DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular/Supplementary Winter Examination – 2024

Course: B.Tech **Branch : Common To All Branches** **Semester : I**

Subject Code & Name: 24AF1000ES106 & Basic Electrical & Electronics Engineering

Max Marks: 60 **Date: 13/02/2025** **Duration: 3 Hr.**

Instructions to the Students:

1. *Each question carries 12 marks.*
2. *Question No. 1 will be compulsory and include objective-type questions.*
3. *Candidates are required to attempt any four questions from Question No. 2 to Question No. 6.*
4. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
5. *Use of non-programmable scientific calculators is allowed.*
6. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	**Objective type questions. (Compulsory Question)**		**12**
1	What is the equivalent resistance when two 4Ω resistors are connected in parallel? A) 2Ω B) 4Ω C) 8Ω D) 1Ω	CO1	1
2	In nodal analysis, the unknown variables are A) Currents in each branch B) Voltage at each node C) Resistance of each branch D) Inductance of each loop	CO3	1
3	In a purely capacitive AC circuit, the current A) Leads the voltage by 90° B) Lags the voltage by 90° C) Is in phase with voltage D) Is zero	CO2	1
4	What is the purpose of back EMF in a DC motor? A) To increase the current in the armature B) To regulate the speed of the motor C) To reduce torque in the motor D) To stop the motor from running	CO1	1
5	The working principle of an induction motor is based on A) Mutual Induction B) Self Induction C) Fleming's Right-Hand Rule D) Static Magnetic Field	CO2	1
6	In a PN junction diode, current conduction in forward bias is mainly due to A) Electrons only B) Holes only C) Both electrons and holes D) Majority carriers only	CO1	1
7	In a DC power supply, the function of a rectifier is to A) Convert AC to DC B) Convert DC to AC C) Convert DC to DC D) Regulate voltage	CO1	1

8	In a Zener diode voltage regulator, the output voltage A) Varies with input voltage B) Remains constant if input voltage is within limits C) Is always equal to input voltage D) Depends on load current only				CO3	1
9	In an NPN transistor, the majority charge carriers in the base are A) Electrons B) Holes C) Both electrons and holes D) Ions				CO2	1
10	The DC load line of a transistor amplifier circuit helps in A) Determining the operating point B) Reducing power consumption C) Increasing gain D) Decreasing leakage current				CO3	1
11	A moving coil instrument operates on the principle of A) Electromagnetic induction B) Electrostatic force C) Magnetic field interaction D) Heating effect of current				CO1	1
12	In a function generator, which parameter cannot be adjusted directly? A) Frequency B) Waveform shape C) Output voltage D) Load resistance				CO2	1
Q.2	**Solve the following.**					**12**
A)	State and explain Kirchhoff's Current Law (KCL) and Kirchhoff's Voltage Law (KVL).				CO1	6
B)	A resistor of 10Ω is connected across a 230V, 50Hz AC supply. Find: (a) The RMS current (b) The power dissipated in the resistor				CO1	6
Q.3	**Solve the following.**					**12**
A)	Define and derive the expression for the RMS (Root Mean Square) value of a sinusoidal waveform.				CO3	6
B)	Define back EMF in a DC motor and derive the torque equation of a DC motor				CO2	6
Q.4	**Solve Any Two of the following.**					**12**
A)	Explain the working of a full-wave bridge rectifier				CO1	6
B)	Explain the function of a capacitor filter in a rectifier circuit.				CO3	6
C)	A full-wave rectifier is supplied with a 230V RMS AC input. If the transformer has a turns ratio of 10:1, calculate: a) The secondary voltage b) The peak output voltage (Assume diode drop = 0.7V)				CO2	6

Q.5	**Solve Any Two of the following.**			**12**
A)	Derive the relationship between current gains (α and β) In Common Base (CB) and Common Emitter (CE) configurations.	CO2		**6**
B)	Explain the construction and working principle of PNP.	CO3		**6**
C)	Explain the construction and working principle of a DC motor.	CO1		**6**
Q.6	**Solve Any Two of the following.**			**12**
A)	Explain the construction and working of a Moving Iron instrument.	CO3		**6**
B)	Draw and explain the block diagram of a digital multimeter.	CO2		**6**
C)	Describe the operation of a function generator.	CO1		**6**

***** End *****

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Bachelor of Technology (Electronics and Computer Engineering) SEMESTER - 2 Summer 2025 (Regular)

Course :Bachelor of Technology (Electronics and Computer Engineering) Branch : Engineering and Technology

Semester : SEMESTER - 2

Subject Code & Name: 24AF1000ES206A - BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

Time : 3 Hours] **[Total Marks : 60**

Instructions to the Students:

1.Each question carries 12 marks.

2.Question No. 1 will be compulsory and include objective-type questions.

3.Candidates are required to attempt any four questions from Question No. 2 to Question No.6

4.Use of non-programmable scientific calculators is allowed.

5.Assume suitable data wherever necessary and mention it clearly.

Q1. Objective type questions. (Compulsory Question) 12

1 Kirchhoff's Current Law is based on the principle of:
a) conservation of voltage
b) conservation of power
c) conservation of energy
d) conservation of charge

2 The average value of a pure sinusoidal voltage over a full cycle is:
a) zero
b) peak value
c) RMS value
d) half of peak value

3 The working of an induction motor is based on:
a) mutual induction between stator and rotor
b) electrostatic interaction
c) back EMF generation
d) direct mechanical coupling

4 The working principle of a DC motor is based on:
a) Faraday's law of electromagnetic induction
b) Lenz's Law
c) Ampere's circuital law
d) Lorentz force on a current-carrying conductor

5 A basic DC power supply includes which of the following blocks?
a) Modulator, Mixer, Amplifier
b) Transformer, Rectifier, Filter, Regulator
c) Oscillator, Comparator, Detector
d) Transmitter, Load, Decoder

6 Zener diode acts as a voltage regulator by:
a) Storing energy in magnetic fields
b) Providing a constant current
c) Maintaining constant voltage despite input or load variations
d) Amplifying input voltage

7 The current gain in common-base (CB) configuration is:
a) Less than 1
b) Greater than 1
c) Equal to 1
d) Infinite

8 The output characteristic of a CE transistor has:
a) A rising slope in saturation region
b) A flat region in active mode
c) A negative slope in cutoff
d) An exponential rise

9 In a Digital Storage Oscilloscope (DSO), the analog signal is first converted into:
a) Square wave
b) Current signal
c) Digital signal using ADC
d) Frequency signal using FFT

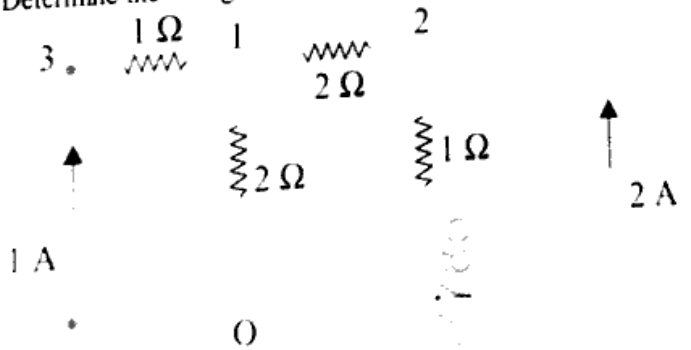
10 A function generator can produce which of the following waveforms?
a) Sine
b) Square
c) Triangle
d) All of the above

11 In which region does a transistor operate when used as an amplifier?
a) Cut-off
b) Saturation
c) Active
d) Breakdown

12 A capacitor in a circuit:
a) Blocks both AC and DC
b) Passes both AC and DC
c) Passes DC and blocks AC
d) Passes AC and blocks DC

Q2. Solve the following. 6

A) Determine the voltages 1 and 2 of the network in Figure by nodal analysis.



6

B) State and explain Kirchhoff's Laws with examples. 6

Q3. Solve the following. 6

A) Describe the construction and working principle of a DC motor. 6

B) Difference between Generator and Motor.

Q4. Solve Any Two of the following. 6

A) With the help of a block diagram, explain the working of a regulated DC power supply. 6

B) Explain the working of a full-wave bridge rectifier with a neat diagram. 6

C) Draw and explain the V-I (voltage-current) characteristics of a PN junction diode.

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a) Less than 1
b) Greater than 1
c) Equal to 1
d) Infinite

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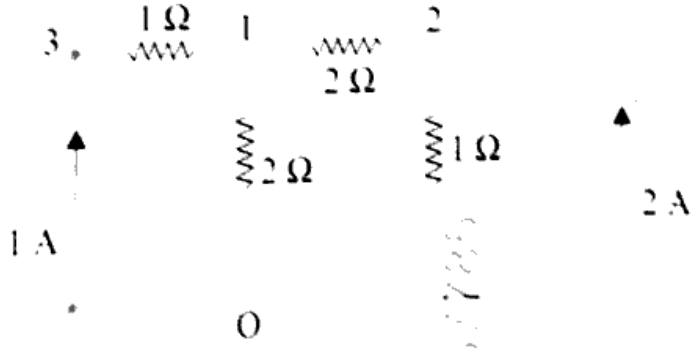

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A) With the help of a block diagram, explain the working of a regulated DC power supply. 6

B) Explain the working of a full-wave bridge rectifier with a neat diagram. 6

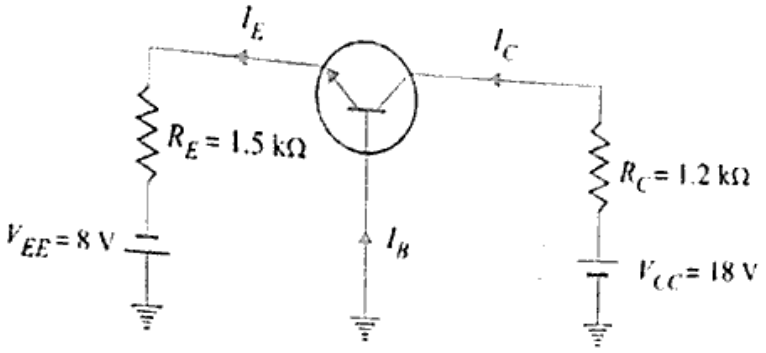
C) Draw and explain the V-I (voltage-current) characteristics of a PN junction diode. 6

Q5. Solve Any Two of the following.

A) Describe the working of a PNP transistor with the help of a circuit diagram. 6

B) With the help of a circuit diagram, explain the operation of a transistor as an amplifier. 6

C) For the common base circuit shown in Figure, determine I_C and V_{CB}. Assume the transistor to be of silicon. 6



Q6. Solve Any Two of the following.

A) Differentiate between Moving Coil and Moving Iron instruments. 6

B) Draw and explain the block diagram of a Digital Storage Oscilloscope (DSO). 6

C) Write a short note on a Function Generator. 6

*** End ***

Dr. Babasaheb Ambedkar Technological University, Lonere-402103

Supplementary Examination December 2018

Course: First year (All branches) **Sem: I/II**

Subject: Basic Electrical Engineering (EE104/EE204) **Max. Marks – 60**

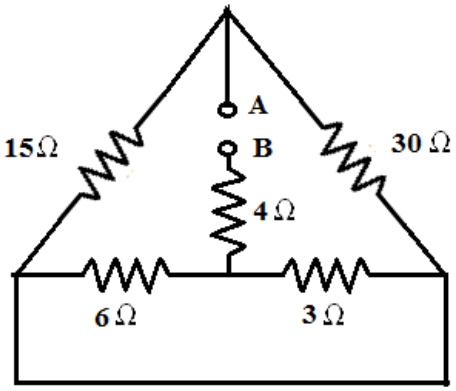
Date – 06/12/2018 **Duration: 03 Hrs.**

Instructions:

- *All Question carry 12 marks.*
- *Attempt any five questions of the following.*
- *Illustrate your answer with neat diagram wherever necessary.*
- *If some part or parameter is noticed to be missing, you may appropriately assume it and mention it clearly.*

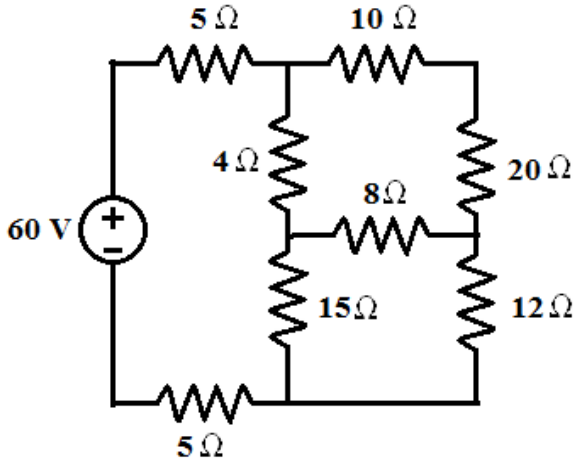
Q 1. a) A copper conductor has its specific resistance of 1.6 x 10^{-6} Ω-cm ºC and a resistance temperature coefficient of 1/254.5 per º C at 20ºC. Find (i) the specific resistance and (ii) the resistance temperature coefficient at 60ºC. (4)

b) Find equivalent resistance between terminal A & B. (4)

