



NARASARAOPETA ENGINEERING COLLEGE (AUTONOMOUS)

III B. Tech II Semester Supple Examinations, April-2023

ENTREPRENEURSHIP & INNOVATION

Electrical and Electronics Engineering

Sub Code: 19BCC6TH01

Time: 3 Hrs

Max. Marks: 60

Note: This question paper Consists of 5 Sections. Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 12 marks

SECTION-I		
1	A) Elucidate the historical evolution of Entrepreneurship in India. B) Debate the role of Entrepreneurship in Economic Development	[12M]
OR		
2	A) Elaborate the Social Responsibilities of Entrepreneurs B) Describe the characteristics of Entrepreneurs.	[12M]
SECTION-II		
3	A) Examine the key characteristics of Innovations. B) Write about the key factors affecting the Creativity.	[12M]
OR		
4	A) Present the steps in Creativity. B) Critically discuss the Innovations.	[12M]
SECTION-III		
5	A) Outline the various Entrepreneurship Development Programmes B) List out the limitations of Entrepreneurship Development Programmes	[12M]
OR		
6	A) Examine the various steps involved in designating the Entrepreneurship Development Programmes. B) Discuss the key qualities of Entrepreneurship Trainers.	[12M]
SECTION-IV		
7	A) Illustrate the various Project Evaluation Techniques. B) Outline the criteria for Project Selection.	[12M]
OR		
8	A) Write a short note on Project Feasibility Study B) Differentiate between NPV and IRR.	[12M]
SECTION-V		
9	A) Critically evaluate the characteristics of MSME's. B) Trace the reasons for Industrial Sickness.	[12M]
OR		
10	A) Suggest the various remedies for Industrial Sickness. B) List out the various Policies and Programmes of Ministry of MSME.	[12M]

III B.Tech II Semester Supple. Examinations, April-2023

Sub Code: 19BCC6OE01 SOLID & HAZARDOUS WASTE MANAGEMENT

Time: 3 hours

(CE)

Max. Marks: 60

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks (5 X 12 = 60M)

Q.No	Questions	KL	CO	M			
UNIT-I							
1	a	Discuss various goals and objectives of solid waste management.			2	1	6
		Discuss the factors that affect the generation of solid wastes.			2	1	6
	OR						
	b	Municipal solid waste is generated within the community from several sources, not just the household. List and discuss these sources.			2	1	6
	Explain the adverse health and environmental impacts due to improper handling of solid waste.			3	1	6	
UNIT-II							
2	a	Discuss 'Optimization of Collection Routes' with special reference to Environmental aspects.			3	2	6
		Identify the activities responsible for successful implementation of collection system.			2	2	6
	OR						
	b	With neat sketches, explain different types of transfer stations			2	2	6
	List out the factors to be considered in selecting solid waste collection equipment?			2	2	6	
UNIT-III							
3	a	Describe the design and operation of a sanitary landfill with a neat sketch.			3	3	12
	OR						
	b	Propose a recycling strategy for wastes from a residential area.			3	3	6
	Identify the adverse effects of a landfill leachate and list appropriate control measures.			2	3	6	
UNIT-IV							
4	a	Explain the anaerobic methods for material recovery and treatment.			2	4	6
		Discuss 'Source Reduction Methods' in India Vs Developed countries.			3	4	6
	OR						
b	Briefly discuss the various methods of composting with suitable example.			3	4	12	
UNIT-V							
5	a	Discuss the plastic recycling facilities improving the way they deal with waste?			3	5	6
		Explain the health hazards of E-waste management			2	5	6
	OR						
	b	Explain re-use and recycling of plastic waste			2	5	6
	Discuss the E-waste Handling Techniques?			2	5	6	

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M: Marks

III B.Tech II Semester Supple. Examinations, April-2023

Sub Code: 19BCC6OE03

SOFT COMPUTING

Time: 3 hours

(EEE)

Max. Marks: 60

Note: Answer All FIVE Questions.

