

7/7/23



END TERM EXAMINATION
School of Engineering & IT

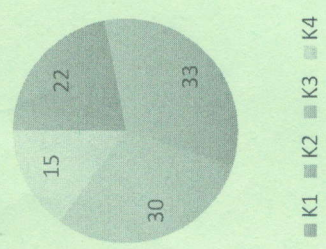
Branch	Electrical and Electronics Engineering	Program	B.Tech
Subject Name	Digital Electronics	Semester	IV
		Year	2023/ Even
Time: 3 Hour Max. Marks: 70	<ul style="list-style-type: none"> Start writing from 2nd page onwards; don't write on the 1st Page Backside Answer all Questions of Section A (Compulsory) Answer Any Four out of Six of Section B Answer Any Three out of Five of Section C Possession of <u>Mobile Phones</u> or any kind of <u>Written Material, Arguments with the Invigilator or Discussing with Co-Student</u> will come under <u>Unfair Means</u> and will <u>Result in the Cancellation of the Papers.</u> 		
Knowledge Level (KL)	K1 : Remembering K2 : Understanding	K3 : Applying K4 : Analysing	K5 : Evaluating K6 : Creating

CO- Course Outcomes, **KL- Knowledge Level,** **PO – Program Outcome**

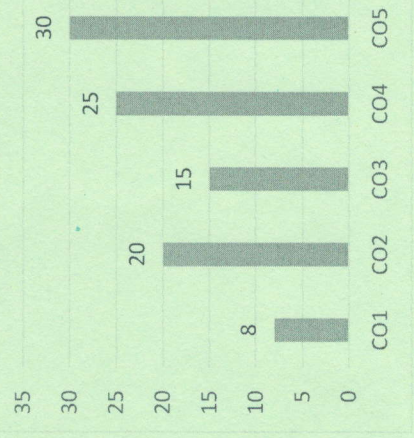
CO1	Identify the fundamental concepts and techniques used in digital electronics.
CO2	Understand the process of Analog to Digital conversion and Digital to Analog conversion.
CO3	Apply the defined technique to structure various number systems.
CO4	Examine the structure of various number systems and its application in digital design.
CO5	Interpret the use of PLDs to implement the given logical problem.
CO6	Design and implement Combinational and Sequential logic circuits.

GRAFICAL REPRESENTATION

Bloom's Level Wise Marks Distribution



Course Outcomes Wise Marks Distribution



Q.N1	QUESTIONS	Marks	COs	KL	PO
i	If the decimal number is a fraction then its binary equivalent is obtained by _____ the number continuously by 2.	2	CO2	K1	PO2
ii	List the types of Number System	2	CO2	K2	PO1
iii	What are Minterm and Maxterm?	2	CO1	K1	PO3
iv	Which code is called as minimum change code and why?	2	CO2	K1	PO2
v	Write the applications of Multiplexer (MUX)?	2	CO1	K1	PO4
vi	What are the characteristics of Transistor Transistor Logic (TTL)?	2	CO1	K2	PO2
vii	What are the fundamental properties of Boolean algebra?	2	CO2	K1	PO5
viii	What is meant by K-Map or Karnaugh Map?	2	CO1	K1	PO6
ix	Which gates are called as Universal gate and what are its advantages?	2	CO2	K1	PO12
x	What is the binary number system?	2	CO1	K1	PO11

Section B (Answer any FOUR out of SIX) – 20 Marks

(Each question 5 Marks)


Q. No.	QUESTIONS	Marks	COs	KL	PO
2	Convert the following : i. (2598.675) ₁₀ to () ₁₆ ii. (756.603) ₈ to () ₁₆	5	CO2	K5	PO3
3	Write short note on DE multiplexer.	5	CO2	K4	PO2
4	Compare Combinational Circuit and Sequential Circuit.	5	CO3	K4	PO12
5	Classify different types of Counters and Explain any one of them.	5	CO3	K4	PO1
6	Explain the following Logic Gates with diagram and Truth Table. i. NAND Gate ii. NOR Gate	5	CO4	K4	PO2
7	Write a short note on Gray Code.	5	CO3	K4	PO1