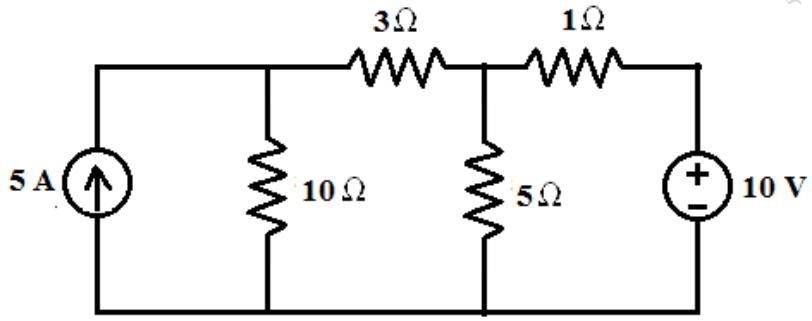


c) Give the definitions for following, (4)
1)Force 2) Work 3) Power 4) Energy

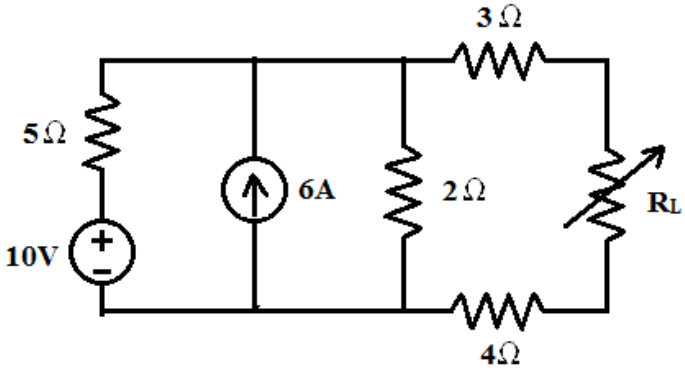
Q 2. a) Find current delivered by battery using star-delta transformation. (4)



b) For the network given below, find current through 3Ω resistor using nodal analysis. (4)



c) Find the value of R_L for which maximum power is transferred through it. Also calculate the power transferred to R_L (4)



Q 3. a) Find the following parameters of a voltage v = 200sin 314t , (4)
1)Frequency 2) Form Factor 3) Crest Factor

b) Find the resultant of following. (4)
i) $e_1 = 25\sin \omega t$ ii) $e_2 = 10 \sin (\omega t + \frac{\pi}{6})$ iii) $e_3 = 30 \cos \omega t$
iv) $e_4 = 20\sin (\omega t - \frac{\pi}{4})$

c) Find the average power in pure capacitive circuit. (4)

Q 4. a) An AC circuit consist of pure resistance and an inductive coil connected in series. The power dissipated in the resistance and the coil are 1000watts and 200 watts respectively. The voltage drop across the resistance and coil are 200V and 300V respectively. (6)
Calculate: i) Value of the resistance ii) Current through circuit iv)Resistance of coil iv)Impedance of coil v) Total impedance of circuit vi) Supply Voltage.

b) Explain with neat circuit resonance in RLC circuit. (6)

Q 5. a) Explain in brief Self induced emf and Mutually induced emf. (6)

b) Define the following terms, (3)
i)Magnetic field ii)Magnetic lines of force iii)Magnetic field strength.

c) An iron ring of mean circumference 80cm is uniformly wound with 1000 turns of wire. Calculate the value of flux density that a current of 1A would produce in ring. Assume relative permeability of an iron to be equal to 1400. (3)

Q 6. a) Derive the EMF equation of transformer. (6)

b) Derive the equation for Energy stored in Capacitor. Also determine the equivalent capacitance of circuit containing a parallel branch of 5uF and 2uF in series with two capacitors of 3uF and 4uF. (6)

------END OF PAPER-----

Dr. Babasaheb Ambedkar Technological University, Lonere-402103

Supplementary Examination December 2018

Course: First year (All branches) **Sem: I/II**

Subject: Basic Electrical Engineering (EE104/EE204) **Max. Marks – 60**

Date – 06/12/2018 **Duration: 03 Hrs.**

Instructions:

- *All Question carry 12 marks.*
- *Attempt any five questions of the following.*
- *Illustrate your answer with neat diagram wherever necessary.*
- *If some part or parameter is noticed to be missing, you may appropriately assume it and mention it clearly.*

Q 1. a) A copper conductor has its specific resistance of 1.6 x 10^{-6} Ω-cm ºC and a resistance temperature coefficient of 1/254.5 per º C at 20ºC. Find (i) the specific resistance and (ii) the resistance temperature coefficient at 60ºC. (4)

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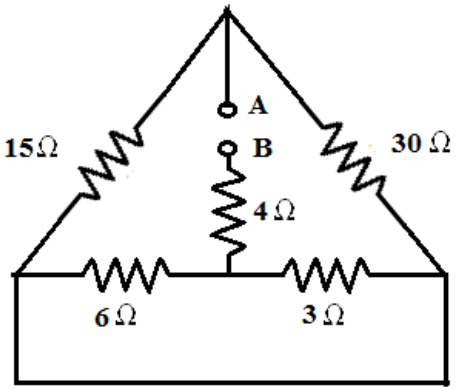

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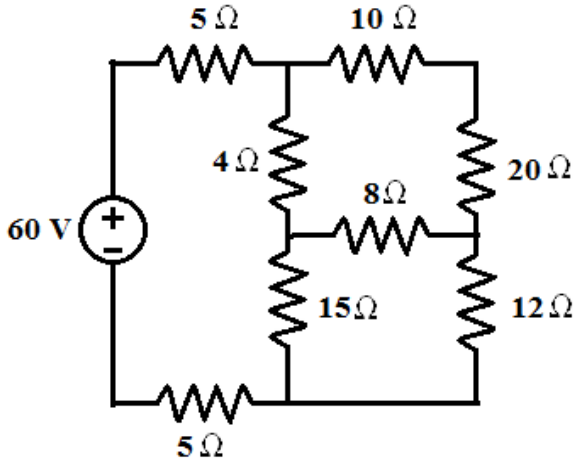

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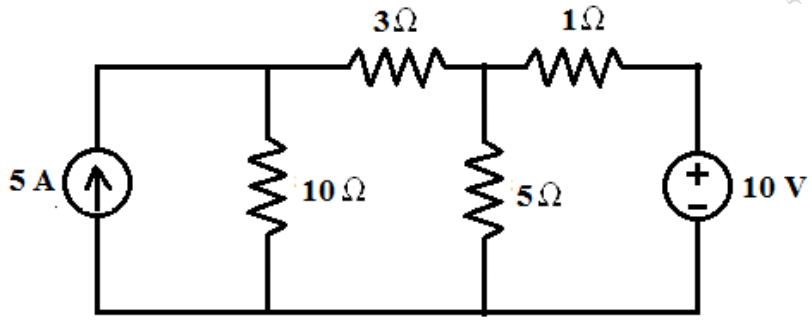
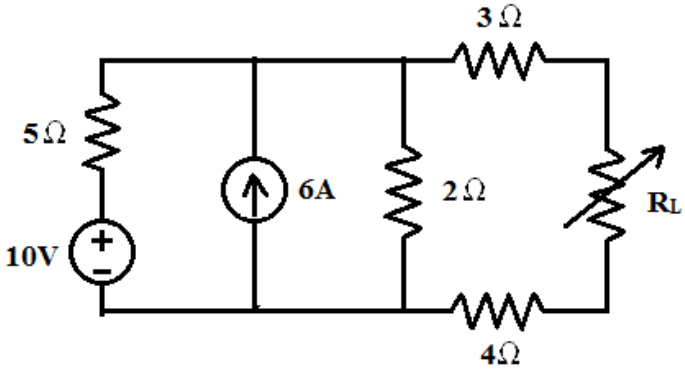


c) Find the value of R_L for which maximum power is transferred through it. Also calculate the power transferred to R_L (4)



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c) Find the average power in pure capacitive circuit. (4)

Q 4. a) An AC circuit consist of pure resistance and an inductive coil connected in series. The power dissipated in the resistance and the coil are 1000watts and 200 watts respectively. The voltage drop across the resistance and coil are 200V and 300V respectively. (6)
Calculate: i) Value of the resistance ii) Current through circuit iv)Resistance of coil iv)Impedance of coil v) Total impedance of circuit vi) Supply Voltage.

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b) Define the following terms, (3)
i)Magnetic field ii)Magnetic lines of force iii)Magnetic field strength.

c) An iron ring of mean circumference 80cm is uniformly wound with 1000 turns of wire. Calculate the value of flux density that a current of 1A would produce in ring. Assume relative permeability of an iron to be equal to 1400. (3)

Q 6. a) Derive the EMF equation of transformer. (6)

b) Derive the equation for Energy stored in Capacitor. Also determine the equivalent capacitance of circuit containing a parallel branch of 5uF and 2uF in series with two capacitors of 3uF and 4uF. (6)

------END OF PAPER-----

Dr. Babasaheb Ambedkar Technological University, Lonere
Summer Examination May-2019

Course: B. Tech. **Semester-I/II**

Subject and Subject Code: Basic Electrical Engineering (EE104/EE204)

Time- 3 Hrs **Date- 06/06/2019** **Max. Marks-60**

Instruction to Students:-

1. **Attempt any FIVE questions from** Question 1 to Question 6.
2. Illustrate your answers with neat sketches, diagrams etc wherever necessary.
3. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly.

Q.1)a) Explain circuit for three resistances connected in parallel with necessary voltage and current relations. **6M**

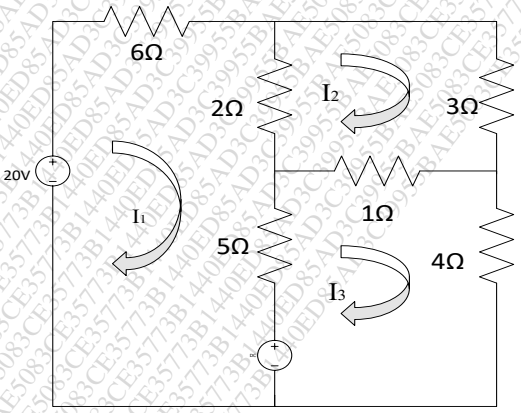
OR

b) Write note on
i) Work ii) Power iii) Energy and give relation between them.

c) A conductor has a cross-section of $10cm^2$ and specific Resistance of 7.5 μΩcm at 0^0c. What will be its Resistance in Ω/km when the temperature is 40^0c ? Take the temperature coefficient of the material = 0.005 per ^{o}c. **6M**

Q.2)a) State and prove Maximum power transfer theorem. **6M**

b) Determine the voltage V which causes the current I_1 to be zero for the circuit shown in the fig. using Mesh analysis.



6M

Q.3)a) Explain AC circuit with pure Capacitance. Derive equations for average and instantaneous power. Also draw Voltage Triangle , Impedance triangle and power triangle for the same circuit. **6M**

b) Find the resultant of the following :

$e_1 = 25 \sin\omega t$, $e_2 = 10 \sin(\omega t + \prod/6)$,

$e_3 = 30 \sin\omega t$, $e_4 = 10 \sin(\omega t - \prod/4)$.

Draw all phasors. **6M**

OR

c) An alternating current of frequency 60 Hz has amax. Value of 12 A.
i) Write down the equation of the instantaneous value.
ii) Find the value of current after 1/360 sec. & iii) Find the time taken to reach 9.6 A for the first time.

Q.4)a) Explain AC circuit with series R-L-C. Draw Voltage Triangle , Impedance triangle and power triangle for the same circuit. **6M**

OR

b) Derive the relation between 3-phase star and delta connected loads.

c) What do you mean by " Resonance"? Explain Series Resonance. **6M**

Q.5)a) State and explain Faraday's law of electromagnetic induction. **6M**

OR

b) Explain the terms i) Statically induced emf ii) Dynamically induced emf.

c) A wire of 50 cm length moves at right angles to its length at 40m/s in a uniform magnetic field of density 1Wb/m^2. Calculate the induced emf in the conductor when the direction of motion is a) perpendicular to the field b) inclined at 30^0 to the direction of the field. **6M**

Q.6)a) Derive the e. m. f equation of single phase tranformer and explain voltage and current ratio of an ideal transformer. **6M**

OR

b) Explain the following types of transformer in detail:-
i) Core type transformer ii) Shell type transformer.

c) A 10 KVA transformer having 50 number of turns on primary and 10 number of turns of secondary is connected to 440 V, 50 Hz, AC supply. Calculate:- **6M**
a) Secondary voltage on No load.
b) Full load primary and secondary current.
c) Maximum value of the flux in core.

END

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE – RAIGAD -402 103

Winter Semester Examination – December - 2019

Branch: B. Tech **Sem.:- I/II**
Subject:-Basic Electrical Engineering [EE 104/EE204] **Marks: 60**
Date:-04/12/2019 **Time:- 3 Hr.**

Instructions to the Students

1. Each question carries 12 marks.
2. Attempt **any five** questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly

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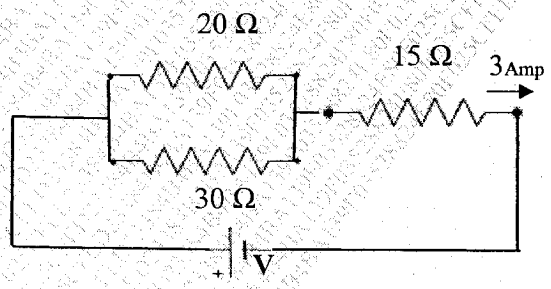
Q1.) **a)** Define the term resistance with its unit. Explain in detail factors on which resistance of metal conductor depends. **6M**

b) The resistance of a wire increases from 18 Ω at 20°C to 20 Ω at 50°C. Find i) The temperature coefficient of resistance at 0°C.ii) The resistance at 65°C. **6M**

Q2.) **a)** State and Explain Kirchhoff's laws. **6M**

b) In the given circuit current flowing through 15 ohm is 3 Amp. **6M**
i) Find the current flowing through 20 ohm and 30 ohm resistor.
ii) Find voltage V.



