

Total No. of Questions :4]

SEAT No. :

[Total No. of Pages : 1

**P5**

**FE/Insem./APR-5**

**F.E. (Semester - II)**

**104010 : BASIC ELECTRONICS ENGINEERING**

**(2019 Pattern)**

*Time : 1 Hour]*

*[Max. Marks : 30*

*Instructions to the candidates:*

- 1) Answer Q.1 or Q.2, Q.3 or Q.4.
- 2) Assume suitable data if necessary.

**Q1)** a) What is extrinsic semiconductor. Explain P-type & N-type semiconductor. [5]

b) Draw and Explain Half Wave Rectifier (HWR) with its corresponding input and output waveforms. [5]

c) Compare LED and Photodiode. [5]

OR

**Q2)** a) Define active and passive components. Explain them with suitable examples. [5]

b) For full wave bridge rectifier, applied input voltage is  $5\sin \omega t$ . Calculate average output voltage, RMS voltage and PIV rating of diode used. [5]

c) Explain V-I characteristics of zener diode. [5]

**Q3)** a) Draw and explain \_\_\_\_\_ output characteristics of BJT in common emitter configuration. Show different regions of operation. [5]

b) Draw and explain MOSFET as a switch. [5]

c) For a Non - Inverting amplifier using op-amp if  $R_f = 20k\Omega$  and  $R_1 = 1k\Omega$ ,  $V_{cc} = \pm 15V$ . Calculate Output voltage for  $v_{in} = 3V$  and comment on the result. [5]

OR

**Q4)** a) Define transistor. Mention its types. For BJT, if  $I_B = 20\mu A$  and  $I_E = 2mA$ . Calculate value of  $I_C$  and  $\beta$  (Beta). [5]

b) Draw and Explain the drain characteristics of N-channel EMOSFET. Show the different regions of operation on the characteristics. [5]

c) Draw and explain functional block diagram of operational amplifier (op-amp). [5]

Total No. of Questions : 8]

SEAT No. :

P6490

[Total No. of Pages : 2

[5868]-106

F.E.

**BASIC ELECTRONICS ENGINEERING  
(2019 Pattern) (Semester - I & II) (104010)**

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Solve Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right indicate full marks.
- 4) Use of logarithmic tables slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.
- 5) Assume suitable data if necessary.

**Q1)** a) Convert [6]

i)  $(2BA.OC)_{16}$  to Octal.

ii)  $(462.27)_8$  to Hexadecimal

b) Why NAND and NOR are known as universal logic gates? [6]

c) Draw and explain block diagram of microprocessor. [5]

OR

**Q2)** a) Perform the following arithmetic operations. [5]

i)  $(110011 - 111001)$  using 2's complement method.

ii)  $(111011.11 + 100100.01)$

b) State and prove Demorgan's Theorems. [6]

c) Draw and explain block diagram of microcontroller. [6]

**Q3)** a) Explain principle of operation and block diagram Digital Multimeter. [6]

b) Explain working of Auto-Transformer List its applications. [6]

c) Explain operation of DC Ammeter with suitable diagram. Explain circuit or multi-range Ammeter. [6]

OR

**Q4)** a) Draw block diagram of function generator and explain functions of each block. [6]

b) Explain Digital storage oscilloscope. List its applications. [6]

c) Explain operation of DC voltmeter with suitable diagram. Explain circuit of multi-range voltmeter. [6]

P.T.O.

- Q5)** a) Draw construction of LVDT and explain its operation. Write its advantages, disadvantages and applications. [6]
- b) Explain RTD with its construction, working, advantages, disadvantages and applications. [6]
- c) Explain operation of Bio-sensor with one application. [5]

OR

- Q6)** a) What are different types of transducers? Give one example of each type. [5]
- b) Explain working principle of strain guage. Explain load cell. [6]
- c) Explain Thermocouple with its construction, working, advantages, disadvantages and applications. [6]
- Q7)** a) Explain different types of cables used in electronic communication. [6]
- b) Draw and explain block diagram of FM transmitter. [6]
- c) Draw and explain block diagram of GSM. [6]

OR

- Q8)** a) With the help of block diagram, explain operation of communication system. [6]
- b) Explain IEEE electromagnetic frequency spectrum and state allotment of frequency bands for different applications. [6]
- c) Explain block diagram of AM transmitter (High Power). [6]



Total No. of Questions : 8]

SEAT No. :

**P3922**

[Total No. of Pages : 2

**[60011-4006**

**F.E.**

**BASIC ELECTRONICS ENGINEERING  
(2019 Pattern) (Semester - II) (104010)**

*Time : 2½ Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) Attempt Q.No.1 or Q.No.2, Q.No.3 or Q.No.4, Q.No.5 or Q.No.6, Q.No.7 or Q.No.8.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right indicate full marks.
- 4) Assume suitable data, if necessary.