Section C (Answer any THREE out of FIVE) – 30 Marks-

(Each question Carry 10 Marks)

Q. No.	QUESTIONS	Marks	COs	KL	PO
8	Minimize the following Boolean expression by use of the Karnaugh map. $X = B\bar{C} + B\bar{D} + AB + AD + AC + C\bar{D}$	10	CO5	K3	PO2
9	Explain in brief Programmable Array Logic (PAL)	10	CO5	K5	PO1
10	Explain the operation of a SR latch	10	CO4	K6	PO2
11	Discuss the basic concepts in state machine analysis.	10	CO4	K2	PO1 PO12
12	What is TTL logic family and CMOS family? Which one is faster TTL or CMOS?	10	CO5	K3	PO2 PO3

6/7/23

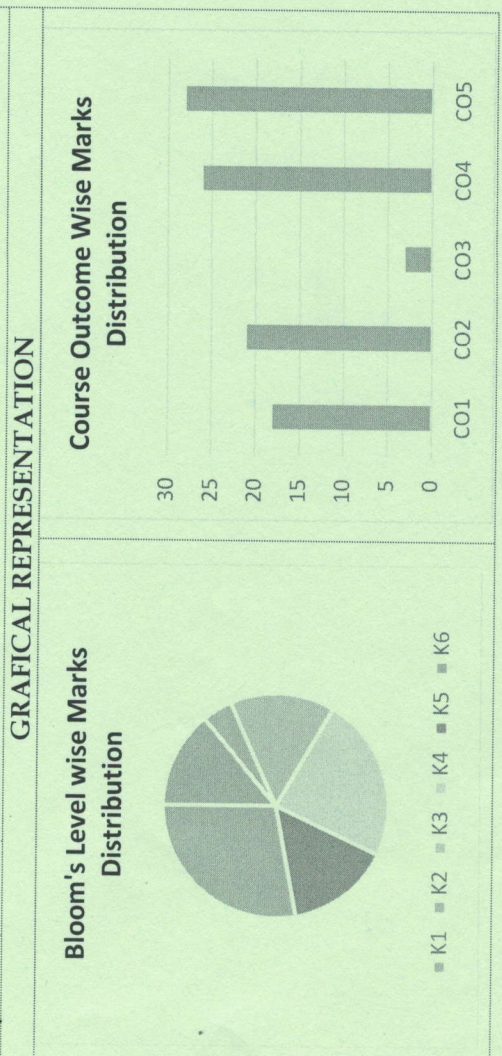


ARKAJAIN
University
Jharkhand

END TERM EXAMINATION
School of Engineering & IT

Branch	Electrical & Electronics Engineering	Program	B. Tech
Subject Name	Electrical Machines-II	Semester	IV
Time: 3 Hour Max. Marks : 70	<ul style="list-style-type: none"> Start writing from 2nd page onwards; don't write on the 1st Page Backside Answer all Questions of Section A (Compulsory) Answer Any Four out of Six of Section B Answer Any Three out of Five of Section C Possession of Mobile Phones or any kind of Written Material, Arguments with the Invigilator or Discussing with Co-Student will come under <u>Unfair Means</u> and will <u>Result in the Cancellation of the Papers.</u> 		
Knowledge Level (KL)	K1 : Remembering K2 : Understanding	K3 : Applying K4 : Analysing	K5 : Evaluating K6 : Creating

CO- Course Outcomes,	KL- Knowledge Level,	PO – Program Outcome
CO1	Recognize different electrical machine.	
CO2	Understand the operation of ac machines.	
CO3	Apply the concepts of rotating magnetic fields to find characteristics of Induction motor.	
CO4	Ability to conduct experiments on Ac Machines to find the Characteristics	
CO5	Evaluate performance characteristics of ac machines	