Q3.) **a)** Explain the R-L series circuit with phasor diagram, when connected to single phase ac supply. **6M**

b) Define the following terms.
1) RMS Value
2) Average Value
3) Form Factor
4) Peak Factor

OR

	b)	A pure inductor of 0.2 H connected across 230 Volt,50 Hz. .i) Find inductive reactance X_L ii) Maximum value of current iii) Find the Expression for current which will flow through inductor.	6M
Q4.)	a)	Explain the following terms for AC circuit with power triangle. i)Apparent power ii)Active power iii)Reactive power	6M
	b)	What is mean by resonance? Explain the RLC series resonance phenomenon in detail.	6M
		OR	
	b)	In a 3 phase Delta connection find the relation between line and phase value of current & voltage. Hence derive equation for power.	6M
Q5.)	a)	Write Comparison Between Magnetic and Electric Circuits.	6M
	b)	A rectangular iron core has a mean length of magnetic path of 100 cm, area of cross-section of 4 cm^2, relative permeability of 1400 and an air-gap of 5 mm cut in the core. The coil has number of turns, N= 600 and carries the current of 4 A. Find the flux in the air-gap.	6M
		OR	
	b)	Define the terms Dynamically, Statically, Self and Mutual induced emf.	6M
Q6.)	a)	State the working principle of a single-phase transformer and derive the EMF equation.	6M
	b)	A single-phase transformer of 800 primary turns and 1300 secondary turns. The primary is connected across 400 volt, 50 Hz. AC supply. Find i) The voltage induced in secondary winding. ii) The maximum value of flux density if the area of cross section is 50 cm^2.	6M
		OR	
	b)	Draw the circuit diagram and derive the equation for charging voltage of a capacitor.	6M

Paper End

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE – RAIGAD -402 103

End Semester Examination Dec-2018

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Branch: B. Tech. (Group A/Group B) **Sem.:- I**

Subject with Subject Code:-Basic Electronics Engineering (EXE105/EXE205)

Date: 11/12/2018 **Marks: 60** **Time:- 3 Hr.**

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Instructions:-

1. **Attempt any *Five* questions.**
2. **All questions carry equal marks.**
3. **Illustrate your answer with neat sketches, diagrams etc. wherever necessary.**
4. **Necessary data is given in the respective questions. If such data is not given, it means that the knowledge of that component is a part of examination.**
5. **If some part or parameter is noticed to be missing, you may appropriately assume and state it clearly in the answer-book.**

Q.1. A] Classify the engineering materials from materials science point of view. 06

B] Compare insulator, semiconductor and conductors. 06

Q.2. Attempt any ***two*** of the followings:

A] Describe the direct and indirect band gap semiconductors. 06

B] The resistivity of Cu is 1.72×10^{-8} ohm- m. Calculate the mobility of electrons in Cu. Given that the number of electrons per unit volume is $10.41 \times 10^{28}/\ m^3$. 06

C] Determine the concentration of conduction electrons in a sample of silicon, if one in every million silicon atom is replaced by a phosphorus atom. Assume every phosphorus atom to be singly ionized. Silicon has a molar mass of 0.028 kg/mole and density of 2300 kg/m^3. 06

Q.3 A] Find the built-in voltage for a Si p-n junction with $N_A = 10^{15} cm^{-3}$ and $N_D = 10^{17} cm^{-3}$ 06

B] Write a note on depletion layer capacitance and diffusion capacitance. 06

Q.4 Define transistor biasing. List and explain different transistor biasing techniques with suitable diagram and expressions. 12

Q.5. Attempt any ***two*** of the followings:

A] Describe the working of bridge rectifier with neat diagram and waveforms. Explain: Peak inverse voltage, ripple factor and efficiency with respect to a center tap full wave rectifier. 06

B] Explain different types of inductors in detail. 06

C] Describe construction and working of a LVDT. State any two advantages and disadvantages of LVDT. 06

Q.6 A] Do as directed: 06

a) Obtain 2's complement of 00111001

b) Add $(AFF.B3)_H$ +$(FFF.E)_H$

c) Determine the floating point representation of $(-142)_{10}$ using IEEE single precision format.

B] What are the Universal Gates? Realize a NAND gate using universal gates. 06

****

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE – RAIGAD -402 103

End Semester Examination Dec-2018

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Branch: B. Tech. (Group A/Group B) **Sem.:- I**

Subject with Subject Code:-Basic Electronics Engineering (EXE105/EXE205)

Date: 11/12/2018 **Marks: 60** **Time:- 3 Hr.**

==========

Instructions:-

1. **Attempt any *Five* questions.**
2. **All questions carry equal marks.**
3. **Illustrate your answer with neat sketches, diagrams etc. wherever necessary.**
4. **Necessary data is given in the respective questions. If such data is not given, it means that the knowledge of that component is a part of examination.**
5. **If some part or parameter is noticed to be missing, you may appropriately assume and state it clearly in the answer-book.**

Q.1. A] Classify the engineering materials from materials science point of view. 06

B] Compare insulator, semiconductor and conductors. 06

Q.2. Attempt any ***two*** of the followings:

A] Describe the direct and indirect band gap semiconductors. 06

B] The resistivity of Cu is 1.72×10^{-8} ohm- m. Calculate the mobility of electrons in Cu. Given that the number of electrons per unit volume is $10.41 \times 10^{28}/\ m^3$. 06

C] Determine the concentration of conduction electrons in a sample of silicon, if one in every million silicon atom is replaced by a phosphorus atom. Assume every phosphorus atom to be singly ionized. Silicon has a molar mass of 0.028 kg/mole and density of 2300 kg/m^3. 06

Q.3 A] Find the built-in voltage for a Si p-n junction with $N_A = 10^{15} cm^{-3}$ and $N_D = 10^{17} cm^{-3}$ 06

B] Write a note on depletion layer capacitance and diffusion capacitance. 06

Q.4 Define transistor biasing. List and explain different transistor biasing techniques with suitable diagram and expressions. 12

Q.5. Attempt any ***two*** of the followings:

A] Describe the working of bridge rectifier with neat diagram and waveforms. Explain: Peak inverse voltage, ripple factor and efficiency with respect to a center tap full wave rectifier. 06

B] Explain different types of inductors in detail. 06

C] Describe construction and working of a LVDT. State any two advantages and disadvantages of LVDT. 06

Q.6 A] Do as directed: 06

a) Obtain 2's complement of 00111001

b) Add $(AFF.B3)_H$ +$(FFF.E)_H$

c) Determine the floating point representation of $(-142)_{10}$ using IEEE single precision format.

B] What are the Universal Gates? Realize a NAND gate using universal gates. 06

****

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE – RAIGAD

Semester Examination – June - 2019

Branch: Electronics & Telecommunication Engg. Sem.:- I & II

Subject with Subject Code: Basic Electronics engineering (EXE105/EX205)

Marks: 60 Date: 08-06-2019 Time: 3 Hrs.

Instructions to the Students

1. Each question carries 12 marks.
2. Attempt **any five** questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly

Q.1 A Explain classification of materials from electrical engineering point of view with example. (6)

B What are different types of bonding? Explain with an example. (6)

Q.2 A What is doping? What is N-type material and P-type material? (6)

B Explain Hall effect with suitable diagram. Derive equation for hall coefficient? (6)

Q.3 A What is clipper? Explain operation of positive clipper with the help of suitable diagram. (6)

B For a full wave rectifier derive the expression for (6)

a. I_{dc} b.P_{dc}

Q.4 A What are different types of resistor? What is color code for 1K resistor? (6)

B What is capacitor? Explain different types of capacitor. (6)

Q.5 A What is ohmmeter? Explain working of ohmmeter with suitable example. (6)

B How temperature is measured using thermistor? Explain Advantages and Disadvantages of thermistor. (6)

Q6 A Convert the following numbers to decimal (6)

a. $(555)_8$ b.$(1FFF)_{16}$

B What are universal gates? Implement basic gates using universal gates. (6)

********************All the Best*********************

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY
LONERE – RAIGAD -402 103
Winter End Semester Examination: Dec. 2019

Branch: B. Tech. **Sem.:- I/II**

Subject:- Basic Electronics Engineering (EXE105/EXE205) **Marks: 60**

Date:- 06/12/2019 **Time:- 3 Hr.**

Instructions:-

1. **Attempt any *Five* questions.**
2. **All questions carry equal marks.**
3. **Illustrate your answer with neat sketches, diagrams etc. wherever necessary.**
4. **Necessary data is given in the respective questions. If such data is not given, it means that the knowledge of that component is a part of examination.**
5. **If some part or parameter is noticed to be missing, you may appropriately assume and state it clearly in the answer-book.**

Q.1. A] Describe essential features of the following bonds: 06
(a) Ionic bond
(b) Covalent bond
(c) Metallic bond

B] Explain the classification of materials with electrical engineering point of view. 06

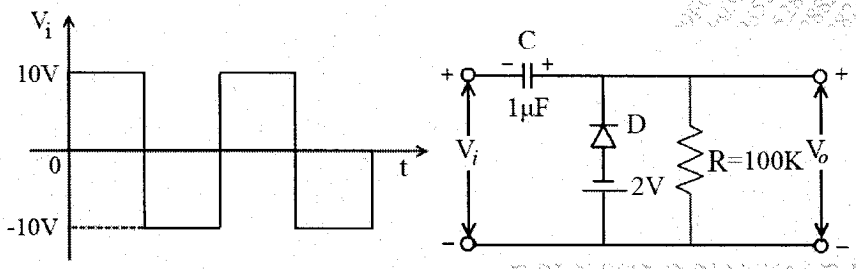
Q.2. Attempt any ***two*** of the followings:

A] How does the Fermi level changes with increasing temperature in the extrinsic semiconductors (***n***- type and ***p*** -type)? Sketch the energy level diagram. 06

B] What is Hall effect? Calculate Hall voltage, Hall coefficient and Hall angle. 06

C] Find the built-in voltage for a ***Si*** P-N junction with $N_A = 10^{15} cm^{-3}$ and $N_D = 10^{17} cm^{-3}$ at room temperature with $n_i = 10^{10} cm^{-3}$. 06

Q.3 A] Sketch V_o for the circuit and the input shown. ***D*** is a silicone diode with cut in voltage $V_v = 0.6V$. 06



B] Write a note on depletion layer capacitance and diffusion capacitance. 06

Q.4 Define transistor biasing. List and explain different transistor biasing techniques with suitable diagram and expressions. 12

Q.5. Attempt any ***two*** of the followings:

A] Describe the working of center tap full wave rectifier with neat diagram and waveforms. Explain: Peak inverse voltage, ripple factor and efficiency with respect to a center tap full wave rectifier. 06

B] Explain different types of resistors in detail. What is the color code for 1KΩ resistor? 06

C] Describe construction and working of a LVDT. State any two advantages and disadvantages of LVDT. 06

Q.6 A] Do as directed: 06

a) Obtain 2's complement of 10111011

b) Add $(AF1.B3)_H + (FFF.E)_H$

c) Determine the floating point representation of $(-142)_{10}$ using IEEE single precision format.

B] Explain AND, OR, NAND, NOR, Ex-OR, Ex-NOR logic gates with their logic diagram and truth table. 06

********PAPER END*******

SLR-TX – 15

Seat No.	

Set **P**

F.E. (Part – II) (New CBCS) Examination, 2018
BASIC ELECTRONICS

Day and Date : Thursday, 22-11-2018 Total Marks : 35
Time : 10.00 a.m. to 12.00 noon

Instructions *:* *1)* ***All*** *questions are* ***compulsory****.*
2) Assume suitable data ***if*** *required.*
3) Figures to the ***right*** *indicate maximum marks.*
4) Q. No. ***1*** *is* ***compulsory****. It should be solved in* ***first 15 minutes*** *in Answer Book Page No.* ***3****.* ***Each*** *question carries* ***one*** *mark.*
5) ***Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.***

MCQ/Objective Type Questions

Duration : 15 Minutes Marks : 7

1. Choose the correct answer :

1) A pentavalent impurity has _____ valence electrons.
   a) 3
   b) 5
   c) 4
   d) 6

2) A Zener diode is used as
   a) An amplifier
   b) A transducer
   c) A voltage regulator
   d) A multivibrator

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

P.T.O.

4) A transistor has
   a) One PN junction
   b) Two PN junction
   c) Three PN junction
   d) Four PN junction

5) In a transistor
   a) $I_C = I_E + I_B$
   b) $I_E = I_C - I_B$
   c) $I_B = I_C + I_E$
   d) $I_E = I_C + I_B$

6) Thermocouple is a _____ transducer and used for measurement of
   a) Passive, Temperature
   b) Active, Light sensitivity
   c) Active, Displacement
   d) Active, Temperature

7) The binary number 10101 is equivalent to decimal number
   a) 19
   b) 12
   c) 27
   d) 21

_____

SLR-TX – 15

Seat No.	

F.E. (Part – II) (New CBCS) Examination, 2018
BASIC ELECTRONICS

Day and Date : Thursday, 22-11-2018 Marks : 28
Time : 10.00 a.m. to 12.00 noon

***Instructions** : 1) **All** questions are **compulsory**.*
*2) Figures to the **right** indicate **full** marks.*
*3) Assume suitable data **if** required.*

SECTION – I

2. Attempt **any two** : **(2×3=6)**

1) Explain capacitor filter for bridge rectifier with suitable circuit diagram and waveforms.

2) Explain application of transistor as a switch.

3) Explain difference between half wave and full wave rectifier with circuit diagram and waveforms.

3. Attempt **any two** : **(2×4=8)**

1) Explain zener as a voltage regulator with neat diagram.

2) Explain input and output characteristics of common base configuration of transistor.

3) Draw and explain common anode LED display along with truth table.

SECTION – II

4. Attempt **any two** : **(2×3=6)**

1) State and prove De-Morgan's theorem.

2) Briefly explain the principle of operation of LVDT with suitable diagram.

3) Simplify the following Boolean expression
$A\overline{B} + AB\overline{C} + ABCD + ABC\overline{D}$

Set P

5. Attempt **any two** : **(2×4=8)**

   1) Realize basic gates using universal gates.

