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20AES0201T

B.Tech. DEGREE EXAMINATION, JULY 2024.

First Semester

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

(Common to I Semester CE, CSE & ME)

(RU20 Regulations)

(Supplementary)

Time : 3 Hours *Max. Marks : 70*

SECTION – A

PART — A

(Compulsory Question) **(5 × 1 = 5 Marks)**

1. Answer the following :

   (a) Define KCL.

   (b) Define reactive power.

   (c) Write the emf equation for DC generator.

   (d) What is the principal operation of single phase transformer?

   (e) What are the types of Transmission lines?

PART — B

(Answer ONE full question from each unit; All questions carry equal marks)

(3 × 10 = 30 Marks)

UNIT I

2. Explain KVL and KCL with examples.

Or

3. Derive form factor.

UNIT II

4. Draw the OCC characteristics of DC generator.

Or

5. Explain the principle operation of 3 phase AC machines.

Turn Over

UNIT III

6. Explain about the solar power generation.

Or

7. Explain about the Primary and secondary distribution systems.

SECTION – B

PART — A

(Compulsory Question) (5 × 1 = 5 Marks)

8. Answer the following :

(a) Draw the characteristics of PN junction diode.

(b) What is meant by breakdown and when it happens in PN junction diode?

(c) What is BJT?

(d) What is counter?

(e) What is micro controller?

PART — B

(Answer ONE full question from each unit; All questions carry equal marks)

(3 × 10 = 30 Marks)

UNIT I

9. Explain about BJT.

Or

10. With a neat sketch explain the working of half WAVE RECTIFIER.

UNIT II

11. Explain pin configuration of 741 op-amp.

Or

12. Write the application of 741 Op-Amp.

UNIT III

13. Briefly explain about BCD adder.

Or

14. Draw and explain the operation of a SR Flip-Flop.

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20AES0201T

B.Tech DEGREE EXAMINATION, FEBRUARY/MARCH 2023.

First Semester

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

(Common to I Semester CE, CSE and ME)

Time : 3 *Hours* *Max. Marks : 70*

PART -- A

(Compulsory question)

Answer the following. **(5 × 1 = 5 Marks)**

1. (a) What is Resonance?

   (b) State The Super Position Theorem.

   (c) What is the principal of operation of DC Generator?

   (d) What is the principal of operation of DC Motor?

   (e) List types of distribution systems.

Answer one FULL question from each unit. All questions carry EQUAL marks. **(3 × 10 = 30 Marks)**

UNIT -- I

2. State and explain Kirchhoff's voltage and current law with an example. (10)

Or

3. The Q factor of a RLC series circuit is 5 at a resonance frequency of 1 KHz. Assuming the power dissipation of 250W, when the current drawn is 1A, find the circuit parameters. (10)

UNIT - II

4. Explain how will you classify DC generators in detail and also explain the types of DC generators. (10)

Or

5. Derive the induced e.m.f equation of transformer. (10)

Turn Over

UNIT – III

6. Draw and explain the layout of hydro electric power plant. (10)

Or

7. Describe wind generating stations. (10)

PART — B

(Compulsory question)

Answer the following. (5 × 1 = 5 Marks)

1. (a) List The applications of PN Diode?

   (b) Draw The Symbolic Representation of NPN and PNP Transistors.

   (c) List The Characteristics Of OP-amp.

   (d) What is CMRR?

   (e) Draw the circuit Diagram of SR Latch.

Answer one FULL question from each unit; All questions carry EQUAL marks.
(3 × 10 = 30 Marks)

UNIT – I

2. Explain the formation of depletion region in a PN junction. (10)

Or

3. With necessary waveforms, explain the operation of bridge rectifier. (10)

UNIT – II

4. Draw the circuit Diagram of Non-inverting amplifier and Derive The Equation for Gain. (10)

Or

5. Explain About Application of OP-Amp as adder. (10)

UNIT – III

6. Briefly explain about Right Shift Register. (10)

Or

7. Write the application of Micro controller. (10)

12-10-2022 AN

19AES0201

B.Tech. DEGREE EXAMINATION, OCTOBER 2022.

End Examination

First Semester

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

(Common to I Semester CE, ME & ECE)

(Academic Year 2021 – 22)

(RU19 Regulations)

(Supplementary)

Time : 3 Hours *Max. Marks : 70*

PART — A

(Compulsory Questions)

Answer the following. **(10 × 2 = 20 Marks)**

1. (a) What is Reverse bias briefly explain with neat sketch?
   (b) Write any two applications of ohms Law?
   (c) What is meant by CRT?
   (d) Define semiconductor with examples.
   (e) Write a short note on Rectifier.
   (f) What is Transistor Biasing.
   (g) Explain about Reverse bias operation with diagram?
   (h) Write about full wave rectifiers.
   (i) What is Varactor diode?
   (j) Write is mathematical expression for Fermi Energy.

PART — B

Answer One FULL Question from each Unit; All questions carry EQUAL marks.

(5 × 10 = 50 Marks)

UNIT – I

2. (a) Explain about Nodal Analysis Method. (5)
   (b) Explain about Kirchhoff's Law. (5)

Or

3. (a) Explain about Mesh Analysis method? (5)
   (b) Explain about Series and Parallel connection. (5)

Turn Over

UNIT – II

4. (a) Explain about working of Cathode Ray Oscilloscope. (5)

   (b) Explain the working principle of Digital Multi meter (DMM)? (5)

Or

5. (a) Derive the expression for PN Diode current equation? (5)

   (b) Explain the operation of PNP and NPN Transistor operation? (5)

UNIT – III

6. (a) Describe Intrinsic semiconductor with carrier concentration. (5)

   (b) Write Characteristics of PN junction diode. (5)

Or

7. (a) Explain about Reverse bias characteristics with neat diagram? (5)

   (b) Explain about Light Emitting Diode with required diagram. (5)

UNIT – IV

8. (a) Explain about Series voltage and shunt voltage regulator. (5)

   (b) Explain about RL series circuit operation? (5)

Or

9. (a) Write any five advantages of Bridge Rectifiers. (5)

   (b) Discuss the significance of L section Filter. (5)

UNIT – V

10. (a) Explain about LC Filter operation with required equations? (5)

    (b) Explain about Series voltage regulator? (5)

Or

11. (a) Describe Zener diode and write some applications. (5)

    (b) Explain construction and operation of Bipolar junction Transistor. (5)

Time: 3 Hours Max. Marks: 70

PART-A (10 X 2 = 20 M)

(Compulsory Question)

Answer the following.