Section A (Each question Carry 01 Marks from Q1-i to Q1-x) – 10 Marks

Q. N1	QUESTIONS	Marks	COs	KL	PO
i	Why starter are necessary?	2	CO1	K2	PO2
ii	Write down the characteristics of synchronous motor?	2	CO2	K1	PO3
iii	Why the starting torque of Squirrel cage induction motor is low?	2	CO5	K4	PO4
iv	What are the advantages of short pitch winding?	2	CO2	K1	PO3
v	What are the effects of increasing rotor resistance on starting current and starting torque?	2	CO1	K4	PO2
vi	Write the application of salient pole type rotor and non- salient type rotor?	2	CO3	K3	PO1
vii	What is the condition for maximum torque in induction motor	2	CO3	K1	PO3
viii	What are the applications of synchronous motor?	2	CO3	K2	PO4
ix	A 4 pole, 3 phase, 50 Hz induction motor runs at a speed of 1470 r.p.m. speed. Find the frequency of the induced e.m.f in the rotor under this condition	2	CO5	K5	PO2
x	How the magnitude of rotor emf is related to the slip in an induction motor?	2	CO4	K1	PO4

Section B (Answer any FOUR out of SIX) – 20 Marks
(Each question 5 Marks)

Q.No.	QUESTIONS	Marks	COs	KL	PO
2	What is slip? Derive the relationship between fundamental fluency and rotor frequency.	5	CO1	K2	PO5
3	Determine the pitch factor for winding: 36 stator slot, 4-pole, coil span 1 to 8.	5	CO3	K4	PO3
4	Derive the expression of torque of induction motor	5	CO2	K4	PO1
5	Drive the relationship between copper losses power input and mechanical power developed in induction motor	5	CO5	K4	PO4
6	A three phase 4 pole 50 Hz induction motor runs at 750 rpm. Find (i) slip speed, (ii) per unit slip (iii) frequency of rotor current	5	CO2	K5	PO5
7	Difference between salient and non-salient pole machine?	5	CO5	K5	PO2

Section C (Answer any THREE out of FIVE) – 20 Marks
(Each question Carry 10 Marks)

Q.No.	QUESTIONS	Marks	COs	KL	PO
8	Effect of varying excitation of synchronous motor with constant load	10	CO5	K4	PO4
9	The power input to the rotor of 440 V, 50 Hz, 6-pole, 3-phase, induction motor is 80 kW. The rotor electromotive force is observed to make 100 complete alterations per minute. Calculate (i) the slip, (ii) the rotor speed, (iii) rotor copper losses per phase.	10	CO1	K5	PO2
10	A 3 phase, 50 Hz, 8 pole alternator has a star connected winding with 120 slots and 8 conductors per slot. The flux per pole is 0.05 wb, sinusoidal distributed. Determine the phase and line voltages.	10	CO1	K5	PO4

11 Explain principle operation with net sketch of DOL starter.

10

CO2

K4

PO2

12 A 100KVA, 3-phase-star connected 3000V, 50 Hz, alternator has effective armature resistance of 0.2 ohm. The field current 40A produces short-circuit current of 200A and an open circuit emf of 1040V (line value). Calculate the full load voltage regulation at 0.8p.f lagging.

10

CO1

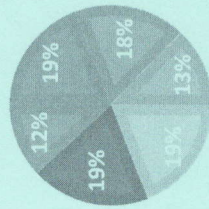
K5

PO3

CO- Course Outcomes,	KL- Knowledge Level,	PO – Program Outcome
CO1	Recognize sampling theorem and its implications.	
CO2	Understand the concepts of continuous time and discrete time systems.	
CO3	Solve systems in complex frequency domain.	
CO4	Analyze the discrete time signals and system using different transform domain techniques.	
CO5	Evaluate the various signal responses.	
CO6	Design and implement LTI filters for filtering different real world signals.	

