

## BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

(Theory : 4(a &amp; b))

Full Marks : 80

Time : 3 hours

Answer any **five** questions including **Q. Nos. 1 & 2***Figures in the right-hand margin indicate marks*

1. Answer *all* questions : 2 × 10
  - (a) State ohms law.
  - (b) Define amplitude.
  - (c) Name the three torque required for the proper operation of indicating instrument.
  - (d) Define Energy.
  - (e) What is the effect of power in series ?
  - (f) What is Rectifier ?
  - (g) What is Transducer ?
  - (h) What is Transistor ?
  - (i) State any two advantages of Integrated Circuit.
  - (j) What is Zener Diode ?
  
2. Answer *all* questions : 5 × 6
  - (a) Explain working principle of single phase CE amplifier.
  - (b) Explain working principle of *PN* junction diode.
  - (c) Explain working principle of CRO with simple block diagram.
  - (d) Draw a single line diagram of household electrical showing all the important component in the system.
  - (e) Explain the types and uses of Single Phase induction motor.
  - (f) Draw a block diagram of nuclear power plant.
  
3. (a) Explain working principle of multimeter with block diagram. 5  
(b) What are the main parts of D.C. machine. 5
  
4. (a) Explain the working principle of oscillator with block diagram. 5  
(b) Explain the principle of Fluroscnt Lamp. 5
  
5. (a) Explain the different types of biasing with circuit diagram. 5  
(b) Explain different uses of PMMC types of instrument. 5
  
6. (a) Describe the difference between intrinsic and extrinsic semiconductor. 5

( 2 )

- (b) Explain the difference between A.C and D.C. 5
7. (a) Explain the working of D.C power supply system with the help of block diagram. 5
- (b) A consumer uses
- (i) 4 nos of bulb of 100 W each for 6 hours per day
  - (ii) 4 nos of fans of 60 W each 8 hours per day
  - (iii) 1 H.P motor for 2 hours per day
- Calculate the electricity bill for the month of April 2019 if cost per unit is Rs. 2.50. 5

**II/SEM/COMMON/2019(S)NEW**  
**BASIC ELECTRICAL AND ELECTRONICS ENGINEERING.(NEW SYLLABUS)**  
**(Theory-4 a&b))**

TIME:3 Hrs.

F.M-80

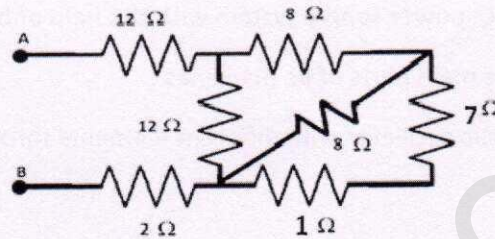
(ANSWER ANY FIVE INCLUDING Q.NO-1 AND Q.NO-2)

Figures in the right hand margin indicate marks.

**Q-1 (ANSWER ALL)**

(2×10=20)

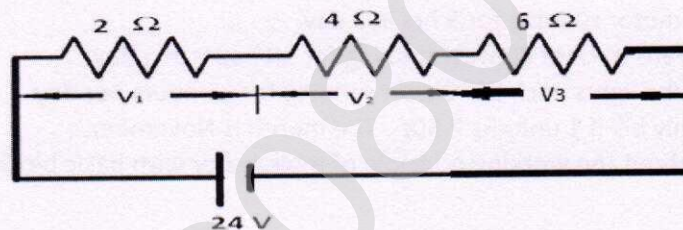
(a) Find the equivalent resistance of the network between A & B of the following circuit.



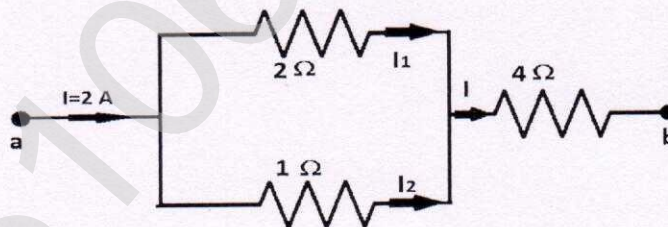
(b) State Ohm's law.

(c) State KCL & KVL.

(d) Find  $V_1$ ,  $V_2$  and  $V_3$  in the circuit.



(e) Find the currents  $I_1$  &  $I_2$  in the above circuit.



(f) Write down two advantages of integrated circuits.

(g) Define filter.

(h) Define transducer.

(i) Define modulation.

(j) Write down the working principle of photovoltaic transducer.

**Q-2 (ANSWER ALL)**

(5×6=30)

(a) Give a brief classification of dc generator on the basis of field excitation.

(b) A resistance of 20 ohm, inductance of 0.2 H and capacitance of 150  $\mu$ F are connected in series and are fed by a 230 volt, 50 Hz supply. Find  $X_L$ ,  $X_C$ , Z, Y, P.F, active power and reactive power.

(c) Explain briefly about ac through pure resistance with phasor diagram.

(d) Write down the difference between vacuum tube and semiconductor.

- (e) Define transistor. State different types of transistor configuration. Write down the output and input current gain relationship in CE, CB and CC configuration.
- (f) Write down the difference between modulation and demodulation.

- Q-3** (a) Explain about the hydro power plant with a neat block diagram. (5)
- (b) Give a brief classification of material according to electrical conductivity with respect to energy band diagram. (5)
- Q-4** (a) Briefly explain the types of wiring for domestic installations. (5)
- (b) State the working of D.C. power supply system with the help of block diagram. (5)
- Q-5** (a) Explain briefly about the main parts of dc machines. (5)
- (b) State the working of basic oscillator with different elements through simple block diagram. (5)
- Q-6** (a) Write down the different uses of PMMC types of instruments. (5)
- (b) State different types of transducers. Explain briefly about active and passive transducer. (5)
- Q-7** (a) A building has the following electrical appliances (5)
- (i) A 1HP motor running for 5 hrs in a day.
- (ii) Three fans each of 80 watt running for 10 hours in a day.
- (iii) Four tube lights each of 40 watt running for 15 hours per day.
- Find the monthly bill if 1 unit=Rs.2.50/-. The month is November.
- (b) Explain briefly about the working principle of multimeter with basic block diagram. (5)

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## II- SEM COMMON/2019(W)

### TH-4(AB) BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

Full Marks: 80

Time : 3 Hours

Answer any FIVE Questions including Q No. 1 & 2

Figures in the right hand margin indicates marks

1.	Answer ALL the Questions :	2x10
(a)	What is series and parallel electrical circuit?	
(b)	What is alternating current?	
(c)	What is Form Factor?	
(d)	State two characteristics and applications of dc series motor?	
(e)	Name the coils in single phase wattmeter. How they will connect with the circuit during measurement of electrical power?	
(f)	What is dopping?	
(g)	Define modulation and name different types.	
(h)	Name different types of electronic emission in electronics engineering.	
(i)	What is DMM and where it is used?	
(j)	Differentiate active and passive transducers. Give one example of each.	
2.	Answer any SIX Questions:	6x5
(a)	What are the different types of torque acting on an indicating type electrical measuring instrument?	
(b)	Name different types of DC motor and state their application.	
(c)	Explain the different types of electrical power in Ac circuit.	
(d)	What are the types of filter circuit? Explain the action of a series inductor filter in the full wave rectifier.	
(e)	Explain the working of zener diode with neat diagram. state its use.	
(f)	Describe conductor, Semiconductor, insulator with respect to energy band diagram.	
3.	Draw the block diagram and explain briefly about thermal power plant.	
4.(a)	A resistance of 1 ohm inductance of 0.1 H and capacitance of 50 MFD connected in series across 230V, 50HZ supply. Determine (a) Inductive reactance (b) Capacitive reactance (c) Impedance (d) current (e) Power factor and active power.	10 10
(b)	Why modulation is needed ?	
5.	A residential building has the following electrical loads. (a) 6 numbers of 40 wt. tube light each running 8 hours/day. (b) 5 numbers of ceiling fans of 60 wt. each running 4 hours/day. (c) An immersion heater of 500 wt. running 2 hours/day. (d) One 0.5 hp motor running 2 hours/day. If the rate of electricity is Rs. 1.40 per unit. Find out the total expenditure towards energy in the month of May.	10
6.	Explain the working principle of Bridge rectifier with a neat circuit diagram and give their merits and demerits.	10
7.	Describe the working principle of LVDT with a neat diagram and give its applications.	10