			Unit	Marks
1	a)	Define power factor, impedance, inductive and capacitive reactances.	I	(2 M)
	b)	Why Capacitor does not allow sudden changes in voltage?	I	(2 M)
	c)	What is the basic difference between Attractive and Repulsive type meters?	II	(2 M)
	d)	What is the purpose of DMMs?	II	(2 M)
	e)	What is the Fermi level?	III	(2 M)
	f)	What are the applications of LED?	III	(2 M)
	g)	What are the disadvantages of presence of harmonics?	IV	(2 M)
	h)	What is the need of filters in rectifier circuits?	IV	(2 M)
	i)	What is the importance of Schottky diode?	V	(2 M)
	j)	What is avalanche breakdown?	V	(2 M)

PART-B (5 X 10 = 50 M)

(Answer One FULL Question from each Unit; All questions carry EQUAL marks)

UNIT-I

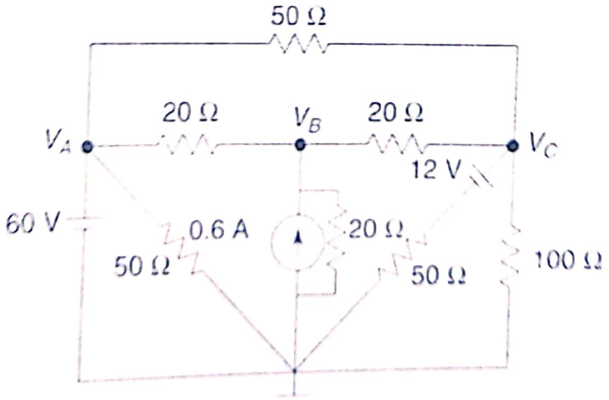
2 a) Two group of resistances, one consisting of 4 ohms, 6 ohms and 12 ohms in parallel and other consisting of 3 ohms and 6 ohms in parallel are connected in series with a source of 10 V having an internal resistance of 1 ohm. Calculate resistance of entire circuit. (5 M)

b) Explain AC circuit analysis for R-L and R-C circuits with the help of phasor diagram (5 M)

(OR)

3 a) Explain the concept of current division rule and Voltage division rule with the help of an example. (5 M)

b) Find the voltage across 100 ohms using Nodal Analysis (5 M)



UNIT-II

4 a) Explain the difference between gravity control & Spring control (5 M)

b) Explain in detail about electric and magnetic fields (5 M)

(OR)

5 a) Explain in detail the importance of CRO (5 M)

b) What is the difference between electric and magnetic fields? (5 M)

(P.T.O)

UNIT-III

6 a) What is doping? Explain the different types of extrinsic semiconductors (5 M)

b) Explain the phenomenon of diffusion charge carriers in semiconductor. (5 M)

(OR)

7 a) What is Boltzmann equation? Describe its role in establishing V-I characteristics of semiconductor diode. (5 M)

b) Explain about Light Emitting Diode with required diagram. (5 M)

UNIT-IV

8 a) Compare the various rectifiers existing and mentions respective advantages and disadvantages (5 M)

b) Explain briefly about the harmonics existing in Bridge circuit (5 M)

(OR)

9 a) Explain the differences between clippers and clampers (5 M)

b) Explain in detail the working of shunt voltage regulator with the help of diagram (5 M)

UNIT-V

10 a) Explain in detail the operation of Zener diode (5 M)

b) Explain in detail the basic logic gates along with their truth tables. (5 M)

(OR)

11 a) Justify which is the best among tunnel diode, varactor diode and photo diode. (5 M)

b) Why configuration is mostly preferred among CB, CC and CE. Justify (5 M)

01/09/2021

B.Tech I Semester End Examinations March / April – 2021

Basic Electrical and Electronics Engineering (19AES0201)

(Common to I Semester CE, ME & ECE and II Semester CSE)

Time: 3 Hours SET -I Max. Marks: 70

PART-A (10 X 2 = 20 M)

(Compulsory Question)

Answer the following.		**Unit**	**Marks**
1 a)	Write a short note on ohms Law?	I	(2 M)
b)	What is meant by Kirchoff's Law?	I	(2 M)
c)	What is Thermistor?	II	(2 M)
d)	Give the application of Regulated power supply.	II	(2 M)
e)	Draw the symbol for Varactor diode and plot V-I Characteristics of it.	III	(2 M)
f)	Draw the V-I characteristics of PN junction Diode.	III	(2 M)
g)	What is the PIV and Efficiency of Half wave rectifier?	IV	(2 M)
h)	What is the ripple factor for a half-wave and full-wave rectifier?	IV	(2 M)
i)	Write two applications of photo diode?	V	(2 M)
j)	What is a transistor? Give its circuit symbol.	V	(2 M)

PART-B (5X 10 = 50 M)

(Answer One FULL Question from each Unit; All questions carry EQUAL marks)

UNIT-I

2	a)	Explain about Basic Electrical Circuit elements?	(5 M)
	b)	Explain the Analysis of single-phase RC series circuits?	(5 M)
		(OR)	
3	a)	Explain about Mesh Analysis method?	(5 M)
	b)	Explain the Analysis of single phase RLC series circuits?	(5 M)

UNIT-II

4	a)	Explain about moving iron instruments?	(5 M)
	b)	Explain the working principle of Digital Multimeter (DMM)?	(5 M)
		(OR)	
5	a)	Explain about working of Cathode Ray Oscilloscope?	(5 M)
	b)	Explicate in detail Megger instrument?	(5 M)

UNIT-III

6	a)	Explicate the operation of forward biased and reverse biased PN junction Diode?	(5 M)
	b)	Derive the diode current equation.	(5 M)
		(OR)	
7	a)	Distinguish between drift and diffusion current in a semiconductor.	(5 M)
	b)	Write in detail Light Emitting Diode (LED).	(5 M)

UNIT-IV

8	a)	Draw the circuit diagram of a Full wave rectifier. Explicate the operation of the circuit with relevant waveforms.	(5 M)
	b)	Find out the ripple factor of a FWR with a shunt capacitor filter.	(5 M)
		(OR)	
9	a)	Derive all the necessary parameters of HWR.	(5 M)

b) Explicate about Zener diode as a Regulator.