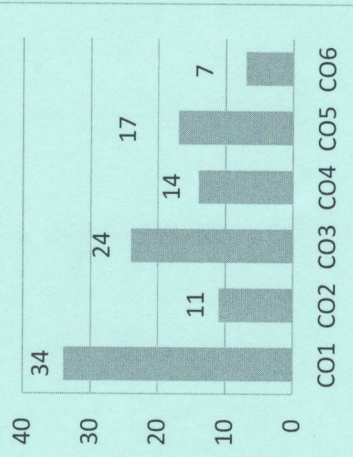
GRAPHICAL REPRESENTATION

BLOOM'S LEVEL WISE MARKS DISTRIBUTION



■ K1 ■ K2 ■ K3 ■ K4 ■ K5 ■ K6

Course Outcome Wise Marks Distribution



Branch	Electrical and Electronics Engineering	Program	B. Tech
Subject Name	Signals & Systems	Semester	IV
		Year	2022/Even
Time: 3 Hour	<ul style="list-style-type: none"> Start writing from 2nd page onwards; don't Write on the 1st Page Backside Answer all Questions of Section A (Compulsory) Answer Any Four out of Six of Section B Answer Any Three out of Five of Section C Possession of <u>Mobile Phones</u> or any kind of <u>Written Material, Arguments with the Invigilator or Discussing with Co-Student</u> will come under <u>Unfair Means</u> and will <u>Result</u> in the <u>Cancellation of the Papers</u>. 		
Max. Marks : 70			
Knowledge Level (KL)	K1 : Remembering K2 : Understanding	K3 : Applying K4 : Analysing	K5 : Evaluating K6 : Creating

Section A (Each question Carry 02 Marks from Q1-i to Q1-xx) – 20 Marks

Q. N1	QUESTIONS	Marks	Cos	KL	PO
i	What is an even signal?	2	CO1	K2	PO1
ii	Give the expression for Fourier transform and inverse Fourier transform.	2	CO3	K5	PO2
iii	Explain the usefulness of the Z-transform.	2	CO2	K5	PO2
iv	Write the expression for Z-transform and inverse Z-transform.	2	CO3	K5	PO2
V	What is scaling and technique of scaling	2	CO2	K6	PO1
vi	Explain with an example, the folding property.	2	CO2	K2	PO1
vii	What is Nyquist rate?	2	CO4	K6	PO1
viii	Define the term aliasing.	2	CO4	K4	PO1
ix	Write the mathematical equation for signum function.	2	CO5	K5	PO2
x	State any two property of a LTI system.	2	CO6	K4	PO1

Section B (Answer any FOUR out of SIX) - 20 Marks

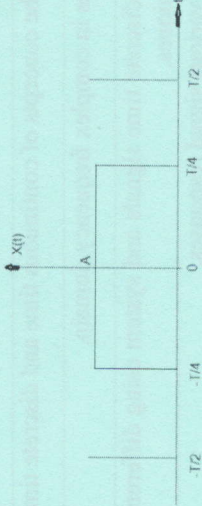
(Each question 5 Marks)

Q. No.	QUESTIONS	Marks	Cos	KL	PO
2	Prove that the sine wave is a periodic signal.	5	CO1	K6	PO1
3	If $X_1(n) = \delta(n+1) + 2\delta(n) + \delta(n-1)$ $X_2(n) = 3\delta(n+1) + 5\delta(n) + 3\delta(n-1)$. Determine $X(n)$ by any method, where $X(n)$ is the convolution of $X_1(n)$ and $X_2(n)$.	5	CO3	K5	PO2
4	Find the convolution of the signal $x(n) = (1, 2, 2, 4)$ where impulse response of the signal is $h(n) = (3, 4, 2, 1)$ using formula method.	5	CO3	K3	PO2
5	Determine the Z-transform of any two of the following finite duration signals. a) $x(n) = \{2, 4, 5, 7, 0, 1, 2\}$ b) $x(n) = \{1, 2, 5, 4, 0, 1\}$	5	CO2	K4	PO2
6	Discuss the properties of the DFT.	5	CO5	K1	PO1
7	Define briefly: a) Even and odd signal b) Deterministic and random signal	5	CO6	K2	PO1