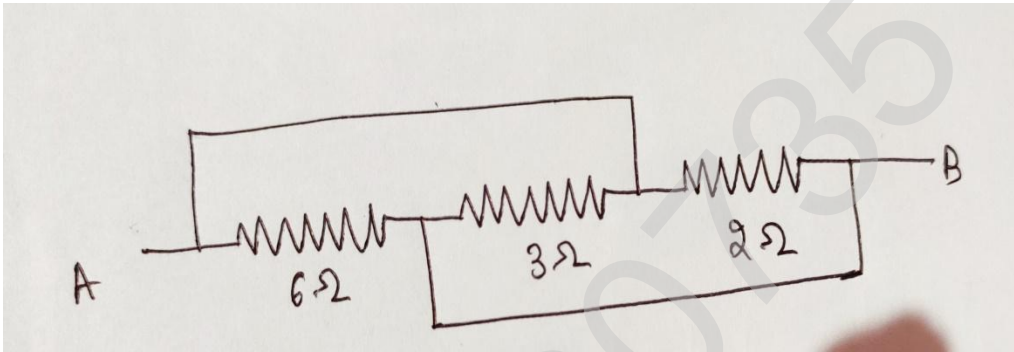
**Th.4-AB BASIC ELECTRICAL & ELECTRONICS ENGINEERING**

Full Marks: 80

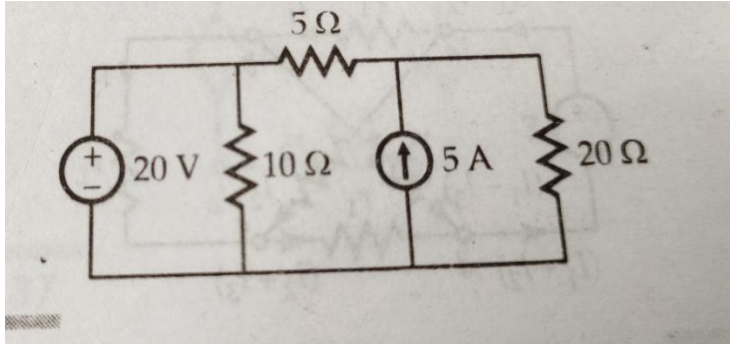
Tim: 3 Hours

Answer any **FIVE** Questions including Q No. 1 & 2

Figures in the right hand margin indicates marks

<p>1.</p> <p>a.</p> <p>b.</p> <p>c.</p> <p>d.</p> <p>e.</p> <p>f.</p> <p>g.</p> <p>h.</p> <p>i.</p> <p>j.</p>	<p>Answer ALL the questions</p> <p>Find the equivalent resistance between A &amp; B of the following network.</p> 	<p>[2x10]</p>
<p>2.</p> <p>a.</p> <p>b.</p> <p>c.</p> <p>d.</p> <p>e.</p> <p>f.</p> <p>g.</p>	<p>Answer any SIX questions.</p> <p>Explain briefly AC through RL circuit with phasor diagram.</p> <p>Describe the construction and working of filament lamp.</p> <p>What are the types of single phase induction motor and write their application?</p> <p>Explain working principle of LED. State its application.</p> <p>What is electron emission &amp; discuss each type of emission?</p> <p>What is filter? Explain its various types.</p> <p>Write the differences between AC and DC.</p>	<p>[5x6]</p>

- 3.a. What are the different configurations of BJT? Explain each with suitable diagram. [5]
- b. Calculate the power loss across  $5\Omega$  resistor. [5]



- 4.a. A resistance of  $10\Omega$ , inductance of  $0.1\text{H}$  & capacitance of  $50\mu\text{F}$  are connected in series across a  $230\text{V}$ ,  $50\text{Hz}$  supply. Find  $Y$ , power factor, active power, reactive power and apparent power. [5]
- b. With neat diagram Explain working of a full wave bridge rectifier. [5]
- 5.a. Explain the working of Nuclear Power Plant with neat block diagram. [5]
- b. Explain forward bias & reverse bias mode of operation of P-N junction. [5]
- 6.a. A building has the following electrical appliances. [5]
1. 4 tube lights of 40 watt each running for 15 hours per day
  2. 3 fans each of 80 watt running for 10 hours per day
  3. A 1 HP motor running for 5 hours per day
- Calculate the total units of energy consumed for the month of October.
- b. Classify solids according to their energy band. [5]
- 7.a. Briefly explain different parts of DC machine. [5]
- b. Explain working of CRO with block diagram. [5]

**Basic Electronics [I-SEM/Common/2018(S)]**

[Time: 1.30 Hours] [Theory-4(B)] [Lateral Entry] [Full Marks: 40]

**[Answer any FOUR Questions including Q. No 1]**

- 1) **Answer ALL questions of the following:** [2×5=10]
- (a) Define Frequency Modulation.
  - (b) What is extrinsic semiconductor? Give its classifications.
  - (c) Name different types of Electron Emission.
  - (d) Define ripple factor. What is its value for center-tapped full wave rectifier?
  - (e) What is the role of time base generator in CRO?
- 2) (a) Explain, with suitable diagram, the operation of center-tap full wave Rectifier. Also give its advantages and disadvantages. [5]
- (b) Explain the difference between AM and FM. [5]
- 3) (a) Explain with diagram the operation of  $\pi$  Filter. [5]
- (b) What is demodulation? Discuss the necessity of demodulation. [5]
- 4) (a) Draw the block diagram of straight radio receiver and explain each block.
- (b) Which type of feedback is provided in an oscillator? Discuss some of the applications of an oscillator. [5]
- 5) What is a Transistor? What are its different configurations? Draw the circuit diagram in each case using an n-p-n transistor and explain. [10]
- 6) (a) What is a p-n junction diode? Discuss the V-I characteristics of pn diode. [5]
- (b) What do you understand by a semiconductor? Discuss some important properties of semiconductor. Also give the energy band description of commonly used semiconductor. [5]

----- ALL THE BEST -----

**Basic Electronics [I-SEM/Common/2017(W)]**

**[Answer any FOUR Questions including Q. No 1 & 2]**

[Time: 1.30 Hours] [Theory-4(B)] [Lateral Entry] [Full Marks: 40]

- 1) **Answer ALL questions of the following:** [2×5=10]
- (a) Write any two applications of Electronics.
  - (b) Define work function. (E) Define photoelectric emission.
  - (c) Which type of impurity used in p-type semiconductor?
  - (d) Name different terminals of Transistor.
- 2) **Answer any Three Questions only:** [5×3=15]
- (a) Describe semiconductor and explain briefly about intrinsic and extrinsic types of semiconductor.
  - (b) What are role of filter circuit in rectifier circuit? Explain its different types.
  - (c) What is electronics emission? State different types of electron emission.
  - (d) Explain the V-I characteristics of a p-n junction diode.

(e) Draw the block diagram of a DC regulated power supply and explain the function of each block.

- 3) **Answer any TWO Questions only:** [7.5×2=15]
- (a) With neat sketch, explain the principle of working of bridge type rectifier.
  - (b) Explain the working principle of RC coupled amplifier with the help of neat circuit diagram.
  - (c) Draw the block diagram of Superhetrodyne radio receiver and explain the function of each block.
  - (d) Define modulation? Explain the process of Amplitude Modulation (AM) with the help of waveforms?