**Q1) a) i) Convert:**

- 1)  $(372.26)_8$  to Hexadecimal
- 2)  $(5F1.6C)_{16}$  to Octal
- 3)  $(9D.33)_{16}$  to Decimal

ii) Solve:

- 1)  $(110011-111001)$  using 2s compliment method
- 2)  $(1101 \times 110)$
- 3)  $(111011.11+100100.01)$

**[6]**

b) Define Universal Logic Gates. Why they known as Universal Logic Gates?

**[6]**

c) Draw block diagram of Microprocessor and explain function of each block.

**[6]**

**OR**

**Q2) a)** With the help of truth table, explain operation of AND, OR, EX-OR gates.

**[6]**

b) State and prove De-Morgan's Theorems.

**[6]**

c) Explain in detail the working of a full adder with the help of a truth table and give its sum and carry.

**[6]**

**P.T.O.**

- Q3)** a) Explain digital multimeter with block diagram. [6]  
b) Explain Power Scope with block diagram. [5]  
c) Explain how to convert Galvanometer to Analog Voltmeter and how to use it as multi-range Voltmeter? [6]

OR

- Q4)** a) Explain function Generator with block diagram. [6]  
b) Explain Auto Transformer and list its applications. [5]  
c) Explain how to convert Galvanometer to Analog Ammeter and how to use it as multi-range Ammeter? [6]

- Q5)** a) Explain selection criteria of transducers. [6]  
b) Draw construction of LVDT and explain its operation. Write its advantages, disadvantages and applications. [6]  
c) Explain working principle of strain gauge. Explain load cell. [5]

OR

- Q6)** a) Differentiate between active and passive sensors. [6]  
b) Explain RTD with its construction, working, advantages, disadvantages and applications. [6]  
c) Explain operation of Biosensor with one application. [5]

- Q7)** a) With the help of block diagram, explain basic communication system. [6]  
b) Explain IEEE electromagnetic frequency spectrum and state allotment of frequency bands for different applications. [6]  
c) Draw diagram explain GSM architecture. [6]

OR

- Q8)** a) Explain different types of cables used in electronic communication. [6]  
b) Draw block diagram of FM Transmitter and explain. [6]  
c) Explain cellular communication system. [6]

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Total No. of Questions : 8]

SEAT No. :

P4936

[Total No. of Pages : 2

[5667]-1006

F.E. (Semester - I)

BASIC ELECTRONICS ENGINEERING

(2019 Pattern)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates :

- 1) Neat diagrams must be drawn wherever necessary.
- 2) Figures to right indicate full marks.
- 3) Assume suitable data, if necessary.

Q1) a) State and prove De'Morgan's sum & product theorem with the help of truth table. [6]

b) Design and implement full adder circuit. Write the expressions for sum and carry. [6]

- c) i) Convert  $(105.15)_{10}$  to binary
- ii) Convert  $(4057.068)_8$  to decimal
- iii) Convert  $(1101101110.1001101)_2$  to hexadecimal
- iv) Find 1's complement of 111001
- v) Find  $(11100-01111)_2$  using two's complement.

[5]

OR

Q2) a) What is flipflop? Draw & Explain the working of clocked SR Flip flop. [6]

b) Compare microprocessor and microcontroller. [6]

c) Design and Implement half adder circuit. [5]

Q3) a) Draw and Explain the block diagram of digital multimeter. [6]

b) Explain the block diagram of AC/DC power supply. [6]

c) Explain the working of function generator with neat diagram. [6]

OR

P.T.O.

- Q4)** a) Draw and explain the block diagram of digital storage oscilloscope. [6]  
b) Explain DC ammeter. Explain, how the range of DC ammeter can be extended. Determine expression for shunt resistance. [6]  
c) Explain construction and working of an autotransformer. [6]

- Q5)** a) Explain the construction and working of LVDT. [6]  
b) Write a short note on two temperature transducers / sensors. [6]  
c) Explain the construction and working of load cell. Give one application. [5]

OR

- Q6)** a) Explain the working of biosensors with the help of neat block diagram. Give one application. [6]  
b) Draw and explain the working of accelerometer. [6]  
c) An RTD is inserted in an oven is having a resistance  $160\Omega$ . At  $0^\circ\text{C}$  resistance is  $100\Omega$  and its resistance temperature coefficient is 0.00392. Determine the change in temperature. [5]

- Q7)** a) Explain the block diagram of electronic communication system. [6]  
b) Distinguish between co-axial cable and optical fiber cable. [6]  
c) Describe the block diagram of AM-transmitter. [6]

OR

- Q8)** a) Draw and explain electromagnetic spectrum along with their applications. [6]  
b) Draw and explain the block diagram of FM receiver. [6]  
c) Diagrammatically explain GSM architecture. [6]

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Total No. of Questions : 4]

SEAT No. :

P-5372

[Total No. of Pages : 1

[6185]-55

F.E. (Insem.)