UNIT-V

10 a) Distinguish between Zener breakdown and Avalanche breakdown.

b) Write in detail: i) Varactor diode ii) Schottky Barrier diode.

(OR)

11 a) Explicate the basic difference between NPN and PNP transistor. (5 M)

b) Explicate Basic Logic Gates. (5 M)

B.Tech. DEGREE EXAMINATION, FEBRUARY 2021

End Semester Examination

First Semester

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

Time : 3 Hours *Max. Marks : 70*

PART — A

(Compulsory Question) (10 × 2 = 20)

Answer the following :

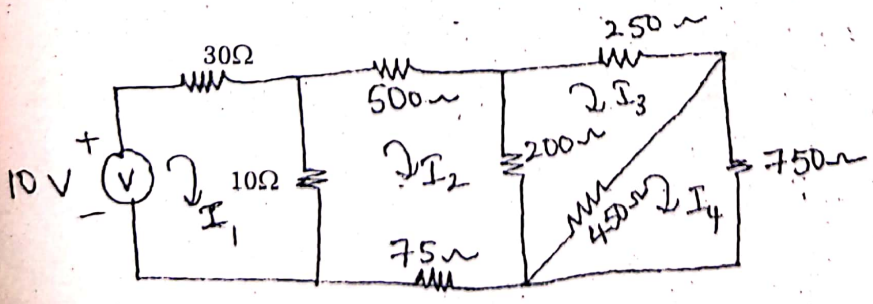
1. (a) State and explain Ohm's law.
   (b) How does the voltage gets distributed in a series connection of resistors?
   (c) Define static electric field and static magnetic field.
   (d) Draw the block diagram of a regulated power supply.
   (e) Plot the V-I characteristics of a PN diode in forward and reverse bias.
   (f) What is the need of a rectifier?
   (g) State the advantages of bridge rectifier.
   (h) Explain zener breakdown.
   (i) List the applications of Tunnel diode.
   (j) Write down the truth tables of
      (i) EX-OR gate
      (ii) AND gate.

PART — B

Answer ALL questions. (5 × 10 = 50)

UNIT I

2. (a) Explain the Kirchoff's voltage law with an example of 3 loops.
   (b) Solve the following

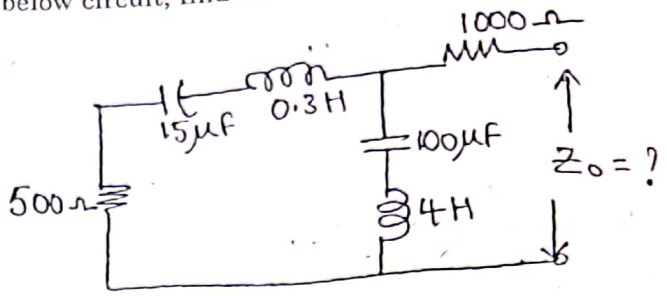


Find I_1, I_2, I_3 and I_4.

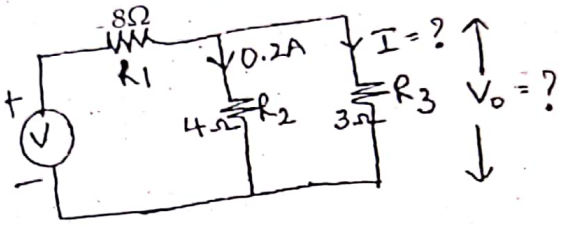
Or

Turn Over

3. (a) For the below circuit, find the circuit impedance.



(b) Solve the following problem.



UNIT II

4. (a) Describe the working of moving coil ammeter.

(b) Explain the working of CRO.

Or

5. (a) Explain the working of thermistor.

(b) How does a digital multi meter (DMM) works?

UNIT III

6. (a) Explain the working of LED.

(b) Explain about entrinsic and intrinsic semiconductors with the help of band diagrams.

Or

7. (a) Describe the qualitative theory of a P-N Junction.

(b) Distinguish between P type and N type semiconductors.

UNIT IV

8. (a) Explain the working of a Half wave rectifier.

(b) Describe the working a capacitor filter in a full wave rectifier.

Or

9. (a) How does a shunt voltage regulator gives a constant output voltage?

(b) Explain the working of a bridge rectifier.

UNIT V

10. (a) Explain the working of Schottky diode.

(b) Draw and explain the input/output characteristics of CB configuration.

Or

11. (a) Derive the expression for relation between current gains of CE, CB and CC.

(b) How does a varactor diode useful as a varicap? Explain with the help of characteristics curve?

23/02/2021

19-AES-0201

I/IV B.Tech. DEGREE EXAMINATION, FEBRUARY 2021.

End Semester Examination

Second Semester

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

(RU 19 Regulations)

Time : 3 Hours *Max. Marks : 70*

PART — A

Answer the following. **(10 × 2 = 20 Marks)**

(Compulsory Questions)

1. (a) What is AC circuit? Explain briefly.
   (b) Discuss Mesh analysis briefly.
   (c) Discuss briefly about the linear model power supply.
   (d) What is cathode ray tube? Explain briefly.
   (e) What is intrinsic semiconductors? Explain briefly.
   (f) Define semiconductor. What is PN junction diode?
   (g) What is LED? Explain briefly.
   (h) Draw the circuit of a series voltage regulator.
   (i) Discuss about the Zener diode as regulator.
   (j) What is tunnel diode? Explain briefly.

PART — B

Answer ONE full question from each unit. **(5 × 10 = 50 Marks)**

All questions carry equal marks.

UNIT–I

(a) Explain about Nodel Analysis method.

(b) Explain AC circuit and DC circuits.

Or

3. (a) Explain Ohms and Kirchoffs laws.

(b) Explain R - L - C Circuit and obtaining its equation.

UNIT–II

4. (a) Derive the expression for the electrostatic deflection sensitivity of a cathode ray.

(b) Explain the working principle of Digital Multimeter.

Or

5. (a) Explain about the Electric fields and Magnetic fields.

(b) Discuss about the linear mode power supply.