----- ALL THE BEST -----

**Basic Electronics [I-SEM/Common/2015(W)]**

**[Answer any FOUR Questions including Q. No 1]**

[Time: 1.30 Hours] [Theory-4(B)] [Lateral Entry] [Full Marks: 40]

- 1) **Answer ALL questions of the following:** [2×5=10]
- (a) Define Electronics. (C) What is PIV? (E) Name the types of filter circuits
  - (b) Define Oscillator. (D) What is ripple factor?
- 2) (a) Discuss the types of Electron Emission. [5]
- (b) Describe the operation of center-tap Rectifier. [5]
- 3) (a) Classify solids with respect to their Energy Band diagram. [5]
- (b) Explain the operation of  $\pi$  Filter. [5]
- 4) With neat block diagram explain operation of Superhetrodyne radio receiver
- 5) Describe the construction and operation principle of LVDT. [10]
- 6) (a) Explain the essential of a Transistor Oscillator. [5]
- (b) Describe the working of p-n junction. [5]

----- ALL THE BEST -----

**Basic Electronics [I-SEM/Common/2011(W)]**

**[Answer any FOUR Questions including Q. No 1 & 2]**

[Time: 1.30 Hours] [Theory-4(B)] [Full Marks: 40]

- 1) **Answer any FIVE questions of the following:** [2×5=10]
- (a) What do you understand by depletion layer of a p-n junction and write the effects on forward and reverse bias condition?
  - (b) Draw the circuit diagram of voltage divider method biasing of Transistor.
  - (c) Define modulation and why it is required?
  - (d) Write the advantages of digital multimeter over analog multimeter.
  - (e) What do you mean by Peak Inverse Voltage and how it occurs?
  - (f) Why biasing is required in transistor circuit and write different types of biasing?
  - (g) What do you mean by Insulator and what is its resistivity?



Basic Electronics [Th-4B] Semester Questions of 1<sup>st</sup> SEM Comm.

- 2) Answer any **Three Questions only:** [5×3=15]  
(a) Describe the operation of a Zener diode with V-I characteristics & write application.  
(b) What do you understand by Amplifier? Explain how amplification of signal is achieved by the help of n-p-n transistor.  
(c) Explain the working principle of Superheterodyne radio receiver with neat diagram.  
(d) Describe working principle & application of a linear variable differential transformer.  
(e) With neat circuit diagram explain the working of a full wave center-tapped rectifier.

Answer any **Two Questions.** [7.5×2=15]

- 3) What is semiconductor? Explain formation of p-type & n-type semiconductor with diagram.  
4) Explain different types of transistor configurations using p-n-p transistor and state output and input current relationships.  
5) Describe the working of the following cells and write its applications:  
(a) Photo emissive cell (B) Photo conductive cell (C) Photo voltaic cell  
6) What do you mean by electron emission? Explain different types of it with diagram.

----- ALL THE BEST -----

**Basic Electronics [I-SEM/Common/2010(W)]**

**[Answer any FOUR Questions including Q. No 1 & 2]**

**[Time: 1.30 Hours] [Theory-4(B)] [Full Marks: 40]**

- 1) Answer all Questions : [2×5=10]  
(a) What is frequency modulation and what is its channel width in comparison to Amplitude modulation?  
(b) What is Acceptor level & Donor level? (D) What is CRT & what is its application?  
(c) What is ripple factor and why it is essential? (E) Define Amplification and amplifier.  
2) Answer any **Three Questions only:** [5×3=15]  
(a) Define Transducer and classify different types of transducer. Give its application.  
(b) What is modulation and why it is needed? Give different types of Modulation.  
(c) What is Oscillator & Explain essential of Transistor oscillator with block diagram?  
(d) Define extrinsic semiconductor and explain how p-type and n-type semiconductor formed with the help of neat diagram?  
(e) State and explain the working of regulated power supply with neat block diagram.

Answer any **Two Questions.** [7.5×2=15]

- 3) Explain the principle of working & use of BJT why it is named as "Transistor"?  
4) Explain the principle of working of center-tapped fullwave type rectifier and give their merits and demerits.  
5) Explain the working principle of photo emissive, photo conductive and photo voltaic cell with a neat circuit diagram with its application.  
6) A) Which device converts air pressure into displacement and explain its working principle with neat diagram.  
B) State the difference between vacuum tube and semiconductor.

Basic Electronics [Th-4B] Semester Questions for 1<sup>st</sup> SEM Comm.

**Basic Electronics [I-SEM/Common/2009(W)]**

**[Time: 1.30 Hours] [Theory-4(B)] [Full Marks: 40]**

(Answer any FOUR Questions including Q. No 1 & 2)

- 1) Answer all Questions : [2×5=10]  
(a) What is secondary electron and where it is used?  
(b) What is doping & what impact on resistivity when it is added to pure semiconductor?  
(c) Why biasing is required and name the different types of biasing?  
(d) Why modulation is needed and names the different types of modulation?  
(e) Define transducer and name the different types of transducer.  
2) Answer any **Three Questions only:** [5×3=15]  
(a) State the different between Intrinsic and Extrinsic semiconductor.  
(b) Explain briefly transistor connections (CB, CE & CC Connections).  
(c) Explain the essentials of Transistor Oscillator.  
(d) Discuss Amplitude and Frequency modulation (Only signal wave, carrier wave and modulated wave) with neat diagram.  
(e) What is multimeter & discuss applications of multimeter and what are its different types.

Answer any **Two Questions.** [7.5×2=15]

- 3) State the working principle of Light Emitting Diode. Give its advantages & applications.  
4) State the principle of working of Bridge Rectifier with a neat circuit diagram and give their merits and demerits.  
5) Describe the working principle of LVDT with neat circuit diagram & give its application.  
6) Explain the working of super heterodyne receiver with a neat block diagram.

----- ALL THE BEST -----

**Basic Electronics [I-SEM/Common/2008(W)]**

**[Time: 1.30 Hours] [Theory-4(B)] [Full Marks: 40]**

**[Answer any FOUR Questions including Q. No 1 & 2]**

- 1) Answer all Questions : [2×5=10]  
(a) Define work function of a metal and why it is necessary?  
(b) What is Trans-receiver switch and what is its function?  
(c) What is the function of filter and how it can be achieved?  
(d) Define doping and why it is required? (E) What is DMM and what is its function?  
2) Answer any **Three Questions only:** [5×3=15]  
(a) Define Zener effect and draw the principle of working of Zener diode and why it is used as voltage stabilizer?  
(b) Which device converts D.C energy into A.C energy and explain the principle of working of any one such device with a neat diagram.  
(c) What are the different components of modulation & name different types of modulation?  
(d) Explain the principle of working & use of PNP transistor with circuit diagram.  
(e) What is Transducer? State the working principle of carbon microphone with diagram.

Basic Electronics [Th-4B] Semester Questions of 1<sup>st</sup> SEM Comm.

Answer any **Two** Questions. [7.5×2=15]

- 3) Explain briefly the conduction principle of Intrinsic & Extrinsic semiconductor with diagram.
- 4) Define amplification and explain how transistor is used as an amplifier with a neat circuit diagram. Why phase reversal in transistor occurs?
- 5) Define heterodyne & describe the working of radio receiver with a Block diagram only?
- 6) Discuss the type of radio transmitters and explain working of AM Radio transmitters with the help of Block diagram.

**Basic Electronics [I-SEM/Common/2007(W)]**

[Answer any **FOUR** Questions including Q. No 1 & 2]

[Time: 1.30 Hours] [Theory-4(B)] [Full Marks: 40]

1) Answer all Questions : [2×5=10]

- (a) What do you mean by the term work function of a metal?
- (b) Name the different types of filter circuits and which one is most suitable?
- (c) What is an amplifier and where it is used?
- (d) Define modulation and name different types of it.
- (e) What is a transducer and give examples of any two?

2) Answer any **Three** Questions only: [5×3=15]

- (a) Describe conductor, semi-conductor & insulator with energy band diagram.
- (b) What is the difference between vacuum tube and semiconductor?
- (c) Explain the working of p-n-p transistor with a neat circuit diagram.
- (d) State the basic principle of working of RADAR system.
- (e) Describe the construction and working of an SCR.

Answer any **Two** Questions. [7.5×2=15]

- 3) Define electronic emission. Explain different types of electronics emission.
- 4) With simple block diagram, explain the working of Radio Transmitter.
- 5) Explain the principle of operation of regulated power supply with Block Diagram.
- 6) Explain principle of working of Oscillator with block diagram & state its use.