   2) Perform following subtraction using 2's complement method and represent the result in octal number system.
      i) $(756)_8 - (637)_8$
      ii) $(10011)_2 - (10001)_2$

   3) Write a short note on the following :
      a) Thermistor
      b) LDR.

_____

Set P

SLR-TX – 15

Seat No.	

Set Q

F.E. (Part – II) (New CBCS) Examination, 2018
BASIC ELECTRONICS

Day and Date : Thursday, 22-11-2018 Total Marks : 35
Time : 10.00 a.m. to 12.00 noon

Instructions *:* 1) ***All*** *questions are* ***compulsory****.*
2) *Assume suitable data* ***if*** *required.*
3) *Figures to the* ***right*** *indicate maximum marks.*
4) *Q. No.* ***1*** *is* ***compulsory****. It should be solved in* ***first 15 minutes*** *in Answer Book Page No.* ***3****.* ***Each*** *question carries* ***one*** *mark.*
5) ***Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.***

MCQ/Objective Type Questions

Duration : 15 Minutes Marks : 7

1. Choose the correct answer :

1) A transistor has
   a) One PN junction
   b) Two PN junction
   c) Three PN junction
   d) Four PN junction

2) In a transistor
   a) $I_C = I_E + I_B$
   b) $I_E = I_C - I_B$
   c) $I_B = I_C + I_E$
   d) $I_E = I_C + I_B$

3) Thermocouple is a _____ transducer and used for measurement of
   a) Passive, Temperature
   b) Active, Light sensitivity
   c) Active, Displacement
   d) Active, Temperature

P.T.O.

4) The binary number 10101 is equivalent to decimal number
   a) 19
   b) 12
   c) 27
   d) 21

5) A pentavalent impurity has _____ valence electrons.
   a) 3
   b) 5
   c) 4
   d) 6

6) A Zener diode is used as
   a) An amplifier
   b) A transducer
   c) A voltage regulator
   d) A multivibrator

7) The maximum efficiency of half wave rectifier is
   a) 40.6%
   b) 81.2%
   c) 50%
   d) 25%

_____

SLR-TX – 15

Seat No.	

F.E. (Part – II) (New CBCS) Examination, 2018
BASIC ELECTRONICS

Day and Date : Thursday, 22-11-2018 Marks : 28
Time : 10.00 a.m. to 12.00 noon

***Instructions** : 1) **All** questions are **compulsory**.*
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SECTION – I

2. Attempt **any two** : **(2×3=6)**
   1) Explain capacitor filter for bridge rectifier with suitable circuit diagram and waveforms.
   2) Explain application of transistor as a switch.
   3) Explain difference between half wave and full wave rectifier with circuit diagram and waveforms.

3. Attempt **any two** : **(2×4=8)**
   1) Explain zener as a voltage regulator with neat diagram.
   2) Explain input and output characteristics of common base configuration of transistor.
   3) Draw and explain common anode LED display along with truth table.

SECTION – II

4. Attempt **any two** : **(2×3=6)**
   1) State and prove De-Morgan's theorem.
   2) Briefly explain the principle of operation of LVDT with suitable diagram.
   3) Simplify the following Boolean expression
   $A\overline{B} + AB\overline{C} + ABCD + ABC\overline{D}$

Set Q

5. Attempt **any two** : **(2×4=8)**

   1) Realize basic gates using universal gates.

   2) Perform following subtraction using 2's complement method and represent the result in octal number system.
      i) $(756)_8 - (637)_8$
      ii) $(10011)_2 - (10001)_2$

   3) Write a short note on the following :
      a) Thermistor
      b) LDR.

_____

Set Q

SLR-TX – 15

Seat No.	

Set **R**

F.E. (Part – II) (New CBCS) Examination, 2018
BASIC ELECTRONICS

Day and Date : Thursday, 22-11-2018 Total Marks : 35
Time : 10.00 a.m. to 12.00 noon

Instructions *:* *1)* ***All*** *questions are* ***compulsory****.*
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MCQ/Objective Type Questions

Duration : 15 Minutes Marks : 7

1. Choose the correct answer :

1) Thermocouple is a _____ transducer and used for measurement of
   a) Passive, Temperature
   b) Active, Light sensitivity
   c) Active, Displacement
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2) The binary number 10101 is equivalent to decimal number
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3) A pentavalent impurity has _____ valence electrons.
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P.T.O.

4) A Zener diode is used as
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   b) A transducer
   c) A voltage regulator
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7) In a transistor
   a) $I_C = I_E + I_B$
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SLR-TX – 15

Seat No.	

F.E. (Part – II) (New CBCS) Examination, 2018
BASIC ELECTRONICS

Day and Date : Thursday, 22-11-2018 Marks : 28
Time : 10.00 a.m. to 12.00 noon

***Instructions** : 1) **All** questions are **compulsory**.*
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SECTION – I

2. Attempt **any two** : **(2×3=6)**
   1) Explain capacitor filter for bridge rectifier with suitable circuit diagram and waveforms.
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3. Attempt **any two** : **(2×4=8)**
   1) Explain zener as a voltage regulator with neat diagram.
   2) Explain input and output characteristics of common base configuration of transistor.
   3) Draw and explain common anode LED display along with truth table.

SECTION – II

4. Attempt **any two** : **(2×3=6)**
   1) State and prove De-Morgan's theorem.
   2) Briefly explain the principle of operation of LVDT with suitable diagram.
   3) Simplify the following Boolean expression
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Set R

5. Attempt **any two** : **(2×4=8)**

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   2) Perform following subtraction using 2's complement method and represent the result in octal number system.
      i) $(756)_8 - (637)_8$
      ii) $(10011)_2 - (10001)_2$

   3) Write a short note on the following :
      a) Thermistor
      b) LDR.

_____

Set R

SLR-TX – 15

Seat No.	

Set S

F.E. (Part – II) (New CBCS) Examination, 2018
BASIC ELECTRONICS

Day and Date : Thursday, 22-11-2018 Total Marks : 35
Time : 10.00 a.m. to 12.00 noon

Instructions *:* 1) ***All*** *questions are* ***compulsory****.*
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MCQ/Objective Type Questions

Duration : 15 Minutes Marks : 7

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1) The maximum efficiency of half wave rectifier is
   a) 40.6%
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   d) 25%

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P.T.O.

4) Thermocouple is a _____ transducer and used for measurement of
   a) Passive, Temperature
   b) Active, Light sensitivity
   c) Active, Displacement
   d) Active, Temperature

5) The binary number 10101 is equivalent to decimal number
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   a) An amplifier
   b) A transducer
   c) A voltage regulator
   d) A multivibrator

_____

SLR-TX – 15

Seat No.	

F.E. (Part – II) (New CBCS) Examination, 2018
BASIC ELECTRONICS

Day and Date : Thursday, 22-11-2018 Marks : 28
Time : 10.00 a.m. to 12.00 noon

***Instructions** : 1) **All** questions are **compulsory**.*
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SECTION – I

2. Attempt **any two** : **(2×3=6)**
   1) Explain capacitor filter for bridge rectifier with suitable circuit diagram and waveforms.
   2) Explain application of transistor as a switch.
   3) Explain difference between half wave and full wave rectifier with circuit diagram and waveforms.

3. Attempt **any two** : **(2×4=8)**
   1) Explain zener as a voltage regulator with neat diagram.
   2) Explain input and output characteristics of common base configuration of transistor.
   3) Draw and explain common anode LED display along with truth table.

SECTION – II

4. Attempt **any two** : **(2×3=6)**
   1) State and prove De-Morgan's theorem.
   2) Briefly explain the principle of operation of LVDT with suitable diagram.
   3) Simplify the following Boolean expression
   $A\overline{B} + AB\overline{C} + ABCD + ABC\overline{D}$

Set S

5. Attempt **any two** : **(2×4=8)**

   1) Realize basic gates using universal gates.

   2) Perform following subtraction using 2's complement method and represent the result in octal number system.
      i) $(756)_8 - (637)_8$
      ii) $(10011)_2 - (10001)_2$

   3) Write a short note on the following :
      a) Thermistor
      b) LDR.

_____

Dr. Babasaheb Ambedkar Technological University, Lonere-402103

Supplementary Examination December 2018

Course: First year (All branches) **Sem: I/II**

Subject: Basic Electrical Engineering (EE104/EE204) **Max. Marks – 60**

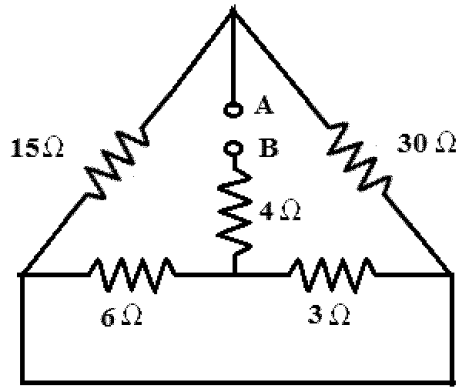
Date – 06/12/2018 **Duration: 03 Hrs.**

Instructions:

- *All Question carry 12 marks.*
- *Attempt any five questions of the following.*
- *Illustrate your answer with neat diagram wherever necessary.*
- *If some part or parameter is noticed to be missing, you may appropriately assume it and mention it clearly.*

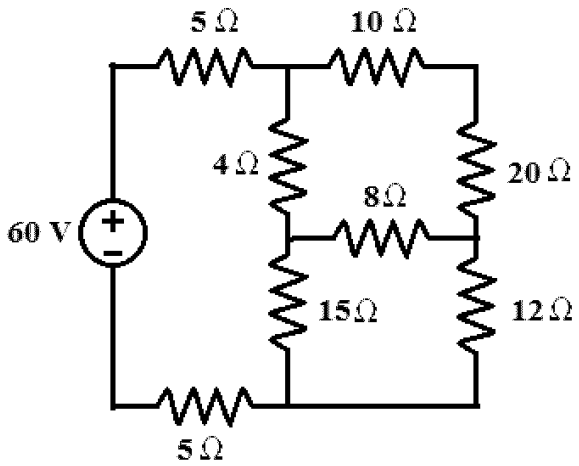
Q 1. a) A copper conductor has its specific resistance of 1.6×10^{-6} Ω-cm ºC and a resistance temperature coefficient of 1/254.5 per º C at 20ºC. Find (i) the specific resistance and (ii) the resistance temperature coefficient at 60ºC. (4)

b) Find equivalent resistance between terminal A & B. (4)

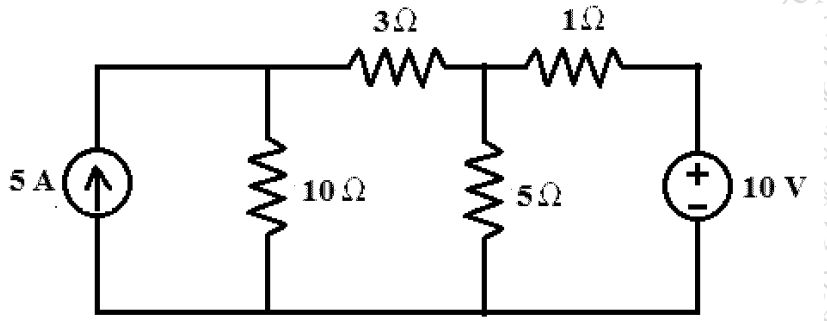


c) Give the definitions for following, (4)
1)Force 2) Work 3) Power 4) Energy

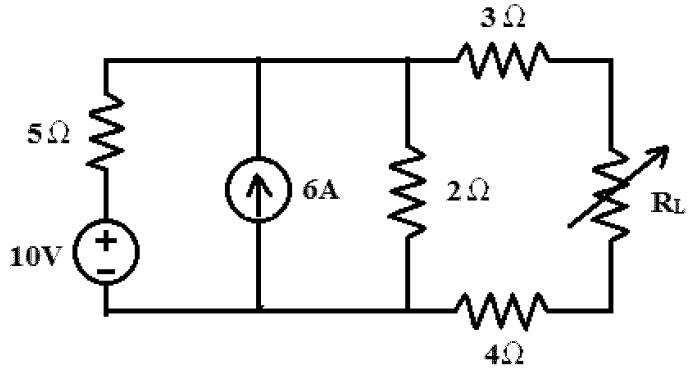
Q 2. a) Find current delivered by battery using star-delta transformation. (4)



b) For the network given below, find current through 3Ω resistor using nodal analysis. (4)



c) Find the value of R_L for which maximum power is transferred through it. Also calculate the power transferred to R_L (4)



Q 3. a) Find the following parameters of a voltage v = 200sin 314t , (4)
1)Frequency 2) Form Factor 3) Crest Factor

b) Find the resultant of following. (4)
i) $e_1 = 25\sin \omega t$ ii) $e_2 = 10 \sin (\omega t + \frac{\pi}{6})$ iii) $e_3 = 30 \cos \omega t$
iv) $e_4 = 20\sin (\omega t - \frac{\pi}{4})$

c) Find the average power in pure capacitive circuit. (4)

Q 4. a) An AC circuit consist of pure resistance and an inductive coil connected in series. The power dissipated in the resistance and the coil are 1000watts and 200 watts respectively. The voltage drop across the resistance and coil are 200V and 300V respectively. (6)
Calculate: i) Value of the resistance ii) Current through circuit iv)Resistance of coil iv)Impedance of coil v) Total impedance of circuit vi) Supply Voltage.

b) Explain with neat circuit resonance in RLC circuit. (6)

Q 5. a) Explain in brief Self induced emf and Mutually induced emf. (6)

b) Define the following terms, (3)
i)Magnetic field ii)Magnetic lines of force iii)Magnetic field strength.

c) An iron ring of mean circumference 80cm is uniformly wound with 1000 turns of wire. Calculate the value of flux density that a current of 1A would produce in ring. Assume relative permeability of an iron to be equal to 1400. (3)