UNIT–III

6. (a) Derive the expression for the diffusion Capacitance of a PN Junction diode.

(b) Discuss about the P-Type semiconductor and N -type semiconductor.

Or

7. (a) Explain about the Qualitative theory of P - N junction.

(b) Discuss about the Intrinsic and extrinsic semiconductor.

UNIT–IV

8. (a) Discuss about the Half wave rectifiers and Full wave rectifiers.

(b) Explain about Bridge rectifier and its advantages.

Or

9. (a) Explain the Harmonic components in a Rectifier circuit.

(b) What is filters? Explain different types of filters.

UNIT–V

10. (a) Explain the different break - down mechanism in the Zener diode.

(b) Explain the input and output characteristics of BJT in CB configuration.

Or

11. (a) Explain Avalanche break down and Zener break down.

(b) Discuss the principle of operation of BJT.

01-02-2020

19–AES–0201

B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2019.

First Semester

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

Time : 3 Hours *Max. Marks : 70*

PART — A

Answer the following. **(10 × 2 = 20 Marks)**

1. (a) Explain Kirchoffs current law.

(b) How to find the effective resistance in a parallel connected resistor network?

(c) Explain about static magnetic fields?

(d) Distinguish between principle of working between moving coil and moving iron instruments.

(e) State the applications of a PN diode.

(f) List out any four semiconductors with their atomic number and electron distribution

(g) Draw the output waveforms of a full wave rectifier.

(h) Draw the circuit of a series voltage regulator

(i) Draw the characteristic graph of a tunnel diode.

(j) Draw the input and output characteristics of CC configuration.

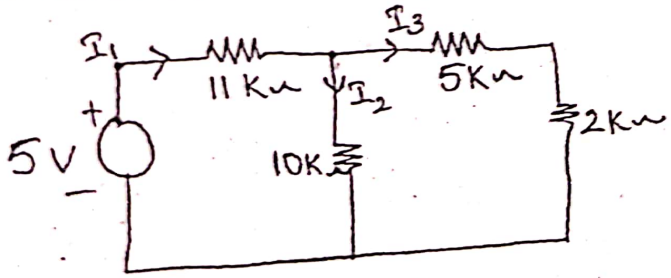
PART — B

Answer ONE full question from each Unit. **(5 × 10 = 50 Marks)**

All questions carry equal marks.

UNIT I

2. (a) What is the voltage drop across each resistor in below circuit?

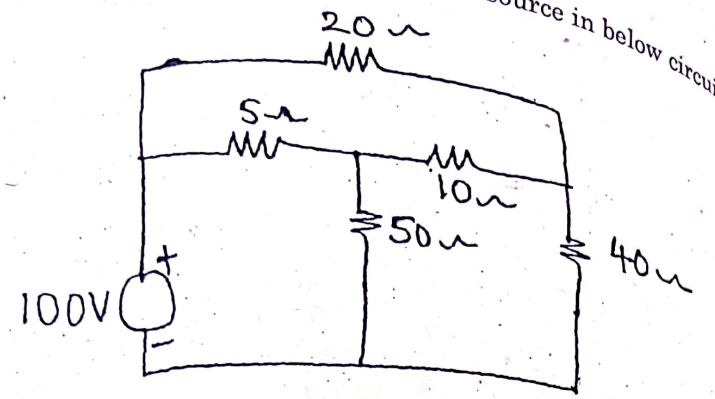


(b) Describe mesh analysis with an example.

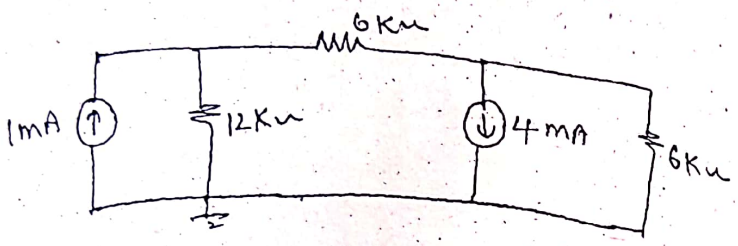
Or

Turn Over

3. (a) What is the power supplied by the 100 V source in below circuit?



(b) Find the node voltages in the below circuit.



UNIT II

4. (a) Explain the working of a moving iron ammeter.

(b) Draw and represent every part of a Cathode Ray Tube.

Or

5. (a) Describe about electric and magnetic fields.

(b) Explain the working of a regulated power supply.

UNIT III

6. (a) Distinguish between P type and N type semiconductors.

(b) Explain the working of LED.

Or

7. (a) Explain the V-I characteristics of PN function diode in forward and reverse bias.

(b) Draw and explain about the energy band diagrams of intrinsic and extrinsic semiconductors.

UNIT IV

8. (a) Explain the working of a bridge rectifier.

   (b) Explain the working of any two clamper circuits.

Or

9. (a) Explain the working of a shunt voltage regulator.

   (b) Explain the working of an inductor filter with a full wave rectifier.

UNIT V

10. (a) How does a Zener diode work as a voltage regulator?

    (b) Explain the working of following

    (i) Photo diode

    (ii) Varactor diode

Or

11. (a) Draw and explain the input and output characteristics of CB configuration of BJT.

    (b) Explain the working of Schottky diode.

RU20 Regulations

B.TECH I SEMESTER END EXAMINATIONS, DECEMBER 2023
C PROGRAMMING & DATA STRUCTURES (20AES0501T)
(Common to CSE and MEC)

Time: 3 Hours | Max. Marks: 70

PART-A (10 X 2 = 20 M)
(Compulsory Question)

Answer the following.