**BASIC ELECTRONICS ENGINEERING**  
**(2019 Pattern) (Semester - I) (104010)**

*Time : 1 Hour]*

*[Max. Marks : 30*

*Instructions to the candidates:*

- 1) *Attempt Q.1 or Q.2, Q.3 or Q.4.*
- 2) *Figures to the right indicate full marks.*

- Q1)** a) Compare half wave rectifier and full wave rectifier. [5]  
b) Explain the construction and working principle of LED. [5]  
c) Explain impact of Electronics on society and industry. [5]

OR

- Q2)** a) Compare active and passive components. [5]  
b) Explain the operation of bridge rectifier circuit with diagram. [5]  
c) Explain the construction and working of photodiode. [5]

- Q3)** a) Draw and explain input and output characteristics of BJT in common emitter configuration, show different regions of operation. [5]  
b) Compare BJT and MOSFET. [5]  
c) Draw and explain Internal Block diagram of OP-AMP. [5]

OR

- Q4)** a) Explain with suitable diagram operation of NPN transistor [5]  
b) Explain construction and operation of n-channel E-MOSFET. [5]  
c) State and explain practical parameters of OP-AMP. [5]





Total No. of Questions : 4]

SEAT No. :

P1273

[Total No. of Pages : 2

**OCT/FE/INSEM/-6**  
**F.E. (Semester - I)**  
**BASIC ELECTRONICS ENGINEERING**  
**(2019 Pattern)**

*Time : 1 Hour]*

*[Max. Marks : 30*

*Instructions to the candidates:*

- 1) Answer Q.1 or Q.2, Q.3 or Q.4
- 2) Figure to right indicate full marks.

- Q1)** a) Compare active and passive components explain passive components. [5]  
b) Explain the operation of full wave Rectifier with suitable diagram and wave forms. [5]  
c) Explain the construction and working principle of LED. [5]

OR

- Q2)** a) Explain impact of electronics on Industry. [5]  
b) Explain the construction and working of P - N junction diode. Draw its V - I characteristics. [5]  
c) Draw circuit diagram of zener diode as voltage regulator and Explain it. [5]

- Q3)** a) Draw and explain BJT as a switch. [5]  
b) Explain construction and operation of N - channel EMOSFET. [5]  
c) For inverting amplifier using op = Amp, if  $R_f = 100\text{ K}\Omega$ ,  $R_1 = 10\text{ K}\Omega$ ,  $V_{cc} = \pm 10\text{ V}$ ,  $V_i = 2\text{ V}$   
i) Calculate output voltage.  
ii) Is the result in part (i) practically possible? Justify. [5]

OR

**P.T.O.**

- Q4)** a) Explain construction of BJT with respect to area and doping concentration. Mention the types of BJT. [5]
- b) Explain construction and operation of p - channel EMOSFET. [5]
- c) Write ideal and practical values of five parameters of op-Amp. [5]

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Total No. of Questions : 4]

SEAT No. :

**PA-1683**

[Total No. of Pages : 2

**[5931]-1006**

**First Year (Engineering)**

**BASIC ELECTRONICS ENGINEERING**

**(2019 Pattern) (Semester - I) (104010)**

*Time : 1 Hour]*

*[Max. Marks : 30*

*Instructions to the candidates:*

- 1) Attempt Q.1 or Q.2 and Q.3 or Q.4.
- 2) Figures to the right indicate full marks.
- 3) Assume suitable data, wherever necessary.
- 4) Use of electronic pocket calculator is allowed.

**Q1) a)** How electronic components are categorised in active and passive components and compare them. **[5]**

**b)** Draw and explain V-I characteristics of P-M Junction Diode and define these parameters. **[5]**

i) Cut-in Voltage

ii) PIV

iii) Reverse saturation current

**c)** Explain how Zener Diode can be used as voltage regulator. **[5]**

**OR**

**Q2) a)** Explain impact of electronics on industry and society. **[5]**

**b)** Explain working of Bridge Rectifier circuit with the help of wave forms. **[5]**

**c)** Determine the minimum and maximum input voltage for which zener Diode works as voltage regulator, **[5]**

For zener assume

$I_z (\text{min}) = 1 \text{ MA}$

$I_z (\text{max}) 10 \text{ MA}$

$Z_Z = 0-\Omega \quad V_Z = 5\text{V}$

and  $R_L = 1\text{K}\Omega \quad R_s = 470\Omega$

**P.T.O.**

- Q3)** a) Draw output characteristics of BJT in common Emitter configuration. Indicate different operating regions in it. [5]
- b) Draw circuit diagram of single stage E-MOSFET amplifier in common source configuration and explain functions of each component used in it. [5]
- c) Draw and explain functional block diagram of operational amplifier. [5]

OR

- Q4)** a) Draw circuit diagram of single stage BJT amplifier in common emitter configuration and explain function of each components. [5]
- b) Explain working of N-channel E-MOSFET with the help of its construction. [5]
- c) Define following parameters of op-amp and mention their ideal and practical values. [5]
- i) CMRR
  - ii) Input Bias Current
  - iii) Input offset voltage
  - iv) Slew Rate
  - v) PSRR