Q 6. a) Derive the EMF equation of transformer. (6)

b) Derive the equation for Energy stored in Capacitor. Also determine the equivalent capacitance of circuit containing a parallel branch of 5uF and 2uF in series with two capacitors of 3uF and 4uF. (6)

------END OF PAPER-----

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular/Supplementary Winter Examination – 2024

Course: B.Tech **Branch : Common To All Branches** **Semester : I**

Subject Code & Name: 24AF1000ES106 & Basic Electrical & Electronics Engineering

Max Marks: 60 **Date: 13/02/2025** **Duration: 3 Hr.**

Instructions to the Students:

1. *Each question carries 12 marks.*
2. *Question No. 1 will be compulsory and include objective-type questions.*
3. *Candidates are required to attempt any four questions from Question No. 2 to Question No. 6.*
4. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
5. *Use of non-programmable scientific calculators is allowed.*
6. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	**Objective type questions. (Compulsory Question)**		**12**
1	What is the equivalent resistance when two 4Ω resistors are connected in parallel? A) 2Ω B) 4Ω C) 8Ω D) 1Ω	CO1	1
2	In nodal analysis, the unknown variables are A) Currents in each branch B) Voltage at each node C) Resistance of each branch D) Inductance of each loop	CO3	1
3	In a purely capacitive AC circuit, the current A) Leads the voltage by 90° B) Lags the voltage by 90° C) Is in phase with voltage D) Is zero	CO2	1
4	What is the purpose of back EMF in a DC motor? A) To increase the current in the armature B) To regulate the speed of the motor C) To reduce torque in the motor D) To stop the motor from running	CO1	1
5	The working principle of an induction motor is based on A) Mutual Induction B) Self Induction C) Fleming's Right-Hand Rule D) Static Magnetic Field	CO2	1
6	In a PN junction diode, current conduction in forward bias is mainly due to A) Electrons only B) Holes only C) Both electrons and holes D) Majority carriers only	CO1	1
7	In a DC power supply, the function of a rectifier is to A) Convert AC to DC B) Convert DC to AC C) Convert DC to DC D) Regulate voltage	CO1	1

8	In a Zener diode voltage regulator, the output voltage A) Varies with input voltage B) Remains constant if input voltage is within limits C) Is always equal to input voltage D) Depends on load current only				CO3	1
9	In an NPN transistor, the majority charge carriers in the base are A) Electrons B) Holes C) Both electrons and holes D) Ions				CO2	1
10	The DC load line of a transistor amplifier circuit helps in A) Determining the operating point B) Reducing power consumption C) Increasing gain D) Decreasing leakage current				CO3	1
11	A moving coil instrument operates on the principle of A) Electromagnetic induction B) Electrostatic force C) Magnetic field interaction D) Heating effect of current				CO1	1
12	In a function generator, which parameter cannot be adjusted directly? A) Frequency B) Waveform shape C) Output voltage D) Load resistance				CO2	1
Q.2	**Solve the following.**					**12**
A)	State and explain Kirchhoff's Current Law (KCL) and Kirchhoff's Voltage Law (KVL).				CO1	6
B)	A resistor of 10Ω is connected across a 230V, 50Hz AC supply. Find: (a) The RMS current (b) The power dissipated in the resistor				CO1	6
Q.3	**Solve the following.**					**12**
A)	Define and derive the expression for the RMS (Root Mean Square) value of a sinusoidal waveform.				CO3	6
B)	Define back EMF in a DC motor and derive the torque equation of a DC motor				CO2	6
Q.4	**Solve Any Two of the following.**					**12**
A)	Explain the working of a full-wave bridge rectifier				CO1	6
B)	Explain the function of a capacitor filter in a rectifier circuit.				CO3	6
C)	A full-wave rectifier is supplied with a 230V RMS AC input. If the transformer has a turns ratio of 10:1, calculate: a) The secondary voltage b) The peak output voltage (Assume diode drop = 0.7V)				CO2	6

Q.5	**Solve Any Two of the following.**			**12**
A)	Derive the relationship between current gains (α and β) In Common Base (CB) and Common Emitter (CE) configurations.	CO2		**6**
B)	Explain the construction and working principle of PNP.	CO3		**6**
C)	Explain the construction and working principle of a DC motor.	CO1		**6**
Q.6	**Solve Any Two of the following.**			**12**
A)	Explain the construction and working of a Moving Iron instrument.	CO3		**6**
B)	Draw and explain the block diagram of a digital multimeter.	CO2		**6**
C)	Describe the operation of a function generator.	CO1		**6**

***** End *****

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Bachelor of Technology (Electronics and Computer Engineering) SEMESTER - 2 Summer 2025 (Regular)

Course :Bachelor of Technology (Electronics and Computer Engineering) Branch : Engineering and Technology

Semester : SEMESTER - 2

Subject Code & Name: 24AF1000ES206A - BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

Time : 3 Hours] **[Total Marks : 60**

Instructions to the Students:

1.Each question carries 12 marks.

2.Question No. 1 will be compulsory and include objective-type questions.

3.Candidates are required to attempt any four questions from Question No. 2 to Question No.6

4.Use of non-programmable scientific calculators is allowed.

5.Assume suitable data wherever necessary and mention it clearly.

Q1. Objective type questions. (Compulsory Question) 12

1 Kirchhoff's Current Law is based on the principle of:
a) conservation of voltage
b) conservation of power
c) conservation of energy
d) conservation of charge

2 The average value of a pure sinusoidal voltage over a full cycle is:
a) zero
b) peak value
c) RMS value
d) half of peak value

3 The working of an induction motor is based on:
a) mutual induction between stator and rotor
b) electrostatic interaction
c) back EMF generation
d) direct mechanical coupling

4 The working principle of a DC motor is based on:
a) Faraday's law of electromagnetic induction
b) Lenz's Law
c) Ampere's circuital law
d) Lorentz force on a current-carrying conductor

5 A basic DC power supply includes which of the following blocks?
a) Modulator, Mixer, Amplifier
b) Transformer, Rectifier, Filter, Regulator
c) Oscillator, Comparator, Detector
d) Transmitter, Load, Decoder

6 Zener diode acts as a voltage regulator by:
a) Storing energy in magnetic fields
b) Providing a constant current
c) Maintaining constant voltage despite input or load variations
d) Amplifying input voltage

7 The current gain in common-base (CB) configuration is:
a) Less than 1
b) Greater than 1
c) Equal to 1
d) Infinite

8 The output characteristic of a CE transistor has:
a) A rising slope in saturation region
b) A flat region in active mode
c) A negative slope in cutoff
d) An exponential rise

9 In a Digital Storage Oscilloscope (DSO), the analog signal is first converted into:
a) Square wave
b) Current signal
c) Digital signal using ADC
d) Frequency signal using FFT

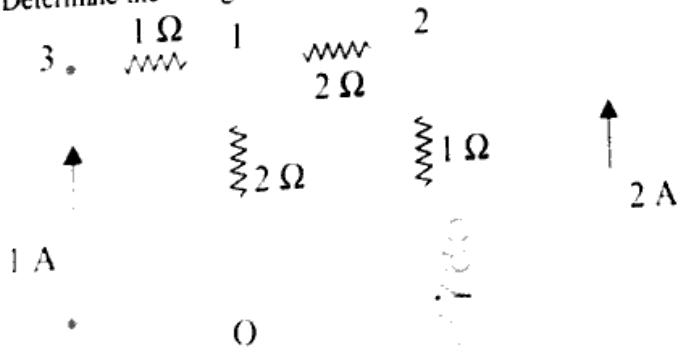
10 A function generator can produce which of the following waveforms?
a) Sine
b) Square
c) Triangle
d) All of the above

11 In which region does a transistor operate when used as an amplifier?
a) Cut-off
b) Saturation
c) Active
d) Breakdown

12 A capacitor in a circuit:
a) Blocks both AC and DC
b) Passes both AC and DC
c) Passes DC and blocks AC
d) Passes AC and blocks DC

Q2. Solve the following. 6

A) Determine the voltages 1 and 2 of the network in Figure by nodal analysis.



6

B) State and explain Kirchhoff's Laws with examples. 6

Q3. Solve the following. 6

A) Describe the construction and working principle of a DC motor. 6

B) Difference between Generator and Motor.

Q4. Solve Any Two of the following. 6

A) With the help of a block diagram, explain the working of a regulated DC power supply. 6

B) Explain the working of a full-wave bridge rectifier with a neat diagram. 6

C) Draw and explain the V-I (voltage-current) characteristics of a PN junction diode.

7 The current gain in common-base (CB) configuration is
a) Less than 1
b) Greater than 1
c) Equal to 1
d) Infinite

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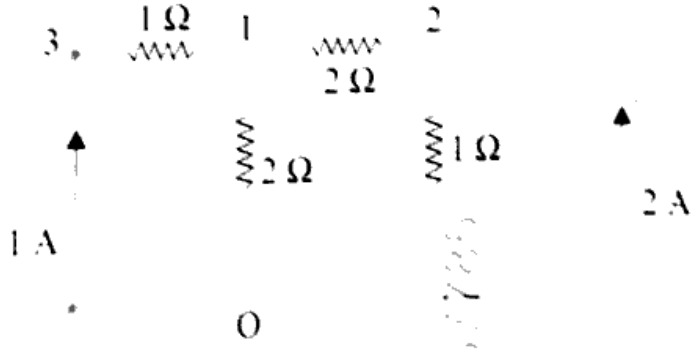

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A) With the help of a block diagram, explain the working of a regulated DC power supply. 6

B) Explain the working of a full-wave bridge rectifier with a neat diagram. 6

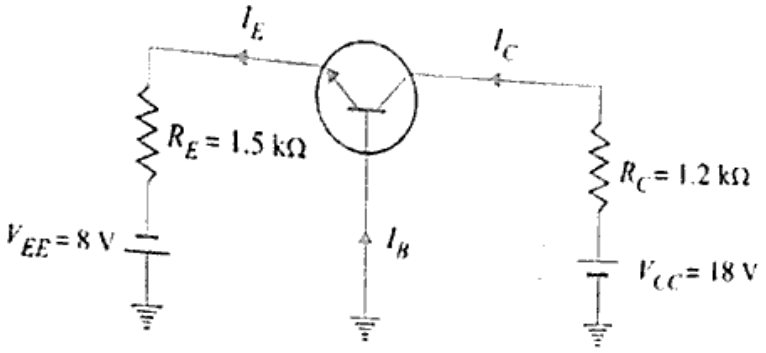
C) Draw and explain the V-I (voltage-current) characteristics of a PN junction diode. 6

Q5. Solve Any Two of the following.

A) Describe the working of a PNP transistor with the help of a circuit diagram. 6

B) With the help of a circuit diagram, explain the operation of a transistor as an amplifier. 6

C) For the common base circuit shown in Figure, determine I_C and V_{CB}. Assume the transistor to be of silicon. 6



Q6. Solve Any Two of the following.

A) Differentiate between Moving Coil and Moving Iron instruments. 6

B) Draw and explain the block diagram of a Digital Storage Oscilloscope (DSO). 6

C) Write a short note on a Function Generator. 6

*** End ***

Dr. Babasaheb Ambedkar Technological University, Lonere-402103

Supplementary Examination December 2018

Course: First year (All branches) **Sem: I/II**

Subject: Basic Electrical Engineering (EE104/EE204) **Max. Marks – 60**

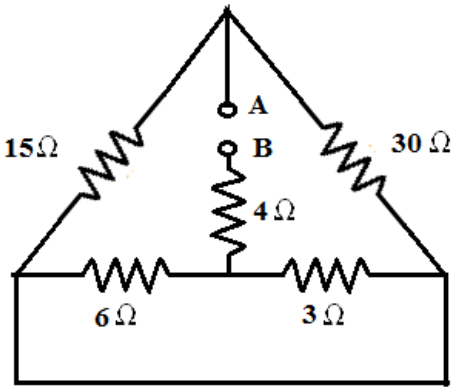
Date – 06/12/2018 **Duration: 03 Hrs.**

Instructions:

- *All Question carry 12 marks.*
- *Attempt any five questions of the following.*
- *Illustrate your answer with neat diagram wherever necessary.*
- *If some part or parameter is noticed to be missing, you may appropriately assume it and mention it clearly.*

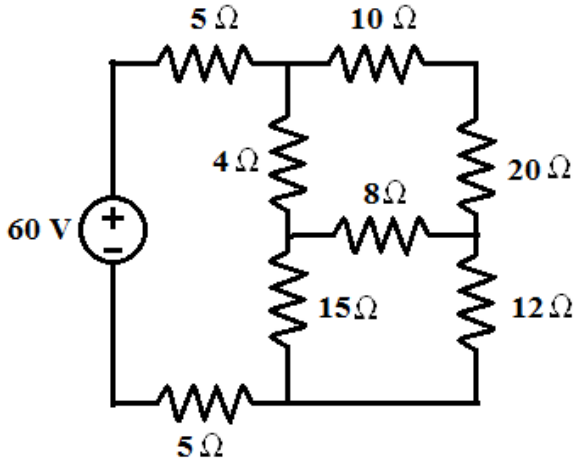
Q 1. a) A copper conductor has its specific resistance of 1.6 x 10^{-6} Ω-cm ºC and a resistance temperature coefficient of 1/254.5 per º C at 20ºC. Find (i) the specific resistance and (ii) the resistance temperature coefficient at 60ºC. (4)

b) Find equivalent resistance between terminal A & B. (4)