----- ALL THE BEST -----

**Basic Electronics [I-SEM/Common/2006(W)]**

[Time: 1.30 Hours] [Theory-4(B)] [Full Marks: 40]

1) Answer all Questions : [2×5=10]

- (a) What are the majority carriers in -type and P-type semiconductors?
- (b) Draw the symbols of following:-  
(i) SCR (ii) Zener Diode (iii) LED (iv) PNP & NPN Transistor
- (c) State why modulation is needed?
- (d) Draw ckt diagram of full wave rectifier using center taped transformer with π-Filter.
- (e) Differentiate between Active & Passive Transducer. Give one examples of each.

Basic Electronics [Th-4B] Semester Questions for 1<sup>st</sup> SEM Comm.

2) Answer any **Three** Questions only: [5×3=15]

- (a) What is an electronic emission? Explain different types of electronics emission.
- (b) With neat diagram, explain working of a Bridge rectifier.
- (c) Describe working of a Zener diode with neat diagram. State its use.
- (d) What is an Oscillator? Explain principle of working of an oscillator. Name two oscillators used for generation Audio Signal frequency?
- (e) Briefly explain working of a dynamic Microphone.

Answer any **TWO** Questions. [7.5×2=15]

- 3) Describe working of a Black and White TV Receiver with simple block diagram.
- 4) Explain how P-type and N-type semiconductor are formed. Discuss conduction through P-type and N-type semiconductor with a neat circuit diagram.
- 5) With simple block diagram explain working of a Radio receiver.
- 6) Write Short Notes on:- (A) SCR (B) Loudspeaker

----- ALL THE BEST -----

**Basic Electronics [I-SEM/Common/2005(W)]**

[Time: 1.30 Hours] [Theory-4(B)] [Full Marks: 40]

1) Answer all Questions : [2×5=10]

- (a) Name different types of electronics emission used in electronics engineering.
- (b) Write one application for each of following  
(i) Zener diode (ii) LED (iii) SCR (iv) Integrated circuit
- (c) What is a filter? Name different types of filter used.
- (d) What is transducer? Name two different types of transducers.
- (e) Define modulation and where it is used.

2) Answer any **Three** Questions only: [5×3=15]

- (a) Explain briefly about intrinsic and extrinsic semiconductor.
- (b) State principle of working of junction diode.
- (c) Briefly explain working principle of a Bridge Rectifier with a neat diagram.
- (d) State the principle of working of carbon microphone.
- (e) Name types of amplifiers used & also write two applications of an oscillator.

Answer any **Two** Questions. [7.5×2=15]

- 3) With neat block diagram explain working of a super heterodyne radio receiver.
- 4) Explain briefly the principle of television receiver [B and W] with neat block diagram.
- 5) Explain principle of working of digital multimeter with neat block diagram.
- 6) Explain the basic principle of working of radar system.

----- ALL THE BEST -----

### Basic Electronics [I-SEM/Common/2004(W)]

[Time: 1.30 Hours] [Theory-4(B)] [Full Marks: 40]

[Answer any FOUR Questions including Q. No 1 & 2]

- 1) **Answer all Questions :** [2×5=10]  
(a) Which type of impurity is used in p-type semiconductor?  
(b) What do you mean by break over voltage of SCR? (D) Write two advantages of IC.  
(c) Define the term work function. (E) What do you mean by diffusion?
- 2) **Answer any Three Questions only:** [5×3=15]  
(a) With a neat sketch explain the working of a p-n junction.  
(b) What is electron emission? State different types of electron emission.  
(c) Explain the principle of working of carbon type microphone.  
(d) Why modulation is necessary for transmission systems?  
(e) What is role of filter circuit in rectifier circuit? Explain different types of filters.

Answer any **Two** Questions. [7.5×2=15]

- 3) With neat sketch, explain the principle of working of bridge type rectifier.  
4) With the help of block diagram, explain the working of a straight receiver.  
5) Explain the working principle of two stages R-C coupled amplifier with neat diagram.

----- ALL THE BEST -----

### Basic Electronics [I-SEM/Common/2003(W)]

[Time: 1.30 Hours] [Theory-4(B)] [Full Marks: 40]

- 1) **Answer all Questions :-** [2×5=10]  
(a) What is amplification and name the different types of amplifiers.  
(b) What is electronic emission and why it is used.  
(c) What is wireless communication system?  
(d) What is carrier wave? Where it is used? (E) Name the different types of oscillators.
- 2) **Answer any Three Questions only:-** [5×3=15]  
(a) State the principle of working of full wave center-tapped rectifier with the help of a neat circuit diagram.  
(b) What are the difference between vacuum tube and semiconductor?  
(c) State the principle of working of carbon microphone and where it is used?  
(d) Briefly explain the working of LED.  
(e) Define modulation. Name the various types of modulation & explain its significance

Answer any **Two** Questions. [7.5×2=15]

- 3) Explain in brief conduction in extrinsic semiconductor and how they are different from intrinsic semiconductor.  
4) Explain the operation of unregulated power supply with the help of simple block diagram  
5) Explain the principle of digital multimeter and where they used.  
6) Explain working of monochrome Television Receiver with a neat block diagram.

### Basic Electronics [I-SEM/Common/2002(W)]

[Time: 1.30 Hours] [Theory-4(B)] [Full Marks: 40]

(Answer any FOUR Questions including Q. No 1 & 2)

- 1) **Answer all Questions:** [2×5=10]  
(a) What is active transducer? Name one example of active transducer.  
(b) What is extrinsic semiconductor? (D) What is LED?  
(c) Write down the different amplifiers used. (E) Define modulation.
- 2) **Answer any Three Questions only:** [5×3=15]  
(a) Briefly explain working of PN-junction diode.  
(b) State principle of working of a oscillator.  
(c) Explain working of simple radio transmitter using block diagram.  
(d) Briefly explain working of a Dynamic type Loudspeaker & write use of microphone.  
(e) Briefly explain difference between vacuum tube and semi-conductors.

Answer any **Two** Questions. [7.5×2=15]

- 3) With neat diagram explain working of a bridge rectifier.  
4) Explain working of Digital Multimeter. Write down its use.  
5) Explain working of SCR and Write down uses.  
6) With neat block diagram explain working of a radio receiver.

----- ALL THE BEST -----

### Basic Electronics [I-SEM/Common/2001(W)]

[Time: 1.30 Hours] [Theory-4(B)] [Full Marks: 40]

- 1) **Answer all Questions :** [2×5=10]  
(a) What is electronic emission? Name the different type of emissions used.  
(b) What is Active transducer? Write the names of any two active transducer used.  
(c) Write down the different types of oscillators used.  
(d) Define Modulation. (E) What is an IC?
- 2) **Answer any Three Questions only:** [5×3=15]  
(a) Briefly explain working of Zener diode.  
(b) State Principle and use of seven segment display device.  
(c) What is function of a filter? Name different types of filters used.  
(d) State the uses of Radar system. (E) Briefly explain the working of LED.

Answer any **Two** Questions. [7.5×2=15]

- 3) With neat diagram explain working of a full wave rectifier using center tap transformer.  
4) Explain with neat diagram working of a Bipolar Junction Transistor. Write down the application's of Bipolar Junction Transistor.  
5) Explain working of AM Radio receiver using block diagram.

----- ALL THE BEST -----

## **[IMPORTANT LONG QUESTIONS OF B.ETC]**

1. Define electron emission. Explain different types of electronic emission.
2. Classify solids according to their energy bands.
3. Differentiate between p-type and n-type semiconductor.
4. Explain the difference between vacuum tube & semiconductor
5. Explain the biasing of pn-junction or semiconductor diode or crystal diode
6. Draw and explain the V-I characteristic of a pn-junction diode.
7. What is Zener diode? Explain the Zener diode characteristic.
8. Write the principle of working of Tunnel diode.
9. Define LED; Write the principle of working, advantage and use of LED.
10. Define and classify I.C. Write its advantages, disadvantages with applications
11. Draw and explain the circuit diagram of the half wave rectifier.
12. Draw and explain the operation of center taped full wave rectifier.
13. With neat sketch, explain the principle of working of bridge rectifier.
14. What is filter circuit? Explain different types of filter circuits used in rectifier with i/p & o/p wave.
15. Explain the working of an NPN transistor with necessary diagram.
16. Draw the circuit diagram for different transistor configuration.
17. Draw the input and output wave form of different transistor configuration.
18. Explain the Construction, working principle & applications of JFET.
19. Draw and explain the base resistor method of transistor biasing.
20. Explain with neat circuit diagram the base register biasing of transistor.
21. Explain with neat circuit diagram the voltage divider biasing of transistor.
22. Draw the block diagram of a D.C. regulated power supply system and explain the function of each block.
23. With necessary diagram explain how a Zener Diode act as Voltage Regulator
24. Briefly explain different types of Voltage Regulator circuits with IC number.
25. Draw and explain the working of Single Transistor amplifier biasing.
26. Explain the frequency response curve of RC coupled amplifier.
27. Explain the essentials of Transistor Oscillator with block diagram.