		Unit	Marks
1	a) Differentiate variable and constant with an example.	I	(2 M)
	b) Write about while loop with an example.	I	(2 M)
	c) What is the need of break statement ? explain with an example.	II	(2 M)
	d) What is call by value and call by reference ?	II	(2 M)
	e) Define recursion.	III	(2 M)
	f) Define macro. Write an example macro.	III	(2 M)
	g) Write some predefined string function available in C.	IV	(2 M)
	h) Write use of seek() function.	IV	(2 M)
	i) What are the operations we can performed on stacks?	V	(2 M)
	j) Define graph.	V	(2 M)

PART-B (5 X 10 = 50 M)
(Answer One FULL Question from each Unit; All questions carry EQUAL marks)

UNIT-I

2 Explain different types of storages classes available in C. (10 M)

(OR)

3 Write a C program that illustrates the use else if ladder. (10 M)

UNIT-II

4 Explain about different types of operators available in C. (10 M)

(OR)

5 Differentiate while and do loop with suitable examples. (10 M)

UNIT-III

6 Define array. Write a C program to add elements of an arrray and display the sum. (10 M)

(OR)

7 Write a recursive function to find the factorial of a given number. (10 M)

UNIT-IV

8 Define structure and write a C program that illustrates the usage of array of structures. (10 M)

(OR)

9 Explain how files are handled in C. (10 M)

UNIT-V

10 Write a C program that implements any two operations on singly linked lists. (10 M)

(OR)

11 Explain in detail about Graph representation techniques (10 M)

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20AES0501T

B.Tech. DEGREE EXAMINATION, FEBRUARY/MARCH 2023

Second Semester

C PROGRAMMING AND DATA STRUCTURES

(Common to CIV and ECE)

Time : 3 Hours *Max. Marks : 70*

PART— A

(Compulsory Question)

Answer the following. (10 × 2 = 20 Marks)

1. (a) Define constant. Write rules for constructing integer constant.
   (b) Write different types of operators available in C.
   (c) Explain conditional operator with an example.
   (d) Differentiate continue and break statements.
   (e) Define macro write an example.
   (f) Define pointer write one example.
   (g) Define structure.
   (h) Write operations on files.
   (i) Define stack. Write an algorithm to push an element into the stack.
   (j) Define BST.

PART — B

Answer ONE full question from each unit; All questions carry equal marks.

(5 × 10 = 50 Marks)

UNIT I

2. Write short notes on data types and their sizes available in C. (10)

Or

3. Write a C program that illustrates the usage of else-if ladder. (10)

UNIT II

4. Write a C program to display armstrong numbers between 1 and 100. (10)

Or

5. Define function write a function that find product of two numbers and return value to main program. (10)

Turn Over

UNIT III

6. Define recursion. Write a recursive function to find factorial of a given number. (10)

Or

7. Explain different types of arrays available in C with example. Write how they declare in C also. (10)

UNIT IV

8. Define string and write a C program to find the length of the string without using standard library. (10)

Or

9. Define Queue and write algorithms for queue operations. (10)

UNIT V

10. Define Graph. Write in how many times we represent graphs in computer. (10)

Or

11. Define graph and explain DFS with an example. (10)

26-08-2021
RU20 Reg

B.Tech I Semester End Examinations, 2021

CHEMISTRY (20ABS5101T)

(Common to I Semester CSE & ECE)

Time: 3 Hours | Max. Marks: 70

PART-A (10 x 2 = 20M)

(Compulsory question)

Answer the following			Unit	Marks
1	a)	What is Planks quantum theory?	I	2
	b)	Calculate the bond order of N_2 molecule	I	2
	c)	What is super conductor? Give examples	II	2
	d)	Mention the important the applications of carbon nanotubes	III	2
	e)	What is an electrochemical sensor?	III	2
	f)	Mention the applications of fuel cells	III	2
	g)	What is coordination polymerisation?	IV	2
	h)	What are conducting polymers? Give examples	IV	2
	i)	Mention any four regions of electromagnetic spectrum used in spectroscopy	V	2
	j)	What is R_f value?	V	2

PART- B (5 x 10 = 50M)

Answer One Full Question from each Unit; All questions carry equal marks		
	UNIT-I	
2	Write a note on a) Dual nature of matter b) significance of ψ and ψ^2	10
	OR	
3	Draw the MO energy level diagram for O2 and CO molecule	10
	UNIT-II	
4	Discuss the crystal field splitting of d-orbitals in tetrahedral and octahedral complexes	10
	OR	
5	What are salient features of band theory? draw the band diagrams of conductors , semiconductors and insulators	10
	UNIT-III	
6	What is conductometric titration? Illustrate various types of conductrometric titrations	10
	OR	
7	a) Discuss the working of Li-ion battery with necessary equations b) Explain the working of glucose potentiometric sensor	10

	UNIT-IV	
8	Discuss the mechanism of addition polymerisation	10
	OR	
9	a) Write the differences between thermoplastics thermosetting polymers b) Discuss the preparation and properties of Buna-S rubber	10
	UNIT-V	
10	What is the principle of IR spectroscopy? Mention the selection rules for harmonic oscillator and applications of IR spectroscopy	10
	OR	
11	Write a detailed note on Thin Layer Chromatography	10

31-01-2020

19-ABS-9904

B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2020.

First Semester

ENGINEERING CHEMISTRY

(Common to First semester CSE and Second Semester ECE, CE and ME)

(RU 19 Regulations)

Time : 3 Hours *Max. Marks : 70*

PART — A

Answer the following

(Compulsory Question) **(10 × 2 = 20 Marks)**

1. (a) Distinguish Scales and sludges.
   (b) Why the reverse osmosis is more advantageous than Electro dialysis process?
   (c) Give two examples of Thermosetting polymers.
   (d) Mention the uses of Elastomers
   (e) Define Calorific value
   (f) Why CNG is better than LPG?
   (g) Describe Electrochenhical cell with examples.
   (h) What is a flue gas give example
   (i) What is the role of Gypsum in manufacture of Portland Cement.
   (j) Mention the functions of Lubricants.

PART — B

Answer ONE full question from each Unit; All questions carry Equal marks.

(5 × 10 = 50 Marks)

UNIT I

2. Discuss the internal treatment methods for softening of water.

Or

3. Describe the demineralization process of softening of hard water.

UNIT II

4. Distinguish thermosetting and thermoplastics polymers.

Or

5. Describe the preparation methods, Properties and applications of Nylon 6,6.

Turn Over

UNIT III

6. What is synthetic petrol? How it can be manufactured, explain with neat sketch?

Or

7. What are coking coals? Explain the manufacture of Coke by Otto Hoffman's Process?

UNIT IV

8. Explain the principle, working of a Fuel cell with the help of an example and Give the applications of fuel cell.

Or

9. Describe the principle and working of Li-ion batteries

UNIT V

10. What is the composition of Cement? Explain the manufacturing process of cement with neat sketch.

Or

11. Explain the mechanism of different types of Lubrication

16-11-2021

SET-1

RAYALASEEMA UNIVERSITY COLLEGE OF ENGINEERING, KURNOOL

B.Tech II Semester End Examinations, November 2021

ENGINEERING CHEMISTRY (20ABS5 102T)

(Common to CIV & MEC)

Time: 3 Hours | Max. Marks: 70

PART-A (10 x 2 = 20 M)

(Compulsory Question)

Answer the following.