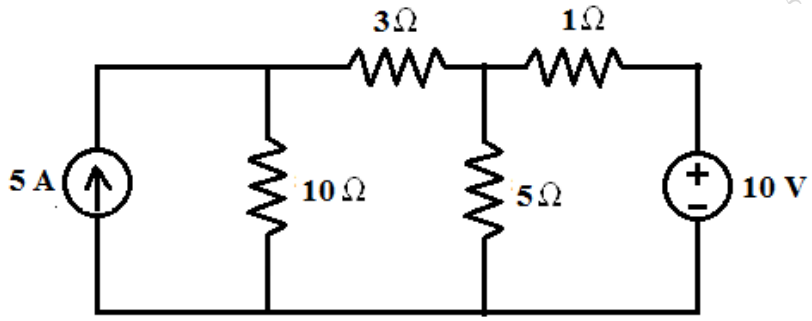


c) Give the definitions for following, (4)
1)Force 2) Work 3) Power 4) Energy

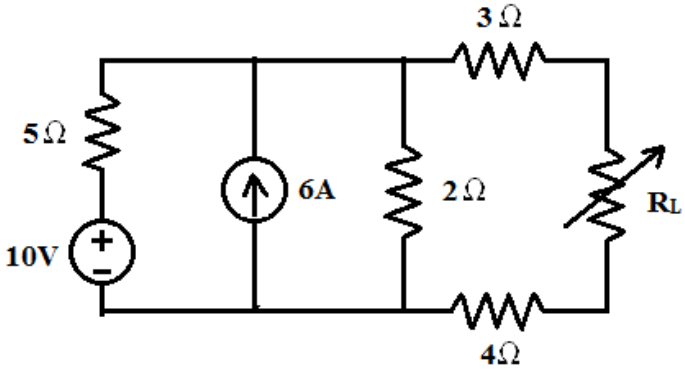
Q 2. a) Find current delivered by battery using star-delta transformation. (4)



b) For the network given below, find current through 3Ω resistor using nodal analysis. (4)



c) Find the value of R_L for which maximum power is transferred through it. Also calculate the power transferred to R_L (4)



Q 3. a) Find the following parameters of a voltage v = 200sin 314t , (4)
1)Frequency 2) Form Factor 3) Crest Factor

b) Find the resultant of following. (4)
i) $e_1 = 25\sin \omega t$ ii) $e_2 = 10 \sin (\omega t + \frac{\pi}{6})$ iii) $e_3 = 30 \cos \omega t$
iv) $e_4 = 20\sin (\omega t - \frac{\pi}{4})$

c) Find the average power in pure capacitive circuit. (4)

Q 4. a) An AC circuit consist of pure resistance and an inductive coil connected in series. The power dissipated in the resistance and the coil are 1000watts and 200 watts respectively. The voltage drop across the resistance and coil are 200V and 300V respectively. (6)
Calculate: i) Value of the resistance ii) Current through circuit iv)Resistance of coil iv)Impedance of coil v) Total impedance of circuit vi) Supply Voltage.

b) Explain with neat circuit resonance in RLC circuit. (6)

Q 5. a) Explain in brief Self induced emf and Mutually induced emf. (6)

b) Define the following terms, (3)
i)Magnetic field ii)Magnetic lines of force iii)Magnetic field strength.

c) An iron ring of mean circumference 80cm is uniformly wound with 1000 turns of wire. Calculate the value of flux density that a current of 1A would produce in ring. Assume relative permeability of an iron to be equal to 1400. (3)

Q 6. a) Derive the EMF equation of transformer. (6)

b) Derive the equation for Energy stored in Capacitor. Also determine the equivalent capacitance of circuit containing a parallel branch of 5uF and 2uF in series with two capacitors of 3uF and 4uF. (6)

------END OF PAPER-----

Dr. Babasaheb Ambedkar Technological University, Lonere-402103

Supplementary Examination December 2018

Course: First year (All branches) **Sem: I/II**

Subject: Basic Electrical Engineering (EE104/EE204) **Max. Marks – 60**

Date – 06/12/2018 **Duration: 03 Hrs.**

Instructions:

- *All Question carry 12 marks.*
- *Attempt any five questions of the following.*
- *Illustrate your answer with neat diagram wherever necessary.*
- *If some part or parameter is noticed to be missing, you may appropriately assume it and mention it clearly.*

Q 1. a) A copper conductor has its specific resistance of 1.6 x 10^{-6} Ω-cm ºC and a resistance temperature coefficient of 1/254.5 per º C at 20ºC. Find (i) the specific resistance and (ii) the resistance temperature coefficient at 60ºC. (4)

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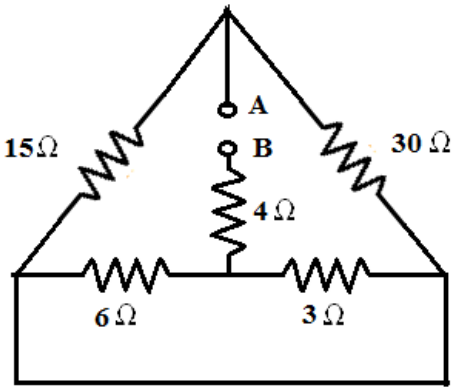

c) Give the definitions for following, (4)
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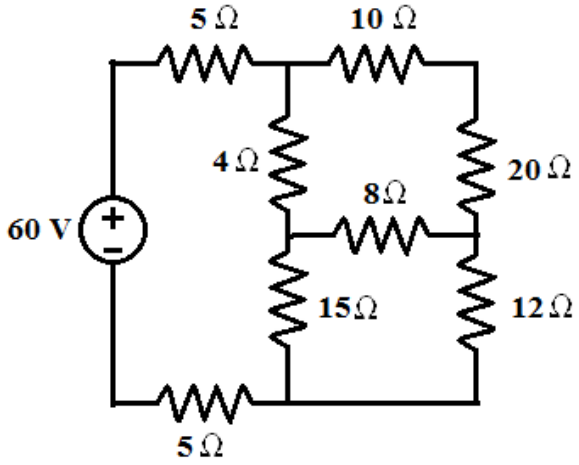
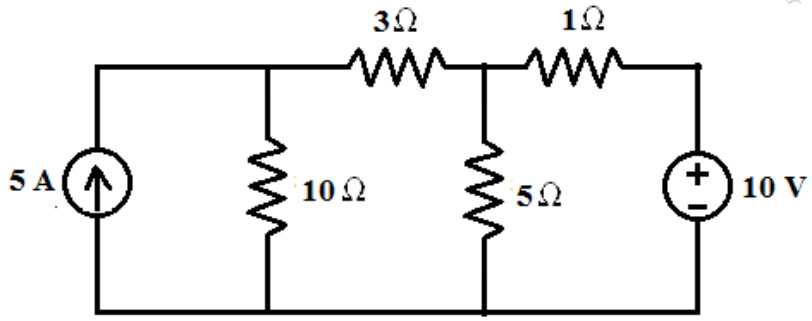
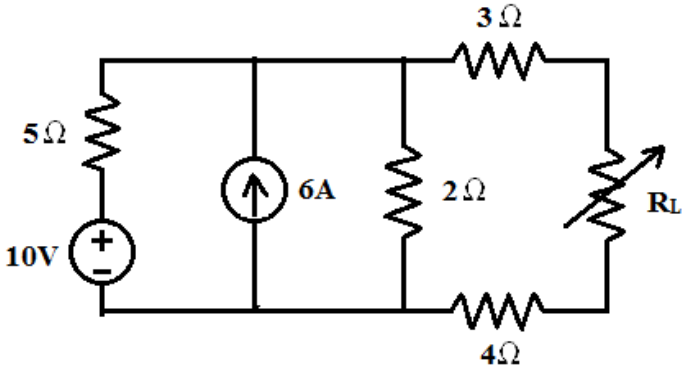


b) For the network given below, find current through 3Ω resistor using nodal analysis. (4)



c) Find the value of R_L for which maximum power is transferred through it. Also calculate the power transferred to R_L (4)



Q 3. a) Find the following parameters of a voltage v = 200sin 314t , (4)
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b) Find the resultant of following. (4)
i) $e_1 = 25\sin \omega t$ ii) $e_2 = 10 \sin (\omega t + \frac{\pi}{6})$ iii) $e_3 = 30 \cos \omega t$
iv) $e_4 = 20\sin (\omega t - \frac{\pi}{4})$

c) Find the average power in pure capacitive circuit. (4)

Q 4. a) An AC circuit consist of pure resistance and an inductive coil connected in series. The power dissipated in the resistance and the coil are 1000watts and 200 watts respectively. The voltage drop across the resistance and coil are 200V and 300V respectively. (6)
Calculate: i) Value of the resistance ii) Current through circuit iv)Resistance of coil iv)Impedance of coil v) Total impedance of circuit vi) Supply Voltage.

b) Explain with neat circuit resonance in RLC circuit. (6)

Q 5. a) Explain in brief Self induced emf and Mutually induced emf. (6)

b) Define the following terms, (3)
i)Magnetic field ii)Magnetic lines of force iii)Magnetic field strength.

c) An iron ring of mean circumference 80cm is uniformly wound with 1000 turns of wire. Calculate the value of flux density that a current of 1A would produce in ring. Assume relative permeability of an iron to be equal to 1400. (3)

Q 6. a) Derive the EMF equation of transformer. (6)

b) Derive the equation for Energy stored in Capacitor. Also determine the equivalent capacitance of circuit containing a parallel branch of 5uF and 2uF in series with two capacitors of 3uF and 4uF. (6)

------END OF PAPER-----

Dr. Babasaheb Ambedkar Technological University, Lonere
Summer Examination May-2019

Course: B. Tech. **Semester-I/II**

Subject and Subject Code: Basic Electrical Engineering (EE104/EE204)

Time- 3 Hrs **Date- 06/06/2019** **Max. Marks-60**

Instruction to Students:-

1. **Attempt any FIVE questions from** Question 1 to Question 6.
2. Illustrate your answers with neat sketches, diagrams etc wherever necessary.
3. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly.

Q.1)a) Explain circuit for three resistances connected in parallel with necessary voltage and current relations. **6M**

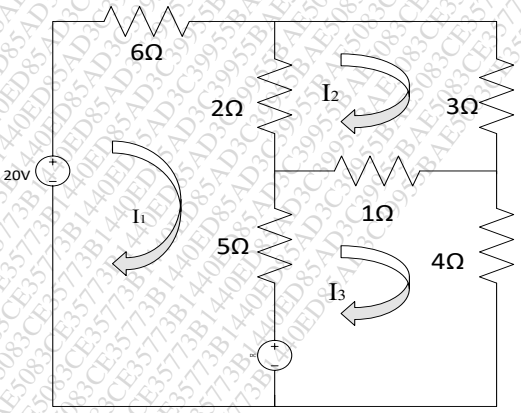
OR

b) Write note on
i) Work ii) Power iii) Energy and give relation between them.

c) A conductor has a cross-section of $10cm^2$ and specific Resistance of 7.5 μΩcm at 0^0c. What will be its Resistance in Ω/km when the temperature is 40^0c ? Take the temperature coefficient of the material = 0.005 per ^{o}c. **6M**

Q.2)a) State and prove Maximum power transfer theorem. **6M**

b) Determine the voltage V which causes the current I_1 to be zero for the circuit shown in the fig. using Mesh analysis.



6M

Q.3)a) Explain AC circuit with pure Capacitance. Derive equations for average and instantaneous power. Also draw Voltage Triangle , Impedance triangle and power triangle for the same circuit. **6M**

b) Find the resultant of the following :

$e_1 = 25 \sin\omega t$, $e_2 = 10 \sin(\omega t + \prod/6)$,

$e_3 = 30 \sin\omega t$, $e_4 = 10 \sin(\omega t - \prod/4)$.

Draw all phasors. **6M**

OR

c) An alternating current of frequency 60 Hz has amax. Value of 12 A.
i) Write down the equation of the instantaneous value.
ii) Find the value of current after 1/360 sec. & iii) Find the time taken to reach 9.6 A for the first time.

Q.4)a) Explain AC circuit with series R-L-C. Draw Voltage Triangle , Impedance triangle and power triangle for the same circuit. **6M**

OR

b) Derive the relation between 3-phase star and delta connected loads.

c) What do you mean by " Resonance"? Explain Series Resonance. **6M**

Q.5)a) State and explain Faraday's law of electromagnetic induction. **6M**

OR

b) Explain the terms i) Statically induced emf ii) Dynamically induced emf.

c) A wire of 50 cm length moves at right angles to its length at 40m/s in a uniform magnetic field of density 1Wb/m^2. Calculate the induced emf in the conductor when the direction of motion is a) perpendicular to the field b) inclined at 30^0 to the direction of the field. **6M**

Q.6)a) Derive the e. m. f equation of single phase tranformer and explain voltage and current ratio of an ideal transformer. **6M**

OR

b) Explain the following types of transformer in detail:-
i) Core type transformer ii) Shell type transformer.

c) A 10 KVA transformer having 50 number of turns on primary and 10 number of turns of secondary is connected to 440 V, 50 Hz, AC supply. Calculate:- **6M**
a) Secondary voltage on No load.
b) Full load primary and secondary current.
c) Maximum value of the flux in core.

END

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE – RAIGAD -402 103

Winter Semester Examination – December - 2019

Branch: B. Tech **Sem.:- I/II**
Subject:-Basic Electrical Engineering [EE 104/EE204] **Marks: 60**
Date:-04/12/2019 **Time:- 3 Hr.**

Instructions to the Students

1. Each question carries 12 marks.
2. Attempt **any five** questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly

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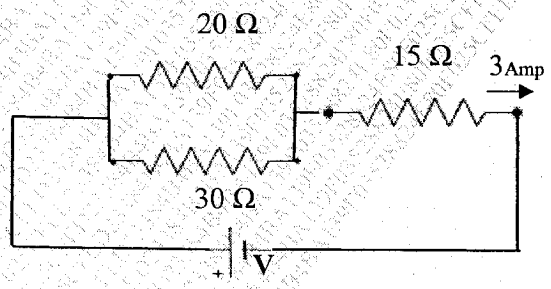
Q1.) **a)** Define the term resistance with its unit. Explain in detail factors on which resistance of metal conductor depends. **6M**

b) The resistance of a wire increases from 18 Ω at 20°C to 20 Ω at 50°C. Find i) The temperature coefficient of resistance at 0°C.ii) The resistance at 65°C. **6M**

Q2.) **a)** State and Explain Kirchhoff's laws. **6M**

b) In the given circuit current flowing through 15 ohm is 3 Amp. **6M**
i) Find the current flowing through 20 ohm and 30 ohm resistor.
ii) Find voltage V.