28. Discuss working of Thermocouple & its application.
29. Explain working of Multimeter and comparison between Analog and Digital.
30. With neat diagram explain Block diagram of CRO its use.
31. Draw and explain the function of each block of a simple Comm. System.
32. Define modulation. Explain the process of AM with the help of wave form.

## **[IMPORTANT SHORT QUESTIONS OF B.ETC]**

1. Differentiation Between Electrical & Electronics Devices?
2. What do you mean by Rectifier?
3. Define amplification.
4. What are the applications of electronics devices?
5. Define bound electrons, valance and free electrons.
6. Define electron emission.
7. What do you mean by surface barrier?
8. Define work function.
9. Write the names of different type of electron emission.
10. What should be the properties of thermionic emitter?
11. What do you mean thermionic emission?
12. What is primary and secondary electron in secondary electron emission?
13. What do you mean by field emission?
14. Which type of electron emissions known as cold cathode emission & why?
15. Define energy level and draw the energy level diagram.
16. Define forbidden energy gap.
17. What do you mean by negative temperature coefficient of resistance?
18. Draw the energy band diagram of semiconductor.
19. What do you mean by extrinsic semiconductor?
20. What is doping? What is the purpose of doping?
21. Classify semiconductors.
22. Differentiate between intrinsic & extrinsic semiconductor.
23. Why pentavalent impurities are called as donor impurity?
24. Write the valence of donor & acceptor impurity and a pure semiconductor.

25. Write the majority & minority charge carrier of n- and p-type semiconductor.
26. Define hole. What is its charge?
27. Write the charge of p-type, n-type and a pure semiconductor.
28. Write the advantages of semiconductor over vacuum tube.
29. Define diffusion.
30. What is potential barrier?
31. Define depletion layer.
32. Define forward biasing.
33. What happens to the resistance, when it is forward biased?
34. Define reverse biasing.
35. What do you mean by reverse saturation current?
36. Define knee voltage.
37. What is break down voltage?
38. What do you mean by peak inverse voltage?
39. What do you mean by Junction Capacitance?
40. What is the knee voltage of Si and Ge semiconductor?
41. Define Zener diode. Draw its symbol.
42. What do you mean by Zener voltage and Zener current?
43. What is the use of Zener diode?
44. What happens when a Zener diode is forward biased?
45. What do you mean by Avalanche breakdown?
46. What is LED? Draw its symbol.
47. Write the two uses of LED?
48. Define Transistor and name its different terminals.
49. Write the advantages and disadvantages of I. C.
50. Define rectification. Classify rectifiers.
51. What is the use of transformer in rectifier?
52. Draw the input and output waveform of half wave rectifier.
53. What do you mean by pulsating d.c?
54. Write the disadvantages of half wave rectifier.
55. Write the maximum rectifier efficiency of half wave and bridge rectifier.
56. What do you mean by full wave rectifier?
57. How many diodes used in center taped full wave rectifier.
58. Draw the input and output waveform of center taped full wave rectifier.
59. Write the maximum rectifier efficiency of center taped full wave rectifier
60. Write the disadvantages of center taped full wave rectifier.
61. Draw the input and output waveform of full wave bridge rectifier.
62. How many diodes used in full wave bridge rectifier.
63. Write the advantages and disadvantages of full wave bridge rectifier.
64. What do you mean by ripple factor?
65. Write the ripple factors for half wave and full wave rectifier.
66. Define transformer utilization factor.
67. What is the use of filter circuits in rectifiers?
68. Which components are taken for constructing filter circuits in rectifiers?
69. What are the different types of filter circuits in rectifier?
70. Which is the best filter circuit in rectifier?
71. What is a transistor? Why it is so called?
72. Classify Transistor.
73. How many pn-junctions are present in a transistor?
74. What are the three terminals of a transistor?
75. Which terminal of Transistor is meant for the supply of charge carriers?
76. Draw the symbols of PNP and NPN transistors.
77. Write the relation among base, emitter and collector currents.
78. Draw the circuit diagram of n-p-n, CE transistor with proper voltage.
79. Name different types of transistor connection.
80. Draw the circuit diagram for common collector connection of Transistor.
81. Draw the output characteristic curve of transistor for CE connection
82. Which type of transistor connection is known as emitter follower?
83. What do you mean by current amplification factor?
84. What are the different types of current amplification factor of transistor?
85. Define  $\alpha$  and  $\beta$ .
86. What is the relation between  $\alpha$  and  $\gamma$ ?

87. Write a single relation among  $\alpha$ ,  $\beta$  and  $\gamma$ .
88. What do you mean by faithful amplification?
89. Define transistor biasing.
90. What is the basic purpose of transistor biasing?
91. What are the different methods of transistor biasing?
92. Which method of transistor biasing is also known as fixed bias method?
93. What are the disadvantages of biasing with feedback circuit?
94. What are the functions of  $R_1$ ,  $R_2$  and  $R_E$  in voltage divider biasing method?
95. What are the advantages of voltage divider method of transistor biasing?
96. What do you mean by Q-point?
97. What is the concept of dc load line?
98. What do you mean by single stage transistor amplifier?
99. What is multi stage transistor amplifier?
100. Classify amplifier according to the type of coupling devices?
101. Define frequency response.
102. What do you mean by resonant frequency?
103. Define band width.
104. What is RC coupled amplifier?
105. What are the functions of  $R_1$ ,  $R_2$ ,  $R_E$ ,  $C_C$  &  $C_E$  in RC coupled amplifier?
106. Why the gain of RC coupled amplifier is low at both low & high frequency but it is constant during the mid frequency range?
107. Draw the frequency response curve of RC coupled amplifier.
108. Write the disadvantages of RC coupled Amplifier.
109. What are the applications of RC coupled amplifier?
110. Name the different types of transistor amplifier.
111. Define voltage & power amplifier.
112. What is an Oscillator? Classify Oscillator.
113. Write the advantages of Oscillator over Oscillator.
114. What is damped and undamped Oscillations?
115. What is tank circuit?
116. What are conditions must be fulfilled to make the oscillations in the tank circuit undamped?
117. Define Barkhausen Criteria.
118. What are the essentials of Transistor Oscillator?
119. What do you mean by positive feedback?
120. Name the different types of Transistor Oscillator.
121. What is Crystal Oscillator?
122. What is the use of transducer in comm. system?
123. Define and classify modulation
124. What do you mean by modulating and modulated wave?
125. Define amplitude modulation and draw the wave form of an AM wave.
126. Which parameter of carrier wave remains constant in AM?
127. Define FM. Draw the wave form of a FM wave.
128. Which parameter of carrier wave remains constant in FM?
129. Write the advantages of Frequency Modulation.
130. What is Phase Modulation?
131. What is demodulation and where it takes place?
132. Why demodulation is required?
133. What is the function of Transmitter?
134. What is use of tuned circuit?
135. What is a Transducer?
136. What is passive? Give two example of Active transducer.
137. What do you mean by primary and secondary Transducer?
138. Write the applications of thermocouple.
139. What is DMM? What is the use of it?
140. Writ the applications of multimeter.
141. Write merits and demerits of multimeter.
142. What is CRO and what is its application?
143. What is the heart of the CRO?
144. What is the function of aquadog of CRT?
145. What is the Concept of load regulation & line regulation?