Section C (Answer any THREE out of FIVE) - 30 Marks-

(Each question Carry 10 Marks)

Q. No.	QUESTIONS	Marks	Cos	KL	PO
8	Explain the following standard signals with mathematical expression and graphical representation: a) unit step signal b) Signum function c) Exponential signal d) Unit ramp signal	10	CO1	K1	PO1
9	Draw the waveforms represented by the following step functions: a) $f_1(t) = 2u(t-1)$ b) $f_2(t) = -2u(t-2)$ c) $f(t) = f_1(t) + f_2(t)$ d) $f(t) = f_1(t) - f_2(t)$	10	CO1	K2	PO1

10	Obtain the Fourier series representation of the given periodic rectangular waveform.	10	CO3	K4	PO2
					
11	Find the DFT of the sample data sequence $x(n) = \{1, 1, 2, 2, 3, 3\}$ and compute the corresponding amplitude and phase spectrum.	10	CO4	K4	PO2
12	Find the 4-point DFT of the sequence $x(n) = \cos n\pi/4$	10	CO5	K5	PO2

8/7/23



END TERM EXAMINATION
School of Engineering & IT

Branch	Electrical & Electronics Engineering	Program	B.Tech
Subject Name	Power Electronics	Semester	IV
		Year	2022/ Even
Time: 3 Hour Max. Marks: 70	<ul style="list-style-type: none"> Start writing from 2nd page onwards; don't Write on the 1st Page Backside Answer all Questions of Section A (Compulsory) Answer Any Four out of Six of Section B Answer Any Three out of Five of Section C Possession of <u>Mobile Phones</u> or any kind of <u>Written Material, Arguments with the Invigilator or Discussing with Co-Student</u> will come under <u>Unfair Means</u> and will <u>Result in the Cancellation of the Papers.</u> 		
Knowledge Level (KL)	K1 : Remembering	K3 : Applying	K5 : Evaluating
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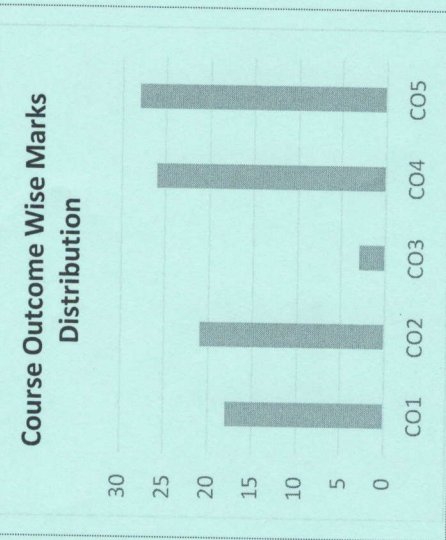
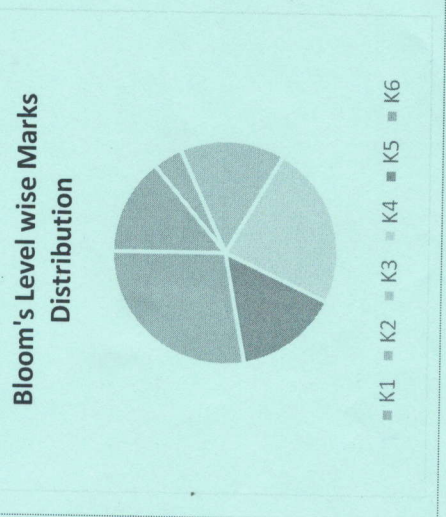
Section A (Each question Carry 02 Marks from Q1-i to Q1-x) – 20 Marks

