

(i) one diode ()

(ii) two diodes ()

(iii) three diodes ()

(iv) four diodes ()

(e) In $p-n-p$ transistor, _____ are the minority carriers.

(i) electrons ()

(ii) holes ()

(iii) donor ions ()

(iv) acceptor ions ()

(f) How many junctions are there in BJT?

(i) One ()

(ii) Two ()

(iii) Three ()

(iv) Four ()

(g) The material used for constructing LED is

(i) GaAs ()

(ii) GaAsP ()

(iii) Both (i) and (ii) ()

(iv) None of the above ()

(h) Application of LED is

- (i) automotive heat lamps ()
- (ii) digital watches ()
- (iii) burglar alarm systems ()
- (iv) All of the above ()

(i) An oscillator produces

- (i) damped oscillation ()
- (ii) undamped oscillation ()
- (iii) modulated oscillation ()
- (iv) None of the above ()

(j) E-MOSFET is also called normally as

- (i) on MOSFET ()
- (ii) off MOSFET ()
- (iii) high MOSFET ()
- (iv) zero MOSFET ()

2. State whether the following statements are *True (T)* or *False (F)* by putting a Tick (✓) mark : 1×5=5

(a) JFET is used as a buffer amplifier.

(T / F)

(b) LDRs are used to measure the intensity of light.

(T / F)

(c) An amplifier is an electronic device that decreases the voltage, current or power of a signal.

(T / F)

(d) A transistor is a semiconductor device used to amplify or switch electronic signals and electrical power.

(T / F)

(e) BJT is a bipolar device.

(T / F)

3. Answer the following questions in short :

2×5=10

(a) State Ohm's law.

(b) What is rectifier?

(c) Define CB and CE configuration.

(d) What are oscillators?

(e) List out the classification of power amplifier.

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