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*"God Bless You to make Your Future Brightest"*

# 1. ELECTRONIC DEVICES

## [1.1. Basic Concepts of Electronics]

- 1) The process of converting DC to AC \_\_\_\_\_.
- (a) Rectification
  - (b) Oscillation
  - (c) Amplification
  - (d) Filtration
- 2) The electron present in the outermost orbit of an atom is known as \_\_\_\_\_.
- (a) Bound electron
  - (b) Valence electron
  - (c) Free electron
  - (d) Conduction electron

## [1.2. ELECTRON EMISSION]

- 1) The additional amount of energy required to overcome the surface barrier of the metal is \_\_\_\_.
- (a) Doping
  - (b) Work function
  - (c) Potential barrier
  - (d) Diffusion
- 2) Which electrons emission is known as cold cathode emission?
- (a) Photo-electric emission
  - (b) Thermionic emission
  - (c) Secondary emission
  - (d) Field emission
- 3) Work function of metals is measured in \_\_\_\_\_.
- (a) Coulomb
  - (b) Hertz
  - (c) Electron volt
  - (d) Newton
- 4) A desirable characteristic of an emitter is that it should have \_\_\_\_\_ work function.
- (a) Large
  - (b) Very large
  - (c) Small
  - (d) None of the above
- 5) The fixed amount of energy possessed by each orbit of a single atom is known as \_\_\_\_\_.
- (a) Energy level
  - (b) Energy band
  - (c) Forbidden energy gap
  - (d) Surface barrier

- 6) A hole of a semiconductor is defined as \_\_\_\_\_.
- (a) Absence of proton
  - (b) Absence of electron
  - (c) Presence of electron
  - (d) Presence of proton

- 7) Electron which strike to emitter in secondary electron emission is called as \_\_\_\_\_.
- (a) Secondary Electron
  - (b) Primary Electron
  - (c) Free Electron
  - (d) Valance Electron

## [1.3. Classification of Materials]

- 1) The separation between valence band and conduction band is known as \_\_\_\_\_.
- (a) Doping
  - (b) Diffusion
  - (c) Fabrication
  - (d) Forbidden energy gap
- 2) In which material valence band and conduction band are overlaps to each other?
- (a) Insulator
  - (b) Resistor
  - (c) Conductor
  - (d) Semi conductor
- 3) The forbidden energy gap in case of insulator is nearly equal to \_\_\_\_\_.
- (a) 1 ev
  - (b) 15 ev
  - (c) 0 ev
  - (d) 0.67 ev
- 4) A semiconductor has \_\_\_\_\_ temperature coefficient of resistance.
- (a) Negative
  - (b) Positive
  - (c) Zero
  - (d) None of above

## [1.4. SEMICONDUCTOR]

- 1) A semiconductor is formed by ..... bonds.
- (a) Covalent
  - (b) Electrovalent
  - (c) Co-ordinate
  - (d) None of the above
- 2) The most commonly used semiconductor is .....
- (a) Germanium
  - (b) Silicon
  - (c) Carbon
  - (d) Sulphur
- 3) A semiconductor has generally ..... valence electrons.
- (a) 2
  - (b) 3
  - (c) 6
  - (d) 4



4) When a pure semiconductor is heated then its resistance \_\_\_\_\_.

- (a) Goes up
- (b) Goes down
- (c) Remain the same
- (d) Can't say

5) In Intrinsic semiconductor the current conduction carried by \_\_\_\_\_?

- (a) Free electron Only
- (b) Holes Only
- (c) Both (a) and (b)
- (d) None of the above

6) In an intrinsic semiconductor, the number of free electrons .....

- (a) Equals the number of holes
- (b) Is greater than the number of holes
- (c) Is less than the number of holes
- (d) None of the above

7) At room temperature, an intrinsic silicon crystal acts approximately as .....

- (a) A battery
- (b) A conductor
- (c) An insulator
- (d) A piece of copper wire

8) The valence of donor impurity \_\_\_\_?

- (a) 2
- (b) 3
- (c) 4
- (d) 5

9) Acceptor impurity is found in \_\_\_\_ material?

- (a) N-type semiconductor
- (b) P-type semiconductor
- (c) Pure semiconductor
- (d) Conductor

10) If doping to a pure semiconductor increases, the resistance of the semiconductor .....

- (a) Remains the same
- (b) Increases
- (c) Decreases
- (d) None of the above

11) Minority charge carrier of N-type semiconductor \_\_\_\_\_.

- (a) Free electron
- (b) Holes
- (c) Valence electron
- (d) Bound electron

12) Addition of pentavalent impurity in a semiconductor creates many \_\_\_\_\_.

- (a) Free electron
- (b) Holes
- (c) Valence electrons
- (d) Bound electrons

13) Charge of P-type Semiconductor is \_\_\_\_\_.

- (a) Positive
- (b) Negative
- (c) Neutral
- (d) Either positive or negative

14) The impurity level in extrinsic semiconductor is about \_\_\_\_\_ of pure semiconductor.

- (a) 1 atoms for 8 atoms
- (b) 1 atom for  $10^8$  atoms
- (c) 1 atom for  $10^4$  atoms
- (d) 1 atom for 100 atoms

### [1.5. PN JUNCTION DIODE]

1) A crystal diode is used as .....

- (a) an amplifier
- (b) a rectifier
- (c) an oscillator
- (d) a voltage regulator

2) An ideal crystal diode is one which behaves as a perfect ..... when it is forward biased.

- (a) conductor
- (b) insulator
- (c) resistance material
- (d) none of the above

3) The barrier created in PN Junction against further movement of charge carrier is \_\_\_\_\_.

- (a) Surface Barrier
- (b) Thermal Barrier
- (c) Potential Barrier
- (d) Zener Barrier

4) The battery connections required to forward bias a pn junction are .....

- (a) +ve terminal to p and -ve terminal to n
- (b) -ve terminal to p and +ve terminal to n
- (c) -ve terminal to p and -ve terminal to n
- (d) None of the above

5) If the arrow of crystal diode symbol is positive w.r.t. bar, then it is \_\_\_\_ biased.

- (a) Forward
- (b) Reverse
- (c) Either forward or reverse
- (d) None of the above

6) In forward bias condition of PN junction \_\_\_\_\_.

- (a) Potential barrier reduced
- (b) Junction offer low resistance
- (c) Current flows in the circuit
- (d) All the above

7) The barrier voltage at a pn junction for Ge .....

- (a) 3 V
- (b) 5 V
- (c) 0 V
- (d) 0.3 V

**8)** The forward voltage drop across a silicon diode is about .....

- (a) 0.7 V
- (b) 2.5 V
- (c) 3 V
- (d) 10 V

**9)** In the depletion region of a pn junction, there is a shortage of .....

- (a) Acceptor ions
- (b) Holes and electrons
- (c) Donor ions
- (d) None of the above

**10)** A reverse bias pn junction has .....

- (a) Very narrow depletion layer
- (b) Almost no current
- (c) Very low resistance
- (d) Large current flow

**11)** A pn junction acts as a .....

- (a) Controlled switch
- (b) Bidirectional switch
- (c) Unidirectional switch
- (d) None of the above

**12)** Reverse Saturation Current of diode is due to

- (a) The minority carriers
- (b) The majority carriers
- (c) Negative ions.
- (d) Both (a) and (b)

**13)** Knee Voltage of the diode is the

- (a) Minimum Forward Voltage
- (b) Maximum Forward Voltage
- (c) Minimum Reverse Voltage
- (d) Maximum Reverse Voltage

**14)** The knee voltage of a crystal diode is approximately equal to .....

- (a) applied voltage
- (b) breakdown voltage
- (c) forward voltage
- (d) barrier potential

**15)** The minimum reverse bias voltage at which PN junction breaks down with sudden increase in reverse current?

- (a) Knee voltage
- (b) Break down voltage
- (c) Peak inverse voltage
- (d) Feedback voltage

**16)** The reverse current in diode is the order of \_\_

- (a) kA
- (b) mA
- (c) A
- (d)  $\mu$ A

**17)** A reverse biased PN junction has resistance of

- (a)  $\Omega$
- (b) k $\Omega$
- (c) M $\Omega$
- (d) None of the above

**18)** The maximum reverse bias voltage that can be applied to the PN junction without damage to it is known as \_\_\_\_\_

- (a) Knee Voltage
- (b) Break down Voltage
- (c) Peak Inverse Voltage
- (d) Zener Voltage

**19)** With forward bias to a pn junction, the width of depletion layer .....

- (a) Decreases
- (b) Increases
- (c) Remains the same
- (d) None of the above

**20)** If the doping level of a crystal diode is increased, then breakdown voltage \_\_\_\_

- (a) remains the same
- (b) is increased
- (c) is decreased
- (d) None of the above

**21)** When the graph between current through and voltage across a device is a straight line, the device is referred to as .....