1. a) What is the principle behind internal treatment of water?
   b) What is Reverse Osmosis?
   c) Discuss differential aeration corrosion.
   d) What are the limitations of standard hydrogen electrode?
   e) What are elastomers? Give its applications.
   f) What kind of polymers act as conducting polymers.
   g) Discuss the failure of refractories.
   h) What is fire and flash points of lubricants? Mention their importance.
   i) What is colloid? How is micelle formed?
   j) What is catalysis? Also give BET equation.

PART-B (5 x 10 = 50 M)

(Answer One FULL Question from each Unit; All questions carry EQUAL marks)

UNIT-I

2. Explain (i) breakpoint chlorination (ii) electrodialysis

(OR)

3. Write about Bureau of Indian Standards (BIS) and World Health Organization (WHO) standards.

UNIT-II

4. Define corrosion. Discuss electrochemical theory of corrosion.

(OR)

5. Explain the working of (i) calomel electrode (ii) Ni-Cd cell with a neat sketch.

UNIT-III

6. What is a polymer? Explain the influence of mechanical properties on polymers.

(OR)

7. Write notes on (i) petrol knocking (ii) natural gas.

UNIT-IV

8. Explain the manufacturing of Portland cement.

(OR)

9. Write notes on classification of refractories and discuss their properties.

UNIT-V

10. What are nanomaterials? Explain the preparation of nanoparticles by sol-gel method.

(OR)

11. Explain about (i) solid-gas interface (ii) solid-liquid interface

12-05-22 FN

RAYALASEEMA UNIVERSITY COLLEGE OF ENGINEERING, KURNOOL

B.Tech II Semester (RU19) Supplementary Examinations, MAY 2022

Engineering Chemistry (19ABS9904)

(Computer Science & Engineering)

Time: 3 Hours | Max. Marks: 70

PART-A (10 X 2 = 20 M)

(Compulsory Question)

Answer the following.

			Marks
1	a)	How do you differentiate between temporary and Permanent Hardness?	(2 M)
	b)	Give the main advantage of reverse osmosis over electro dialysis of water?	(2 M)
	c)	What are the monomers involved in the preparation of Buna-S?	(2 M)
	d)	Give any two applications of Poly acetylene?	(2 M)
	e)	Distinguish between GCV and NCV.	(2 M)
	f)	What is meant by Natural gas?	(2 M)
	g)	What is the function of Electrochemical Cell?	(2 M)
	h)	Give Nernst equation? Expand the various terms in Nernst equation.	(2 M)
	i)	What is the role of gypsum in cement?	(2 M)
	j)	Define term Lubrication?	(2 M)

PART-B (10 X 2 = 20 M)

(Answer One FULL Question from each Unit; All questions carry EQUAL marks)

UNIT-I

2 What are scales and sludges? How can they be removed in boilers by internal treatment methods? (10 M)

(OR)

3 Describe the process of Ion Exchange resin in softening of water with its applications. (10 M)

UNIT-II

4 Write preparation, properties and engineering applications of
a) Nylons b) Bakelite (10 M)

(OR)

5 a) Differentiate between addition and condensation polymerization?
b) Write any five differences between thermoplastic and thermosetting resins? (10 M)

UNIT-III

6 Describe in brief the manufacture of coke by Otto-Hoffmann's process with recovery of by-products. (10 M)

(OR)

7 Discuss the Knocking and its relation to the chemical constituents of a Petrol Engine. (10 M)

UNIT-IV

8 What are fuel cells? Discuss the functioning of H_2-O_2 fuel cell and its applications? (10 M)

(OR)

9 Write a note on (i) potentiometric titrations (ii) Calomel Electrode (10 M)

UNIT-V

10 Describe the manufacturing process of Portland cement with neat sketch? (10 M)

(OR)

11 Explain the following properties of lubricants. Give their significance (10 M)
(i) Cloud & Pour point (ii) Saponification value
(iii) Anilene point (iv) Flash & fire point (v) Viscosity Index

12-05-2022 FN

RAYALASEEMA UNIVERSITY COLLEGE OF ENGINEERING, KURNOOL

B.Tech II Semester (RU20) Supplementary Examinations, MAY 2022

ENGINEERING CHEMISTRY (20ABS5102T)

(Common to Civil Engineering & Mechanical Engineering)

Time: 3 Hours | Max. Marks: 70

PART-A **(10 X 2 = 20 M)**

(Compulsory Question)

Answer the following			**Marks**
1	a)	Define break-point chlorination and state its significance.	(2 M)
	b)	What is brackish water?	(2 M)
	c)	What is an Electrochemical Cell?	(2 M)
	d)	State and explain pilling-Bed worth rule?	(2 M)
	e)	What is meant by Calorific value of a fuel?	(2 M)
	f)	What is meant by Knocking?	(2 M)
	g)	Why anti oxidants are added to Hydro carbon oils?	(2 M)
	h)	Write any two applications of Composite materials?	(2 M)
	i)	Which Colloidal system is represented by butter?	(2 M)
	j)	Discuss any two applications of nano materials.	(2 M)

PART-B **(5 X 10 = 50 M)**

(Answer One FULL Question from each Unit; All questions carry EQUAL marks)

UNIT-I

2 What is the principle of EDTA method? Explain the determination of hardness of water sample by EDTA method? (10 M)

(OR)

3 What is reverse osmosis? How sea water is purified by reverse osmosis? Give the main advantage of reverse osmosis over electro dialysis of water? (10 M)

UNIT- II

4 What are fuel cells? Discuss the functioning of H_2-O_2 fuel cell and its applications. (10 M)

(OR)

5 Explain in detail that factors influence the rate of corrosion? (10 M)

UNIT-III

6 Write preparation, properties and engineering applications of (i) PVC an (ii) Bakelite (10 M)

(OR)