All Questions Carry Equal Marks (5 X 12 = 60M)

Q.No	Questions	KL	CO	M			
Unit-I							
1	a	i) Explain the principles of Artificial Neuron Models.			2	1	6M
		ii) Explain briefly about Mc Culloch Pitts model with logic center.			3	1	6M
	OR						
	b	i) Explain briefly about spiking neuron model.			4	1	6M
ii) Write about supervised and unsupervised learning rules with examples.			2	1	6M		
Unit-II							
2	a	Explain the working of back propagation neural network with near architecture and flowchart.			2	2	12M
		OR					
	b	i) Explain different activation functions in neural networks.			4	2	6M
		ii) Write a brief note on selection of parameters in BP networks.			2	2	6M
Unit-III							
3	a	i) Compare and contrast classical logic and fuzzy logic.			4	3	6M
		ii) Discuss in detail the operations and properties of fuzzy sets.			2	3	6M
	OR						
	b	i) Explain about Fuzzy Rule based system with example.			2	3	4M
ii) Define defuzzification? Explain briefly about different defuzzification methods.			4	3	8M		
Unit-IV							
4	a	i) State the importance of genetic algorithm and explain it's working principle.			2	4	6M
		ii) With a neat flowchart, explain the operation of simple genetic algorithm.			3	4	6M
	OR						
	b	i) What are various types of crossover and mutation techniques?			4	4	6M
ii) Discuss in brief about the concept of encoding and fitness function.			4	4	6M		
Unit-V							
5	a	Explain how GA can be applied for economic load dispatch in power systems?			3	5	12M
		OR					
b	Discuss the application of soft computing techniques in electrical load forecasting.			3	5	12M	

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M: Marks



NARASARAOPETA ENGINEERING COLLEGE (AUTONOMOUS)

III B.Tech II Semester Supple. Examinations, April-2023

Sub Code: 19BEC6PE05

ELECTRONIC MEASUREMENTS AND INSTRUMENTATION

Time: 3 hours

(ECE)

Max. Marks: 60

Note: Answer All FIVE Questions.

All Questions Carry Equal Marks (5 X 12 = 60M)

Q.No	Questions	KL	CO	M
Unit-I				
1	i) Explain the terms: Static Error, Static Correction, Relative Error, and Percentage Relative Error.	K1	1	6M
	a ii) What is the range of error in the current? The expected value of voltage across a resistor is 100 V. However, the voltmeter reads a value of 99 V. Calculate absolute error, % error, relative error, and % accuracy.	K2	1	6M
	OR			
	b i) A $270 \Omega \pm 10\%$ resistance is connected to a power supply source operating at 300 V dc. What range of current would flow if the resistor varied over the range of $\pm 10\%$ of its expected value?	K2	1	6M
	ii) Define and explain dynamic characteristics.	K1	1	6M
Unit-II				
2	a i) Explain the method of measuring displacement using LVDT. State the advantages and disadvantages of LVDT.	K2	2	7M
	ii) State the advantages and disadvantages of thermocouples	K2	2	5M
	OR			
	b i) List different types of strain gauges. Explain with the help of diagram the various bonded strain gauges.	K2	2	6M
	ii) How capacitive transducers used for the measurement of humidity? Show the interface of the amplifier to it.	K3	2	6M
Unit-III				
3	a i) A Maxwell–Wien bridge consists of the following: Arm AB having resistance value of 1.6 kW in parallel with a capacitor of 2 mF Arm BC having resistance value of 600 W Arm AD having resistance value of 400 W Arm BD having resistance and inductance in series. Determine the value of the unknown resistance and unknown inductance.	K3	3	6M
	ii) Derive the balanced condition for the kelvin double bridge.		3	6M
	OR			
	b i) A steel diaphragm is used for pressure measurement. It is 50 mm in diameter and is to be designed to measure a maximum pressure of 1.5 MN/m ² . The modulus of elasticity of steel is 200 GN/m ² and Poisson's ratio is 0.3. Calculate the thickness of diaphragm in order that the maximum deflection is not more than 1/3 of its thickness. Calculate the natural frequency of diaphragm. The density of steel is 7800 kg/m ³ .	K3	3	6M
	ii) Explain the working principle of the PMMC with a neat sketch.	K2	3	6M
Unit-IV				
4	a i) Draw a block diagram of RF signal generator and explain its operation.	K2	4	6M
	ii) Describe with the help of a neat block diagram the working of a standard signal Generator. State the limitations of a standard signal generator.	K2	4	6M
	OR			
	b i) Explain Distortion analyzer with its construction diagram.	K2	4	6M
	ii) List advantages and disadvantages of a spectrum analyzers.	K2	4	6M