- (a) linear
- (b) active
- (c) nonlinear
- (d) passive

**22)** A crystal diode is a ..... device

- (a) linear
- (b) non-linear
- (c) bilateral
- (d) none of the above

**23)** A crystal diode utilizes ..... characteristic for rectification

- (a) reverse
- (b) forward
- (c) forward or reverse
- (d) none of the above

## 1.6. ZENER DIODE

**1)** A properly doped crystal diode having sharp break down voltage is known as \_\_\_\_\_.

- (a) Tunnel diode
- (b) Light-emitting diode
- (c) Photo diode
- (d) Zener diode

2) A Zener diode has .....  
(a) one pn junction  
(b) two pn junctions  
(c) three pn junctions  
(d) none of the above

3) The doping level in a Zener diode is ..... that of a crystal diode  
(a) the same as  
(b) less than  
(c) more than  
(d) none of the above

4) A Zener diode is used as .....  
(a) a Voltage Amplifier  
(b) a Voltage Regulator  
(c) a Rectifier  
(d) a Multivibrator

5) A Zener diode is always ..... connected.  
(a) reverse  
(b) forward  
(c) either reverse or forward  
(d) none of the above

6) A Zener diode utilizes ..... Characteristics for its operation.  
(a) forward  
(b) reverse  
(c) both forward and reverse  
(d) none of the above

7) In the breakdown region, a Zener diode behaves like a ..... source.  
(a) constant voltage  
(b) constant current  
(c) constant resistance  
(d) none of the above

8) A Zener diode is destroyed if it.....  
(a) is forward biased  
(b) is reverse biased  
(c) carrier more than rated current  
(d) none of the above

9) A Zener diode is ..... device  
(a) a non-linear  
(b) a linear  
(c) an amplifying  
(d) none of the above

10) A Zener diode has ..... breakdown voltage  
(a) undefined  
(b) sharp  
(c) zero  
(d) none of the above

11) When a Zener diode is connected in forward bias condition it will .....  
(a) Act as a voltage regulator  
(b) Damaged  
(c) Act as an ordinary diode  
(d) Act as amplifier

## 1.7. LIGHT EMITTING DIODE

1) A LED emits light when it is .....  
(a) Reverse Biased  
(b) Forward Biased  
(c) Either Reverse or Forward Biased  
(d) It doesn't emit light.

2) Generally LEDs are made from which type of materials?  
(a) Silicon  
(b) Germanium  
(c) Gallium Arsenide  
(d) Carbon

## 1.8. INTEGRATED CIRCUIT

1) In which of the following component can't fabricate in IC?  
(a) Resistor  
(b) Capacitor  
(c) Inductor  
(d) Transistor

2) When more than one components are fabricated in a single chip is known as .....  
(a) Insulated circuit  
(b) Integrated circuit  
(c) Intrinsic circuit  
(d) Induced circuit

## 2. ELECTRONIC CIRCUITS

### 2.1. RECTIFIER

1) Number of diodes required in centre tapped rectifier?  
(a) 4  
(b) 3  
(c) 2  
(d) 1

2) Rectification efficiency of bridge rectifier?  
(a) 0.406  
(b) 0.812  
(c) 0.480  
(d) 1.210

3) The maximum efficiency of a half-wave rectifier is .....  
(a) 40.6 %  
(b) 81.2 %  
(c) 50 %  
(d) 25 %

4) The ripple factor of a half-wave rectifier is .....  
(a) 2.12  
(b) 1.21  
(c) 0.46  
(d) 0.48

5) Ripple factor for center tapped rectifier is  
(a) 1.21  
(b) 0.84  
(c) 40.6  
(d) 0.48

6) In rectification circuit the output voltage of transformer is .....  
(a) Pure DC  
(b) Pulsating DC  
(c) Step down AC  
(d) Steady DC

7) The most widely used rectifier is \_\_\_\_\_ ?  
(a) Half wave rectifier.  
(b) Center tapped rectifier  
(c) Bridge rectifier  
(d) Midpoint rectifier

8) There is a need of transformer for .....  
(a) half-wave rectifier  
(b) centre-tap full-wave rectifier  
(c) bridge full-wave rectifier  
(d) none of the above

9) The PIV rating of each diode in bridge rectifier is ..... that of the equivalent centre-tap rectifier  
(a) one-half  
(b) the same as  
(c) twice  
(d) four times

10) For the same secondary voltage, the output voltage from a centre-tap rectifier is ..... than that of bridge rectifier  
(a) twice  
(b) thrice  
(c) four time  
(d) one-half

## 2.2. FILTER

1) The basic purpose of a Filter is to  
(a) Minimize variations in a.c. input signal.  
(b) Suppress harmonics in rectified output.  
(c) Remove ripples from the rectified output.  
(d) Stabilize d.c. output voltage

2) The factor which represents the AC signal present in rectified output is known as \_\_\_\_\_.  
(a) Power factor  
(b) Form factor  
(c) Ripple factor  
(d) Current factor

3) Which one of the following is best filter  
(a) Inductive Filter  
(b) Capacitive Filter  
(c) LC Filter  
(d)  $\pi$  Filter

4) Which one of the following is correct sentence?  
(a) Inductor allows DC but blocks AC  
(b) Capacitor allows DC but blocks AC  
(c) Capacitor blocks DC but allows AC  
(d) Both (a) and (c)

## 2.3. DC POWER SUPPLY

1) Why we need voltage regulator?  
(a) To increase the output voltage  
(b) To decrease the output voltage  
(c) To ensure constant output voltage  
(d) To increase output current

2) Which one of the following component can be used as voltage regulator?  
(a) Zener Diode  
(b) Photo Diode  
(c) Light Emitting Diode  
(d) Tunnel Diode

3) A series resistance is connected in the Zener circuit to.....  
(a) properly reverse bias the Zener  
(b) protect the Zener  
(c) properly forward bias the Zener  
(d) none of the above

## 2.4. TRANSISTOR

1) What is the full form of BJT?  
(a) Bipolar Junction Transmitter  
(b) Bipolar Junction Transformer  
(c) Bipolar Junction Transducer  
(d) Bipolar Junction Transistor

2) Choose the correct statement for a BJT.  
(a) Its I/P resistance is more than O/P resistance  
(b) Its I/P resistance is less than O/P resistance  
(c) Its I/P resistance is equal to O/P resistance  
(d) None of the above.