7 Explain proximate analysis of coal and give its significance? (10 M)

UNIT-IV

8 Describe the manufacturing process of Portland cement with neat sketch? (10 M)

(OR)

9 What is refractory? Mention the classification of refractory's with examples? Give the reasons for its failure? (10 M)

UNIT-V

10 Describe the various methods to synthesis of colloids. (10 M)

(OR)

11 Describe the synthesis of nano particles by Sol-Gel method. (10 M)

13-05-2022 FN

RAYALASEEMA UNIVERSITY COLLEGE OF ENGINEERING, KURNOOL

B.Tech I Semester (RU20) Regular & Supple. Examinations, MAY 2022

CHEMISTRY (20ABS5101T)

(Common to CSE & ECE)

Time: 3 Hours | Max. Marks: 70

PART-A (10 X 2 = 20 M)

(Compulsory Question)

Answer the following. Marks

1 a) Calculate the bond order for N2 molecule. (2 M)
b) Write the significance of ψ, ψ^2? (2 M)
c) How the conductivity of metals and semi conductors effect with temperature? (2 M)
d) Give any two applications of Fullerenes. (2 M)
e) Give the applications of Lithium ion cell? (2 M)
f) What is the function of Electrochemical Cell? (2 M)
g) Why Teflon is highly chemical resistant? (2 M)
h) Write the preparation of PVC? (2 M)
i) Define wave length. What are its units? (2 M)
j) Define Beer-Lamberts Law? (2 M)

PART-B (10 X 2 = 20 M)

(Answer One FULL Question from each Unit; All questions carry EQUAL marks)

UNIT-I

2 Draw the molecular orbital diagrams for CO and NO molecules (10 M)

(OR)

3 Write a note on: (i) Schrodinger equation (ii) Dual nature of matter (10 M)

UNIT-II

4 Explain the band theory of solids? Explain P-type and n-type semiconductor? (10 M)

(OR)

5 Explain in detail the salient features of CFT. Draw the crystal field splitting in the tetrahedral complexes? (10 M)

UNIT-III

6 What are fuel cells? Discuss the functioning of H_2-O_2 fuel cell and its applications? (10 M)

(OR)

7 Explain in detail Conductometric titrations? (10 M).

UNIT-IV

8 Write preparation, properties and engineering applications of (10 M)
a) Nylon-6 6 b) Bakelite

(OR)

9 a) Differentiate between addition and condensation polymerization? (5 M)
b) Write any five differences between thermoplastic and thermosetting resins? (5 M)

UNIT-V

10 Explain the instrumentation of IR spectroscopy with the help of neat sketch?. (10 M)

(OR)

11 Write short note on: (10 M)
(a) Applications of UV spectroscopy (b) Thin Layer Chromatography

RAYALASEEMA UNIVERSITY COLLEGE OF ENGINEERING, KURNOOL

B.Tech I Semester (RU19) Supplementary Examinations, MAY 2022

Engineering Chemistry (19ABS9904)

(Computer Science & Engineering)

Time: 3 Hours | Max. Marks: 70

PART-A (10 X 2 = 20 M)

(Compulsory Question)

		Marks
Answer the following.		
1 a)	What is hardness? How it is expressed?	(2 M)
b)	Define break-point chlorination and state its significance.	(2 M)
c)	Differentiate between addition and condensation polymerization?	(2 M)
d)	What are the monomers involved in the preparation of Nylon 6,6?	(2 M)
e)	Distinguish between GCV and NCV.	(2 M)
f)	What is the Composition of Natural Gas?	(2 M)
g)	What is the function of Electrochemical Cell?	(2 M)
h)	Give the applications of Zinc air cell?	(2 M)
i)	What is the role of gypsum in cement?	(2 M)
j)	Define Lubricant?	(2 M)

PART-B (5 X 10 = 50 M)

(Answer One FULL Question from each Unit; All questions carry EQUAL marks)

UNIT-I

2 What is the principle of EDTA method? Explain the determination of hardness of water sample by EDTA method? (10 M)

(OR)

3 Describe the process of Ion Exchange resin in softening of water with its applications. (10 M)

UNIT-II

4 Write preparation, properties and engineering applications of (10 M)
(i) Buna-S (ii) Bakelite

(OR)

5 What are Conducting polymers? Explain its mechanism. (10 M)

UNIT-III

6 Describe in brief the manufacture of coke by Otto-Hoffmann's process with recovery of by-products. (10 M)

(OR)

7 What is Synthetic Petrol? Describe its manufacturing process by Fisher-Tropesh and Bergius process. (10 M)

UNIT-IV

8 What are fuel cells? Discuss the functioning of H_2-O_2 fuel cell and its applications. (10 M)

(OR)

9 Describe Construction and working of Reference Electrodes? (10 M)

UNIT-V

10 Explain the setting and hardening of cement with necessary equations? (10 M)

(OR)

11 Explain the following properties of lubricants. Give their significance (10 M)
(i) Cloud & Pour point (ii) Saponification value
(iii) Aniline point (iv) Flash & fire point (v)Viscosity Index

20ABS5101T

B.Tech DEGREE EXAMINATION, FEBRUARY/MARCH 2023

First Semester

ENGINEERING CHEMISTRY

(RU20 Regulations)

Time : 3 Hours *Max. Marks : 70*

PART — A

(Compulsory Question)

1. Answer the following. **(10 × 2 = 20)**

   (a) Explain significance of Ψ and Ψ^2.

   (b) What are π-molecular orbital's?

   (c) Define Co ordination number?

   (d) What are nano materials?

   (e) What is Nernst equation?

   (f) What are Na-Air batteries?

   (g) What are monomers?

   (h) What are carbon fibers?

   (i) Principle of TLC.

   (j) What is R_f value?