Q3.) **a)** Explain the R-L series circuit with phasor diagram, when connected to single phase ac supply. **6M**

b) Define the following terms.
1) RMS Value
2) Average Value
3) Form Factor
4) Peak Factor

OR

	b)	A pure inductor of 0.2 H connected across 230 Volt,50 Hz. .i) Find inductive reactance X_L ii) Maximum value of current iii) Find the Expression for current which will flow through inductor.	6M
Q4.)	a)	Explain the following terms for AC circuit with power triangle. i)Apparent power ii)Active power iii)Reactive power	6M
	b)	What is mean by resonance? Explain the RLC series resonance phenomenon in detail.	6M
		OR	
	b)	In a 3 phase Delta connection find the relation between line and phase value of current & voltage. Hence derive equation for power.	6M
Q5.)	a)	Write Comparison Between Magnetic and Electric Circuits.	6M
	b)	A rectangular iron core has a mean length of magnetic path of 100 cm, area of cross-section of 4 cm^2, relative permeability of 1400 and an air-gap of 5 mm cut in the core. The coil has number of turns, N= 600 and carries the current of 4 A. Find the flux in the air-gap.	6M
		OR	
	b)	Define the terms Dynamically, Statically, Self and Mutual induced emf.	6M
Q6.)	a)	State the working principle of a single-phase transformer and derive the EMF equation.	6M
	b)	A single-phase transformer of 800 primary turns and 1300 secondary turns. The primary is connected across 400 volt, 50 Hz. AC supply. Find i) The voltage induced in secondary winding. ii) The maximum value of flux density if the area of cross section is 50 cm^2.	6M
		OR	
	b)	Draw the circuit diagram and derive the equation for charging voltage of a capacitor.	6M

Paper End

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE – RAIGAD -402 103

End Semester Examination Dec-2018

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Branch: B. Tech. (Group A/Group B) **Sem.:- I**

Subject with Subject Code:-Basic Electronics Engineering (EXE105/EXE205)

Date: 11/12/2018 **Marks: 60** **Time:- 3 Hr.**

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Instructions:-

1. **Attempt any *Five* questions.**
2. **All questions carry equal marks.**
3. **Illustrate your answer with neat sketches, diagrams etc. wherever necessary.**
4. **Necessary data is given in the respective questions. If such data is not given, it means that the knowledge of that component is a part of examination.**
5. **If some part or parameter is noticed to be missing, you may appropriately assume and state it clearly in the answer-book.**

Q.1. A] Classify the engineering materials from materials science point of view. 06

B] Compare insulator, semiconductor and conductors. 06

Q.2. Attempt any ***two*** of the followings:

A] Describe the direct and indirect band gap semiconductors. 06

B] The resistivity of Cu is 1.72×10^{-8} ohm- m. Calculate the mobility of electrons in Cu. Given that the number of electrons per unit volume is $10.41 \times 10^{28}/\ m^3$. 06

C] Determine the concentration of conduction electrons in a sample of silicon, if one in every million silicon atom is replaced by a phosphorus atom. Assume every phosphorus atom to be singly ionized. Silicon has a molar mass of 0.028 kg/mole and density of 2300 kg/m^3. 06

Q.3 A] Find the built-in voltage for a Si p-n junction with $N_A = 10^{15} cm^{-3}$ and $N_D = 10^{17} cm^{-3}$ 06

B] Write a note on depletion layer capacitance and diffusion capacitance. 06

Q.4 Define transistor biasing. List and explain different transistor biasing techniques with suitable diagram and expressions. 12

Q.5. Attempt any ***two*** of the followings:

A] Describe the working of bridge rectifier with neat diagram and waveforms. Explain: Peak inverse voltage, ripple factor and efficiency with respect to a center tap full wave rectifier. 06

B] Explain different types of inductors in detail. 06

C] Describe construction and working of a LVDT. State any two advantages and disadvantages of LVDT. 06

Q.6 A] Do as directed: 06

a) Obtain 2's complement of 00111001

b) Add $(AFF.B3)_H$ +$(FFF.E)_H$

c) Determine the floating point representation of $(-142)_{10}$ using IEEE single precision format.

B] What are the Universal Gates? Realize a NAND gate using universal gates. 06

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DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE – RAIGAD -402 103

End Semester Examination Dec-2018

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Branch: B. Tech. (Group A/Group B) **Sem.:- I**

Subject with Subject Code:-Basic Electronics Engineering (EXE105/EXE205)

Date: 11/12/2018 **Marks: 60** **Time:- 3 Hr.**

==========

Instructions:-

1. **Attempt any *Five* questions.**
2. **All questions carry equal marks.**
3. **Illustrate your answer with neat sketches, diagrams etc. wherever necessary.**
4. **Necessary data is given in the respective questions. If such data is not given, it means that the knowledge of that component is a part of examination.**
5. **If some part or parameter is noticed to be missing, you may appropriately assume and state it clearly in the answer-book.**

Q.1. A] Classify the engineering materials from materials science point of view. 06

B] Compare insulator, semiconductor and conductors. 06

Q.2. Attempt any ***two*** of the followings:

A] Describe the direct and indirect band gap semiconductors. 06

B] The resistivity of Cu is 1.72×10^{-8} ohm- m. Calculate the mobility of electrons in Cu. Given that the number of electrons per unit volume is $10.41 \times 10^{28}/\ m^3$. 06

C] Determine the concentration of conduction electrons in a sample of silicon, if one in every million silicon atom is replaced by a phosphorus atom. Assume every phosphorus atom to be singly ionized. Silicon has a molar mass of 0.028 kg/mole and density of 2300 kg/m^3. 06

Q.3 A] Find the built-in voltage for a Si p-n junction with $N_A = 10^{15} cm^{-3}$ and $N_D = 10^{17} cm^{-3}$ 06

B] Write a note on depletion layer capacitance and diffusion capacitance. 06

Q.4 Define transistor biasing. List and explain different transistor biasing techniques with suitable diagram and expressions. 12

Q.5. Attempt any ***two*** of the followings:

A] Describe the working of bridge rectifier with neat diagram and waveforms. Explain: Peak inverse voltage, ripple factor and efficiency with respect to a center tap full wave rectifier. 06

B] Explain different types of inductors in detail. 06

C] Describe construction and working of a LVDT. State any two advantages and disadvantages of LVDT. 06

Q.6 A] Do as directed: 06

a) Obtain 2's complement of 00111001

b) Add $(AFF.B3)_H$ +$(FFF.E)_H$

c) Determine the floating point representation of $(-142)_{10}$ using IEEE single precision format.

B] What are the Universal Gates? Realize a NAND gate using universal gates. 06

****

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE – RAIGAD

Semester Examination – June - 2019

Branch: Electronics & Telecommunication Engg. Sem.:- I & II

Subject with Subject Code: Basic Electronics engineering (EXE105/EX205)

Marks: 60 Date: 08-06-2019 Time: 3 Hrs.

Instructions to the Students

1. Each question carries 12 marks.
2. Attempt **any five** questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly

Q.1 A Explain classification of materials from electrical engineering point of view with example. (6)

B What are different types of bonding? Explain with an example. (6)

Q.2 A What is doping? What is N-type material and P-type material? (6)

B Explain Hall effect with suitable diagram. Derive equation for hall coefficient? (6)

Q.3 A What is clipper? Explain operation of positive clipper with the help of suitable diagram. (6)

B For a full wave rectifier derive the expression for (6)

a. I_{dc} b.P_{dc}

Q.4 A What are different types of resistor? What is color code for 1K resistor? (6)

B What is capacitor? Explain different types of capacitor. (6)

Q.5 A What is ohmmeter? Explain working of ohmmeter with suitable example. (6)

B How temperature is measured using thermistor? Explain Advantages and Disadvantages of thermistor. (6)

Q6 A Convert the following numbers to decimal (6)

a. $(555)_8$ b.$(1FFF)_{16}$

B What are universal gates? Implement basic gates using universal gates. (6)

********************All the Best*********************

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY
LONERE – RAIGAD -402 103
Winter End Semester Examination: Dec. 2019

Branch: B. Tech. **Sem.:- I/II**

Subject:- Basic Electronics Engineering (EXE105/EXE205) **Marks: 60**

Date:- 06/12/2019 **Time:- 3 Hr.**

Instructions:-

1. **Attempt any *Five* questions.**
2. **All questions carry equal marks.**
3. **Illustrate your answer with neat sketches, diagrams etc. wherever necessary.**
4. **Necessary data is given in the respective questions. If such data is not given, it means that the knowledge of that component is a part of examination.**
5. **If some part or parameter is noticed to be missing, you may appropriately assume and state it clearly in the answer-book.**

Q.1. A] Describe essential features of the following bonds: 06
(a) Ionic bond
(b) Covalent bond
(c) Metallic bond

B] Explain the classification of materials with electrical engineering point of view. 06

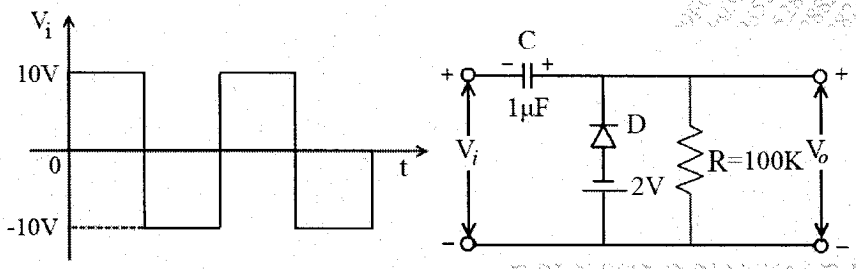
Q.2. Attempt any ***two*** of the followings:

A] How does the Fermi level changes with increasing temperature in the extrinsic semiconductors (***n***- type and ***p*** -type)? Sketch the energy level diagram. 06

B] What is Hall effect? Calculate Hall voltage, Hall coefficient and Hall angle. 06

C] Find the built-in voltage for a ***Si*** P-N junction with $N_A = 10^{15} cm^{-3}$ and $N_D = 10^{17} cm^{-3}$ at room temperature with $n_i = 10^{10} cm^{-3}$. 06

Q.3 A] Sketch V_o for the circuit and the input shown. ***D*** is a silicone diode with cut in voltage $V_v = 0.6V$. 06



B] Write a note on depletion layer capacitance and diffusion capacitance. 06

Q.4 Define transistor biasing. List and explain different transistor biasing techniques with suitable diagram and expressions. 12

Q.5. Attempt any ***two*** of the followings:

A] Describe the working of center tap full wave rectifier with neat diagram and waveforms. Explain: Peak inverse voltage, ripple factor and efficiency with respect to a center tap full wave rectifier. 06

B] Explain different types of resistors in detail. What is the color code for 1KΩ resistor? 06

C] Describe construction and working of a LVDT. State any two advantages and disadvantages of LVDT. 06

Q.6 A] Do as directed: 06

a) Obtain 2's complement of 10111011

b) Add $(AF1.B3)_H + (FFF.E)_H$

c) Determine the floating point representation of $(-142)_{10}$ using IEEE single precision format.

B] Explain AND, OR, NAND, NOR, Ex-OR, Ex-NOR logic gates with their logic diagram and truth table. 06

********PAPER END*******

SLR-TX – 15

Seat No.	

Set **P**

F.E. (Part – II) (New CBCS) Examination, 2018
BASIC ELECTRONICS

Day and Date : Thursday, 22-11-2018 Total Marks : 35
Time : 10.00 a.m. to 12.00 noon

Instructions *:* *1)* ***All*** *questions are* ***compulsory****.*
2) Assume suitable data ***if*** *required.*
3) Figures to the ***right*** *indicate maximum marks.*
4) Q. No. ***1*** *is* ***compulsory****. It should be solved in* ***first 15 minutes*** *in Answer Book Page No.* ***3****.* ***Each*** *question carries* ***one*** *mark.*
5) ***Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.***

MCQ/Objective Type Questions

Duration : 15 Minutes Marks : 7

1. Choose the correct answer :

1) A pentavalent impurity has _____ valence electrons.
   a) 3
   b) 5
   c) 4
   d) 6

2) A Zener diode is used as
   a) An amplifier
   b) A transducer
   c) A voltage regulator
   d) A multivibrator

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

P.T.O.

4) A transistor has
   a) One PN junction
   b) Two PN junction
   c) Three PN junction
   d) Four PN junction

5) In a transistor
   a) $I_C = I_E + I_B$
   b) $I_E = I_C - I_B$
   c) $I_B = I_C + I_E$
   d) $I_E = I_C + I_B$

6) Thermocouple is a _____ transducer and used for measurement of
   a) Passive, Temperature
   b) Active, Light sensitivity
   c) Active, Displacement
   d) Active, Temperature

7) The binary number 10101 is equivalent to decimal number
   a) 19
   b) 12
   c) 27
   d) 21

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SLR-TX – 15

Seat No.	

F.E. (Part – II) (New CBCS) Examination, 2018
BASIC ELECTRONICS

Day and Date : Thursday, 22-11-2018 Marks : 28
Time : 10.00 a.m. to 12.00 noon

***Instructions** : 1) **All** questions are **compulsory**.*
*2) Figures to the **right** indicate **full** marks.*
*3) Assume suitable data **if** required.*

SECTION – I

2. Attempt **any two** : **(2×3=6)**

1) Explain capacitor filter for bridge rectifier with suitable circuit diagram and waveforms.