3) A transistor has .....  
(a) one pn junction  
(b) two pn junctions  
(c) three pn junctions  
(d) four pn junctions

**4)** The number of depletion layers in transistor is  
(e) four  
(f) three  
(g) one  
(h) two

**5)** The base of a transistor is ..... doped  
(a) heavily  
(b) moderately  
(c) lightly  
(d) none of the above

**6)** The element that has the biggest size in a transistor is .....  
(a) collector  
(b) base  
(c) emitter  
(d) collector-base-junction

**7)** In a pnp transistor, the current carriers are .....  
(a) acceptor ions  
(b) donor ions  
(c) free electrons  
(d) holes

**8)** The collector of a transistor is ..... doped  
(a) heavily  
(b) moderately  
(c) lightly  
(d) none of the above

**9)** What is true in case of an Emitter terminal of Transistor?  
(a) It is heavily doped as compared to Base and Collector  
(b) It is Lightly doped as compared to Base and Collector  
(c) Its Size is large as compared to Base and Collector  
(d) Both (a) and (c)

**10)** A BJT is a ..... operated device  
(a) current  
(b) voltage  
(c) both voltage and current  
(d) none of the above

**11)** In a npn transistor, ..... are the minority carriers  
(a) free electrons  
(b) holes  
(c) donor ions  
(d) acceptor ions

**12)** The emitter of a transistor is ..... doped  
(a) lightly  
(b) heavily  
(c) moderately  
(d) none of the above

**13)** In a transistor, the base current is about ..... of emitter current  
(a) 25%  
(b) 20%  
(c) 35 %  
(d) 5%

**14)** The input impedance of a transistor is .....  
(a) high  
(b) low  
(c) very high  
(d) almost zero

**15)** At the base-emitter junctions of a BJT, one finds .....  
(a) a reverse bias  
(b) a wide depletion layer  
(c) low resistance  
(d) none of the above

**16)** Most of the majority carriers from emitter ....  
(a) recombine in the base  
(b) recombine in the emitter  
(c) pass through the base region to the collector  
(d) none of the above

**17)** In a transistor .....  
(a)  $I_C = I_E + I_B$   
(b)  $I_B = I_C + I_E$   
(c)  $I_E = I_C - I_B$   
(d)  $I_E = I_C + I_B$

**18)** The collector-base junction in BJT has\_\_\_\_  
(a) forward bias at all times  
(b) reverse bias at all times  
(c) low resistance  
(d) none of the above

**19)** Pick the correct line for Input characteristic for CE Transistor Connection?  
(a) The curve between  $I_C$  &  $V_{BC}$  at constant  $I_E$   
(b) The curve between  $I_B$  &  $V_{BE}$  at constant  $V_{CE}$   
(c) The curve between  $I_B$  &  $V_{CE}$  at constant  $V_{BE}$   
(d) The curve between  $I_C$  &  $V_{CE}$  at constant  $I_B$

**20)** The ratio of between  $I_B$  to that of  $I_C$  is equal to \_\_\_\_\_  
(a)  $\alpha$   
(b)  $\beta$   
(c)  $\gamma$   
(d)  $1/\beta$

**21)** Pick the wrong statement about different Transistor Configurations?  
(a) In CC connection I/P resistance is high as compared to its O/P resistance  
(b) In CB connection I/P resistance is low as compared to its O/P resistance

- (c) In CE connection I/P resistance is low as compared to its O/P resistance
- (d) In CC connection I/P resistance is low as compared to its O/P resistance

## 2.5. TRANSISTOR BIASING

- 1) By which resistance voltage divider bias of transistor provides best stabilization.
  - (a)  $R_1$
  - (b)  $R_2$
  - (c)  $R_C$
  - (d)  $R_E$
- 2) Transistor Biasing refers to
  - (a) The proper flow of zero signal  $I_C$  and the maintenance of  $V_{CE}$
  - (b) The proper flow of zero signal  $I_B$  and the maintenance of  $V_{BE}$
  - (c) The proper flow of zero signal  $I_C$  and the maintenance of  $V_{BC}$
  - (d) The proper flow of zero signal  $I_E$  and the maintenance of  $V_{CE}$
- 3) Faithful amplification of Transistor refers to
  - (a) Increase in frequency of the signal without any change in shape
  - (b) Increase in magnitude of the signal with change in shape
  - (c) Increase in magnitude of the signal without any change in shape
  - (d) Increase in wavelength of the signal without any change in shape

-----☪-----☪----- ALL THE BEST -----☪-----☪-----

## [ANSWER KEY]

### 1. ELECTRONIC DEVICES

#### [1.1. Basic Concepts of Electronics]

- 1) [B] Oscillation
- 2) [D]

#### [1.2. ELECTRON EMISSION]

- 1) [B] Work Function
- 2) [D] Field Emission
- 3) [C] Electron volt
- 4) [C] Small
- 5) [A] Energy Level
- 6) [B] Absence of Electron
- 7) [B] Primary Electron

#### [1.3. CLASSIFICATION OF MATERIALS]

- 1) [D] Forbidden energy gap
- 2) [C] Conductor
- 3) [B] 15 eV
- 4) [A] Negative

#### [1.4. SEMICONDUCTOR]

- 1) [A] Covalent
- 2) [B] Silicon
- 3) [D] 4
- 4) [B] Goes down
- 5) [C] Both (a) and (b)
- 6) [A] Equals the number of holes
- 7) [C] An insulator
- 8) [D] 5
- 9) [B] P-type semiconductor
- 10) [C] Decreases
- 11) [B] Holes
- 12) [A] Free electron
- 13) [C] Neutral
- 14) [B] 1 atom for  $10^8$  atoms

#### [1.5. PN JUNCTION DIODE]

- 1) [B] a rectifier
- 2) [A] conductor
- 3) [C] Potential Barrier
- 4) [A] +ve terminal to p and -ve terminal to n
- 5) [A] Forward
- 6) [D] All the above
- 7) [D] 0.3 V
- 8) [A] 0.7 V

- 9) [B] Holes and electrons
- 10) [B] Almost no current
- 11) [C] Unidirectional switch
- 12) [A] The minority carriers
- 13) [A] Minimum Forward Voltage
- 14) [D] barrier potential
- 15) [B] Break down voltage
- 16) [D]  $\mu\text{A}$
- 17) [C]  $\text{M}\Omega$
- 18) [C] Peak Inverse Voltage
- 19) [A] Decreases
- 20) [C] is decreased
- 21) [A] Linear
- 22) [B] Non-linear
- 23) [B] Forward

### [1.6. ZENER DIODE]

- 1) [D] Zener diode
- 2) [B] Two pn junctions
- 3) [C] More than
- 4) [B] a Voltage Regulator
- 5) [A] Reverse
- 6) [B] Reverse
- 7) [A] Constant voltage
- 8) [C] Carrier more than rated current
- 9) [A] a Non-linear
- 10) [C] Sharp
- 11) [C] ACT as a ordinary diode

### [1.7. LIGHT EMITTING DIODE]

- 1) [B] Forward Biased
- 2) [C] Gallium Arsenide

### [1.8. INTEGRATED CIRCUIT]

- 1) [C] Inductor
- 2) [B] Integrated circuit

## 2. ELECTRONIC CIRCUITS

### 2.1. RECTIFIER

- 1) [C] 2
- 2) [B] 0.812
- 3) [A] 40.6%
- 4) [B] 1.21
- 5) [B] 0.48
- 6) [C] Step down AC
- 7) [C] Bridge Rectifier

8) [B] Centre-tap full-wave rectifier

9) [A] One-half

10) [D] One half

### 2.2. FILTER

- 1) [C] Remove ripples from the rectified output.
- 2) [C] Ripple factor
- 3) [D]  $\pi$  Filter
- 4) [D] Both (a) and (c)

### [2.3. DC POWER SUPPLY]

- 1) To ensure constant output voltage
- 2) Zener Diode
- 3) Protect the Zener

### [2.4. TRANSISTOR]

- 1) [D] Bipolar Junction Transistor
- 2) [B] Its I/P resistance is less than O/P resistance
- 3) [B] Two pn junctions
- 4) [D] Two
- 5) [C] Lightly
- 6) [A] Collector
- 7) [D] Holes
- 8) [B] Moderately
- 9) [A] It is heavily doped as compared to Base and Collector
- 10) [A] Current
- 11) [B] Holes
- 12) [B] Heavily
- 13) [D] 5%
- 14) [B] Low
- 15) [C] low resistance
- 16) [C] pass through the base region to collector
- 17) [D]  $I_E = I_C + I_B$
- 18) [B] Reverse bias at all times
- 19) [B] curve between  $I_B$  &  $V_{BE}$  at constant  $V_{CE}$
- 20) [D]  $1/\beta$
- 21) In CC connection I/P resistance is low as compared to its O/P resistance

### [2.5. TRANSISTOR BIASING]

- 1)  $R_E$
- 2) The proper flow of zero signal  $I_C$  and the maintenance of  $V_{CE}$
- 3) Increase in magnitude of the signal without any change in shape