PART — B

(Answer One FULL questions from each Unit. All questions carry equal marks)

(5 × 10 = 50)

UNIT I

2. Explain molecular orbital theory, bonding in homo and hetero-nuclear diatomic molecules.

Or

3. Discuss in detailed about energy level diagrams of CO and NO.

UNIT II

4. Describe the Properties of coordination compounds, oxidation state, coordination number, magnetic properties.

Or

5. Describe the band diagrams for conductors.

UNIT III

6. Explain Specific, equivalent and molar conductance and cell constant.

Or

7. Define potentiometric sensors and describe the Estimation of Uric Acid.

UNIT IV

8. Describe the Preparation, properties and applications of— PVC, Teflon, and Bakelite.

Or

9. Describe the mechanism of conduction and applications.

UNIT V

10. What is Beer-Lambert's law and discuss about IR spectroscopy?

Or

11. Explain Solid-Liquid Chromatography and TLC.

RU20 Regulations

RAYALASEEMA UNIVERSITY COLLEGE OF ENGINEERING, KURNOOL

B.Tech I Semester End Examinations – 2023

Chemistry (20ABS5101T)

(Common to I Semester CSE & ECE)

Time: 3 Hours | Max. Marks: 70

PART-A (10 X 2 = 20 M)

(Compulsory Question)

Answer the following.

		Unit	Marks
1 a)	What is dual nature of matter?	I	(2 M)
b)	Explain the Schrodinger equation?	I	(2 M)
c)	What are conductors?	II	(2 M)
d)	What are nano materials?	II	(2 M)
e)	What is Electrochemical cell?	III	(2 M)
f)	What are fuel cells?	III	(2 M)
g)	What is Bakelite?	IV	(2 M)
h)	What is meant by polymerization?	IV	(2 M)
i)	What is radiation?	V	(2 M)
j)	Define principle of TLC?	V	(2 M)

PART-B (5X 10 = 50 M)

(Answer One FULL Question from each Unit; All questions carry EQUAL marks)

UNIT-I

2 Discuss Planck's quantum theory and what is the significance of Ψ and Ψ^2? (10 M)

(OR)

3 Discuss in detailed about molecular orbital theory? (10 M)

UNIT-II

4 What is Crystal field theory and explain the Properties of coordination compounds? (10 M)

(OR)

5 Describe the classification of nano materials, properties and applications of fullerenes? (10 M)

UNIT-III

6 What are the Reference Electrodes, Electrochemical Cells and describe the concept of conductivity? (10 M)

(OR)

7 Describe the Working of the Batteries including Cell Reactions and potentiometric sensors? (10 M)

UNIT-IV

8 Describe the Preparation, Properties and Applications of Buna-S and Buna-N? (10 M)

(OR)

9 Describe the Preparation, properties and applications of – PVC, Bakelite, Nylon-6,6? (10 M)

UNIT-V

10 What Is Absorption of radiation and explain Beer-Lambert's law? (10 M)

(OR)

11 Discuss in detailed about Solid-Liquid Chromatography? (10 M)

20ABS5401

B.Tech. DEGREE EXAMINATION, FEBRUARY 2023.

First Semester

LINEAR ALGEBRA AND CALCULUS

(Common to I Semester CE, CSE, ECE and ME)

Time : 3 Hours *Max. Marks : 70*

PART — A

Answer the following. **(10 × 2 = 20 Marks)**

(Compulsory questions)

1. (a) Find the value of b if the rank of the matrix $\begin{vmatrix} 1 & 3 & 4 \\ 0 & 3 & 2 \\ b & 13 & 10 \end{vmatrix}$ is 2.

(b) If $A = \begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$ choose α and β so that $(\alpha I + \beta A)^2 = A$.

(c) State Cauchy's mean value theorem.

(d) State Mclaurin's theorem.

(e) If $u = \sin^{-1}\left(\frac{x}{y}\right) + \tan^{-1}\left(\frac{y}{x}\right)$ then find the value of $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y}$.

(f) Explain about the total derivative in partial differentiation.

(g) Evaluate $\int_0^{\pi} \int_0^{a(1+\cos\theta)} r^2 \cos\theta \, dr \, d\theta$.

(h) $\int_1^2 \int_0^1 \int_{-1}^1 (x^2 + y^2 + z^2) \, dz \, dy \, dx$.

(i) Prove that $\gamma\left(\frac{1}{2}\right) = \sqrt{\pi}$.

(j) Prove that $\int_0^{\infty} \frac{x^a}{a^x} dx$.

Turn Over

All questions carry equal marks.

UNIT I

2. Find the Eigen values and corresponding eigen vectors for the matrix $\begin{pmatrix} 6 & -2 & 2 \\ -2 & 3 & -1 \\ 2 & -1 & 3 \end{pmatrix}$. (10)

Or

3. Verify Cayley – Hamilton theorem for the matrix $A = \begin{pmatrix} 2 & 1 & 1 \\ 0 & 1 & 0 \\ 1 & 1 & 2 \end{pmatrix}$ and hence find the value (10)

$A^8 - 5A^7 + 7A^6 - 3A^5 + A^4 - 5A^3 + 8A^2 - 2A + 1$.

UNIT II

4. (a) State and prove Rolle's mean value theorem. (5)

(b) Let $g(x) = x^3$ $x \geq 0$ show that g satisfies rolle's theorem in [0, 3]. (5)

Or

5. (a) Find the Mclaurin's series for $x \cos x$. (5)

(b) Check the validity of Cauchy's mean value theorem for the functions $f(x) = x^3$, $g(x) = \sqrt{x}$ in [1, 2]. (5)

UNIT III

6. (a) If $x^2 + y^3 - 2axy = 0$ find $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$. (5)

(b) If $x = \frac{u}{v}, y = \frac{u-v}{u+v}$ find $\frac{\partial(u, v)}{\partial(x, y)}$. (5)

Or

7. (a) What error in the common logarithm of a number will be produced by an error of 1% in the number. (5)

(b) Find the absolute maximum and minimum value of $f(x, y) = 2 + 2x + 2y - x^2 - y^2$. (5)

UNIT IV

8. Find the area outside the circle $r = 2$ and inside the cardioids $r = a(1 + \cos\theta)$. (10)

Or

9. Find the volume bounded above by the sphere $x^2 + y^2 + z^2 = a^2$ and below by the cone $x^2 + y^2 = z^2$. (10)

UNIT V

10. (a) Evaluate $\int_{-1}^{1} (1+x)^{p-1} (1-x)^{q-1} dx$. (5)

(b) Show that $\gamma(n)\gamma(1-n) = \frac{\pi}{\sin n\pi}$. (5)

Or

11. Derive relation between Beta and Gamma functions. (10)