Q. N1	QUESTIONS	Marks	COs	KL	PO
i	Mention few applications of Power Electronics.	2	CO1	K1	PO2
ii	Describe briefly Snubber Circuit with suitable circuit diagram.	2	CO3	K2	PO1
iii	Draw the Structure & Symbol for SCR & its VI characteristics.	2	CO5	K2	PO3
iv	Mention two Power Semiconductor Devices with their ratings.	2	CO4	K6	PO2
v	Define Latching current.	2	CO4	K3	PO4
vi	What is cycloconverter?	2	CO3	K1	PO2
vii	Draw the circuit diagram for Type-E Chopper Circuit.	2	CO5	K6	PO5
viii	Define Holding Current.	2	CO1	K5	PO6
ix	What is AC Voltage Controller?	2	CO1	K1	PO12
x	What is the output voltage equation for Buck converter & Boost converter DC Chopper?	2	CO2	K2	PO11

CO- Course Outcomes, **KL-** Knowledge Level, **PO** – Program Outcome

CO1	Recall the operation of DC-DC choppers.
CO2	Understand the differences between signal level and power level devices.
CO3	Apply the concept of commutation to turn off converter circuits.
CO4	Analyze the operation of voltage source inverters.
CO5	Choose suitable power electronic devices by assessing the requirements of application fields.

GRAPHICAL REPRESENTATION



Section B (Answer any FOUR out of SIX) – 20 Marks

(Each question 5 Marks)

Q. No.	QUESTIONS	Marks	COs	KL	PO
2	Explain the various advantages & disadvantages of Power Electronic Systems?	5	CO2	K2	PO5
3	Explain Class B Commutation with suitable circuit diagram & waveforms.	5	CO3	K1	PO4
4	Elaborate Resistance-Capacitance firing circuit with suitable circuit diagram & waveforms.	5	CO5	K3	PO1
5	Explain the working of Single-Phase Half-wave Circuit with RL Load with proper circuit diagram & waveforms.	5	CO1	K4	PO5
6	Explain the Type-D Chopper Circuit.	5	CO5	K5	PO2
7	Explain the working of Three-Phase full Wave diode rectifier circuit with proper waveforms.	5	CO3	K2	PO3

Section C (Answer any THREE out of FIVE) – 30 Marks-

(Each question Carry 10 Marks)

Q. No.	QUESTIONS	Marks	COs	KL	PO
8	Explain in detail about the 180-degree mode of conduction of 3-ph Inverter.	10	CO2	K1	PO11
9	Explain the working of Single-Phase Half Wave SCR controlled rectifier circuit with R-L load and also R-L-E load with proper waveforms.	10	CO1	K2	PO4
10	Write short note on DC Choppers. Explain the working of Step-Up Chopper circuit with proper waveforms.	10	CO1	K3	PO5
11	Explain in detail about the 120-degree mode of conduction of 3-ph Inverter.	10	CO4	K5	PO2
12	Explain the working of Single-Phase full Wave SCR controlled rectifier circuit with R-L-E load with & without freewheeling diode with proper waveforms.	10	CO5	K4	PO12



Branch	Electrical & Electronics Engineering	Program	B.TECH
Subject Name	Essence of Indian Knowledge & Tradition	Semester	IV
		Year	2023/ EVEN

- Start writing from 2nd page onwards; don't Write on the 1st Page Backside
- Answer all Questions of Section A (Compulsory)
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- Possession of Mobile Phones or any kind of Written Material, Arguments with the Invigilator or Discussing with Co-Student will come under Unfair Means and will Result in the Cancellation of the Papers.