2) Explain application of transistor as a switch.

3) Explain difference between half wave and full wave rectifier with circuit diagram and waveforms.

3. Attempt **any two** : **(2×4=8)**

1) Explain zener as a voltage regulator with neat diagram.

2) Explain input and output characteristics of common base configuration of transistor.

3) Draw and explain common anode LED display along with truth table.

SECTION – II

4. Attempt **any two** : **(2×3=6)**

1) State and prove De-Morgan's theorem.

2) Briefly explain the principle of operation of LVDT with suitable diagram.

3) Simplify the following Boolean expression
$A\overline{B} + AB\overline{C} + ABCD + ABC\overline{D}$

Set P

5. Attempt **any two** : **(2×4=8)**

   1) Realize basic gates using universal gates.

   2) Perform following subtraction using 2's complement method and represent the result in octal number system.
      i) $(756)_8 - (637)_8$
      ii) $(10011)_2 - (10001)_2$

   3) Write a short note on the following :
      a) Thermistor
      b) LDR.

_____

Set P

SLR-TX – 15

Seat No.	

Set Q

F.E. (Part – II) (New CBCS) Examination, 2018
BASIC ELECTRONICS

Day and Date : Thursday, 22-11-2018 Total Marks : 35
Time : 10.00 a.m. to 12.00 noon

Instructions *:* 1) ***All*** *questions are* ***compulsory****.*
2) *Assume suitable data* ***if*** *required.*
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5) ***Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.***

MCQ/Objective Type Questions

Duration : 15 Minutes Marks : 7

1. Choose the correct answer :

1) A transistor has
   a) One PN junction
   b) Two PN junction
   c) Three PN junction
   d) Four PN junction

2) In a transistor
   a) $I_C = I_E + I_B$
   b) $I_E = I_C - I_B$
   c) $I_B = I_C + I_E$
   d) $I_E = I_C + I_B$

3) Thermocouple is a _____ transducer and used for measurement of
   a) Passive, Temperature
   b) Active, Light sensitivity
   c) Active, Displacement
   d) Active, Temperature

P.T.O.

4) The binary number 10101 is equivalent to decimal number
   a) 19
   b) 12
   c) 27
   d) 21

5) A pentavalent impurity has _____ valence electrons.
   a) 3
   b) 5
   c) 4
   d) 6

6) A Zener diode is used as
   a) An amplifier
   b) A transducer
   c) A voltage regulator
   d) A multivibrator

7) The maximum efficiency of half wave rectifier is
   a) 40.6%
   b) 81.2%
   c) 50%
   d) 25%

_____

SLR-TX – 15

Seat No.	

F.E. (Part – II) (New CBCS) Examination, 2018
BASIC ELECTRONICS

Day and Date : Thursday, 22-11-2018 Marks : 28
Time : 10.00 a.m. to 12.00 noon

***Instructions** : 1) **All** questions are **compulsory**.*
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SECTION – I

2. Attempt **any two** : **(2×3=6)**
   1) Explain capacitor filter for bridge rectifier with suitable circuit diagram and waveforms.
   2) Explain application of transistor as a switch.
   3) Explain difference between half wave and full wave rectifier with circuit diagram and waveforms.

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   1) Explain zener as a voltage regulator with neat diagram.
   2) Explain input and output characteristics of common base configuration of transistor.
   3) Draw and explain common anode LED display along with truth table.

SECTION – II

4. Attempt **any two** : **(2×3=6)**
   1) State and prove De-Morgan's theorem.
   2) Briefly explain the principle of operation of LVDT with suitable diagram.
   3) Simplify the following Boolean expression
   $A\overline{B} + AB\overline{C} + ABCD + ABC\overline{D}$

Set Q

5. Attempt **any two** : **(2×4=8)**

   1) Realize basic gates using universal gates.

   2) Perform following subtraction using 2's complement method and represent the result in octal number system.
      i) $(756)_8 - (637)_8$
      ii) $(10011)_2 - (10001)_2$

   3) Write a short note on the following :
      a) Thermistor
      b) LDR.

_____

Set Q

SLR-TX – 15

Seat No.	

Set **R**

F.E. (Part – II) (New CBCS) Examination, 2018
BASIC ELECTRONICS

Day and Date : Thursday, 22-11-2018 Total Marks : 35
Time : 10.00 a.m. to 12.00 noon

Instructions *:* *1)* ***All*** *questions are* ***compulsory****.*
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MCQ/Objective Type Questions

Duration : 15 Minutes Marks : 7

1. Choose the correct answer :

1) Thermocouple is a _____ transducer and used for measurement of
   a) Passive, Temperature
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   c) Active, Displacement
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3) A pentavalent impurity has _____ valence electrons.
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P.T.O.

4) A Zener diode is used as
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SLR-TX – 15

Seat No.	

F.E. (Part – II) (New CBCS) Examination, 2018
BASIC ELECTRONICS

Day and Date : Thursday, 22-11-2018 Marks : 28
Time : 10.00 a.m. to 12.00 noon

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SECTION – I

2. Attempt **any two** : **(2×3=6)**
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3. Attempt **any two** : **(2×4=8)**
   1) Explain zener as a voltage regulator with neat diagram.
   2) Explain input and output characteristics of common base configuration of transistor.
   3) Draw and explain common anode LED display along with truth table.

SECTION – II

4. Attempt **any two** : **(2×3=6)**
   1) State and prove De-Morgan's theorem.
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   3) Simplify the following Boolean expression
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Set R

5. Attempt **any two** : **(2×4=8)**

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      ii) $(10011)_2 - (10001)_2$

   3) Write a short note on the following :
      a) Thermistor
      b) LDR.

_____

Set R

SLR-TX – 15

Seat No.	

Set S

F.E. (Part – II) (New CBCS) Examination, 2018
BASIC ELECTRONICS

Day and Date : Thursday, 22-11-2018 Total Marks : 35
Time : 10.00 a.m. to 12.00 noon

Instructions *:* 1) ***All*** *questions are* ***compulsory****.*
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MCQ/Objective Type Questions

Duration : 15 Minutes Marks : 7

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   d) 25%

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P.T.O.

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   a) Passive, Temperature
   b) Active, Light sensitivity
   c) Active, Displacement
   d) Active, Temperature

5) The binary number 10101 is equivalent to decimal number
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   b) A transducer
   c) A voltage regulator
   d) A multivibrator

_____

SLR-TX – 15

Seat No.	

F.E. (Part – II) (New CBCS) Examination, 2018
BASIC ELECTRONICS

Day and Date : Thursday, 22-11-2018 Marks : 28
Time : 10.00 a.m. to 12.00 noon

***Instructions** : 1) **All** questions are **compulsory**.*
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SECTION – I

2. Attempt **any two** : **(2×3=6)**
   1) Explain capacitor filter for bridge rectifier with suitable circuit diagram and waveforms.
   2) Explain application of transistor as a switch.
   3) Explain difference between half wave and full wave rectifier with circuit diagram and waveforms.

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   1) Explain zener as a voltage regulator with neat diagram.
   2) Explain input and output characteristics of common base configuration of transistor.
   3) Draw and explain common anode LED display along with truth table.

SECTION – II

4. Attempt **any two** : **(2×3=6)**
   1) State and prove De-Morgan's theorem.
   2) Briefly explain the principle of operation of LVDT with suitable diagram.
   3) Simplify the following Boolean expression
   $A\overline{B} + AB\overline{C} + ABCD + ABC\overline{D}$

Set S

5. Attempt **any two** : **(2×4=8)**

   1) Realize basic gates using universal gates.

   2) Perform following subtraction using 2's complement method and represent the result in octal number system.
      i) $(756)_8 - (637)_8$
      ii) $(10011)_2 - (10001)_2$

   3) Write a short note on the following :
      a) Thermistor
      b) LDR.

_____

Dr. Babasaheb Ambedkar Technological University, Lonere-402103

Supplementary Examination December 2018

Course: First year (All branches) **Sem: I/II**

Subject: Basic Electrical Engineering (EE104/EE204) **Max. Marks – 60**

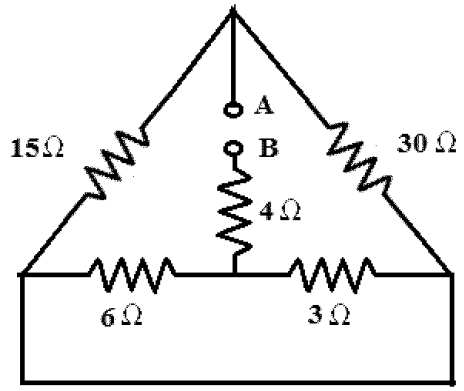
Date – 06/12/2018 **Duration: 03 Hrs.**

Instructions:

- *All Question carry 12 marks.*
- *Attempt any five questions of the following.*
- *Illustrate your answer with neat diagram wherever necessary.*
- *If some part or parameter is noticed to be missing, you may appropriately assume it and mention it clearly.*

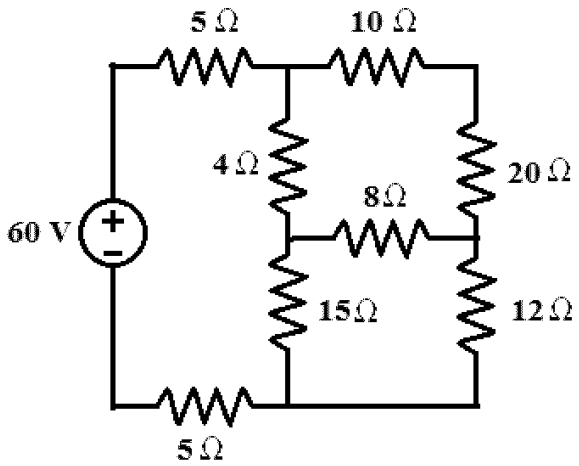
Q 1. a) A copper conductor has its specific resistance of 1.6×10^{-6} Ω-cm ºC and a resistance temperature coefficient of 1/254.5 per º C at 20ºC. Find (i) the specific resistance and (ii) the resistance temperature coefficient at 60ºC. (4)

b) Find equivalent resistance between terminal A & B. (4)

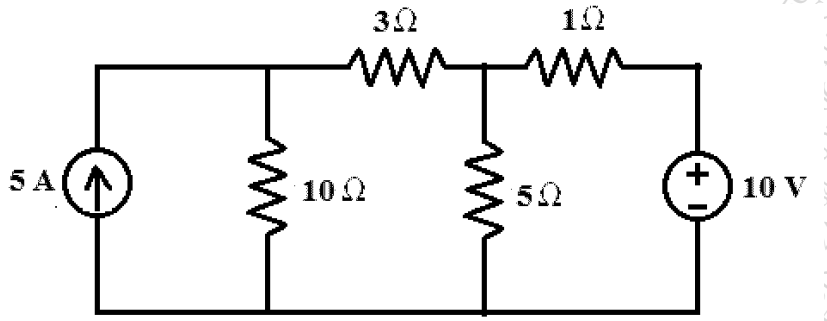


c) Give the definitions for following, (4)
1)Force 2) Work 3) Power 4) Energy

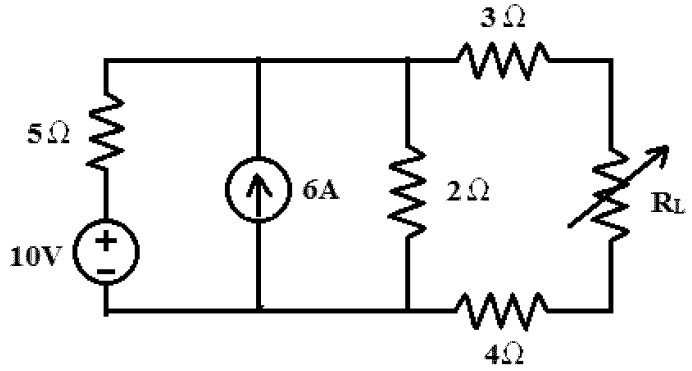
Q 2. a) Find current delivered by battery using star-delta transformation. (4)



b) For the network given below, find current through 3Ω resistor using nodal analysis. (4)



c) Find the value of R_L for which maximum power is transferred through it. Also calculate the power transferred to R_L (4)



Q 3. a) Find the following parameters of a voltage v = 200sin 314t , (4)
1)Frequency 2) Form Factor 3) Crest Factor

b) Find the resultant of following. (4)
i) $e_1 = 25\sin \omega t$ ii) $e_2 = 10 \sin (\omega t + \frac{\pi}{6})$ iii) $e_3 = 30 \cos \omega t$
iv) $e_4 = 20\sin (\omega t - \frac{\pi}{4})$

c) Find the average power in pure capacitive circuit. (4)

Q 4. a) An AC circuit consist of pure resistance and an inductive coil connected in series. The power dissipated in the resistance and the coil are 1000watts and 200 watts respectively. The voltage drop across the resistance and coil are 200V and 300V respectively. (6)
Calculate: i) Value of the resistance ii) Current through circuit iv)Resistance of coil iv)Impedance of coil v) Total impedance of circuit vi) Supply Voltage.

b) Explain with neat circuit resonance in RLC circuit. (6)

Q 5. a) Explain in brief Self induced emf and Mutually induced emf. (6)

b) Define the following terms, (3)
i)Magnetic field ii)Magnetic lines of force iii)Magnetic field strength.

c) An iron ring of mean circumference 80cm is uniformly wound with 1000 turns of wire. Calculate the value of flux density that a current of 1A would produce in ring. Assume relative permeability of an iron to be equal to 1400. (3)

Q 6. a) Derive the EMF equation of transformer. (6)

b) Derive the equation for Energy stored in Capacitor. Also determine the equivalent capacitance of circuit containing a parallel branch of 5uF and 2uF in series with two capacitors of 3uF and 4uF. (6)

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