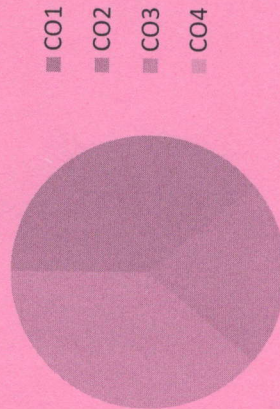
Time: 1:30
Hour Max.
Marks : 35

Knowledge Level (KL)	K1 : Remembering	K3 : Applying	K5 : Evaluating
	K2 : Understanding	K4 : Analysing	K6 : Creating

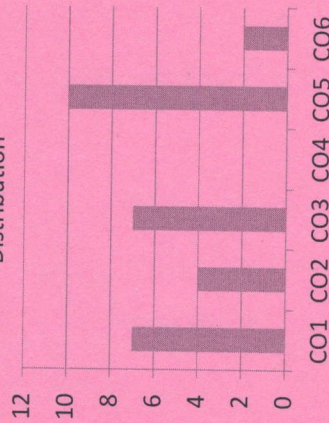
CO- Course Outcomes,	KL- Knowledge Level,	PO – Program Outcome
CO1	Label thought process, reasoning and inference.	
CO2	Understand the Indian Knowledge Systems and Indian perspective of modern scientific world-view.	
CO3	Focus on Indian philosophical traditions, Indian linguistic tradition and Indian artistic tradition.	
CO4	Understand, connect up and explain basics of Indian Traditional knowledge modern scientific perspective	
CO5	Assess basic principles of Yoga and holistic health care systems	
CO6	Generate awareness to Indian society for historic Indian culture	

GRAFICAL REPRESENTATION

Bloom's Level Wise Marks Distribution



Course Outcome wise Marks Distribution



Section A (Each question Carry 1 Marks from Q1-i to Q1-x) - 10 Marks

Q. N 1	QUESTIONS	Marks	COs	KL	PO
i	What do you mean by Veda?	1	CO1	K1	PO2
ii	Name any one mantra associated with Rig veda	1	CO1	K2	PO1
iii	Which Vedanga is known as Vedpurush's mouth?	1	CO2	K1	PO3
iv	Which Veda is known as the knowledge of Archery?	1	CO1	K1	PO1
v	What are the objectives of Ayurveda?	1	CO4	K1	PO1
vi	The word jyotisha refers to.....	1	CO6	K3	PO4
vii	Name the person who compiled the Vedas?	1	CO5	K2	PO6
viii	Give two teachings of Sama Veda.	1	CO2	K4	PO7
ix	Name any one Purana.	1	CO3	K3	PO3
x	In Sanskrit, Mimasa is known as	1	CO6	K3	PO5

Section B (Answer any Five out of SIX) – 10 Marks
(Each question 2 Marks)

Q.No.	QUESTIONS	Marks	COs	KL	PO
2	Write any two characteristics of Indian traditional knowledge?	2	CO6	K3	PO2
3	Which Veda is known as the knowledge of Sacrifices?	2	CO4	K5	PO5
4	Name the four upvedas.	2	CO3	K2	PO4
5	What is the aim and purpose of the Dhanurveda?	2	CO3	K3	PO6
6	Write the difference between early purana and later purana.	2	CO2	K6	PO7
7	According to Ayurveda, salyatantra deals with	2	CO4	K6	PO9

Section C (Answer any THREE out of FIVE) – 15 Marks-
(Each question Carry 5 Marks)

Q.No.	QUESTIONS	Marks	COs	KL	PO
8	What are the basic principles of Ayurvedic medicines ?	5	CO1	K1	PO3
9	What are the benefits of Yoga?	5	CO5	K3	PO3
10	What is Yajur veda?	5	CO2	K3	PO7
11	What do you know about Atharva Veda?	5	CO2	K3	PO8
12	What do you know about Dhanurveda ?	5	CO4	K4	PO9

CO- Course Outcomes,

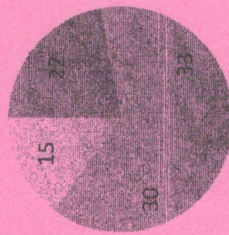
KL- Knowledge Level,

PO – Program Outcome

CO1	Identify the fundamental concepts and techniques used in digital electronics.
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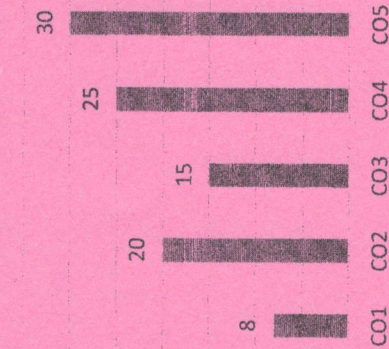
GRAFICAL REPRESENTATION


Bloom's Level Wise Marks Distribution



■ K1 ■ K2 ■ K3 ■ K4

Course Outcomes Wise Marks Distribution



 ARKAJAIN University Jharkhand		END TERM EXAMINATION School of Engineering & IT	
Branch	Electrical and Electronics Engineering & Mechanical Engineering	Program	B. Tech
Subject Name	Biology For Engineers	Semester	IV
		Year	2023/ Even
Time: 3 Hour Max. Marks: 70	• Start writing from 2nd page onwards; don't Write on the 1st Page Backside • Answer all Questions of Section A (Compulsory) • Answer Any Four out of Six of Section B • Answer Any Three out of Five of Section C • Possession of <u>Mobile Phones</u> or any kind of <u>Written Material, Arguments with the Invigilator or Discussing with Co-Student</u> will come under <u>Unfair Means</u> and will <u>Result</u> in the <u>Cancellation of the Papers.</u>		
Knowledge Level (KL)	K1 : Remembering	K3 : Applying	K5 : Evaluating
	K2 : Understanding	K4 : Analysing	K6 : Creating

Section A (Each question Carry 02 Marks from Q1-i to Q1-xx) – 20 Marks

Q. N	QUESTIONS	Marks	COs	KL	PO
1					
i	What are the three dominoes (Kingdoms) of life?	2	CO1	K1	PO2
ii	Give two names of engineers with their discovery who won Nobel prize in biology and chemistry field?	2	CO1	K2	PO1
iii	Give any one example of bio mimicry by human made application.	2	CO2	K2	PO1 0
iv	What are polysaccharides?	2	CO6	K2	PO1
v	What is meiosis?	2	CO2	K2	PO2
vi	List the two types of lipids and their functions?	2	CO1	K1	PO6
vii	How many types of nucleic acids are there? And write any two functions.	2	CO1	K3	PO1
viii	Draw a neat diagram of DNA double helix structure?	2	CO1	K1	PO1
ix	What do you understand by lock and key of enzyme?	2	CO4	K2	PO5

x	What do you understand by gene mapping?		2	CO1	K1	PO1
	<u>Section B (Answer any FOUR out of SIX) - 20 Marks</u> (Each question 5 Marks)					
Q. No.	QUESTIONS	Marks	COs	KL	PO	
2	Define buffer solution. Discuss the Role of Buffer Solution in human body giving proper mechanism.	5	CO4	K3	PO5	
3	What do you understand by meiosis and mitosis with the help of diagram	5	CO2	K1	PO1	
4	Explain role of RNA, DNA and Nucleotide in living organism.	5	CO1	K1	PO2	
5	Explain about hierarchy classification of living organism.	5	CO2	K2	PO5	
6	Write Short Notes on: a) Prokaryotes and Eukaryotes b) Unicellular and Multicellular	5	CO3	K2	PO6	
7	What are carbohydrates? Classify and explain mono saccharides.	5	CO6	K3	PO1 0	

Section C (Answer any THREE out of FIVE) - 30 Marks-
(Each question Carry 10 Marks)

Q. No.	QUESTIONS		Marks	COs	KL	PO
	8	What are the functions & Structure of Proteins?	10	CO4	K2	PO5
9	Explain about Sugar, Starch and Cellulose	10	CO5	K2	PO6	
10	Define Mendel's laws and explain the concept of segregation and independent assortment.	10	CO2	K2	PO1	
11	Define Biosensor. What are the components of biosensor explain with proper diagrammatic explanation? Write applications of biosensor.	10	CO1	K3	PO2	
12	Write a note on biosafety and various techniques used.	10	CO3	K4	PO5	