Unit-V					
5	a	i) A voltmeter is accurate to 98% of its full-scale reading. If a voltmeter reads 200 V on 500 V range, what is the absolute error?	K3	5	5M
		ii) Construct and explain the special Oscilloscope.	K3	5	7M
	OR				
	b	i) Describe with a diagram and waveforms the operation of a dual trace CRO in alternate and Chop mode. State the functions of each block.	K2	5	6M
ii) Construct a DC voltmeter for 3 ranges of measurement using PMMC and give the general circuit disadvantage.		K4	5	6M	

III B.Tech II Semester Supple. Examinations, April-2023

Sub Code: 19BEE6PE07

CONTROL OF ELECTRICAL DRIVES

Time: 3 hours

(EEE)

Max. Marks: 60

Note: Answer All FIVE Questions.

All Questions Carry Equal Marks (5 X 12 = 60M)

Q.No	Questions	KL	CO	M			
Unit-I							
1	a	i) Explain the different components of basic electrical drive system			K1	1	6M
		ii) What is steady state stability of electric drives and explain it briefly.			K1	1	6M
	OR						
	b	i) Describe in detail the various components of load torque			K1	1	12M
Unit-II							
2	a	i) With neat circuit diagrams and waveforms, explain the operation of single phase fully controlled rectifier fed separately excited dc motor.			K1	2	6M
		ii) A 220 V, 1500 rpm, 10 A separately excited motor has an armature resistance of 2 . The motor is driven from a single-phase fully-controlled rectifier operating in continuous conduction mode. The input is rated at 230V, 50Hz. Calculate firing angle of the controlled rectifier if the motor runs at 600 rpm developing rated torque.			K2	2	6M
	OR						
		b	i) Explain the operation of four quadrant chopper fed to the D.C separately excited motor and also draw the current and voltage wave forms for continuous current operation			K2	2
Unit-III							
3	a	Draw and explain the speed-torque curves with variable frequency control for two different modes. (i) Operation at constant flux. (ii) Operation at constant (v/f) ratio.			K1	3	12M
		OR					
		b	i) Describe the working of static scherbius drive in detail.			K1	3
	ii) Explain the closed loop operation of induction motor drive using suitable block diagram.			K1	3	6M	
Unit-IV							
4	a	i) Describe the self controlled modes of operation of a synchronous motor drive in detail			K1	4	6M
		ii) In variable frequency control of a synchronous motor why (V/f) ratio is maintained constant up to base speed and V constant above the base speed. Explain briefly with necessary waveforms.			K2	4	6M
	OR						
		b	i) Describe the closed loop operation of permanent magnet synchronous motor drive in details.			K1	4
	ii) Explain margin angle control of synchronous motor drive.			K1	4	6M	
Unit-V							
5	a	i) Explain the principle of closed-loop control of a dc drive using suitable block diagram.			K1	5	6M
		ii) Derive the transfer function of DC Motor-load system with armature voltage control.			K2	5	6M

OR					
b	i) List the factors involved in converter selection and equations involved in controller characteristics.	K1	5	6M	
	ii) Discuss the design procedure for current controller of an electric drive.	K1	5	6M	

KL: Blooms Taxonomy Knowledge Level

CO: Course Outcome

M: Marks



NARASARAOPETA ENGINEERING COLLEGE (AUTONOMOUS)

III B.Tech II Semester Supple. Examinations, April-2023

Sub Code: 19BCE6PE08

ALTERNATIVE CONSTRUCTION TECHNOLOGY

Time: 3 hours

(CE)

Max. Marks: 60

Note: Answer All FIVE Questions.

All Questions Carry Equal Marks (5 X 12 = 60M)

Q.No	Questions	KL	CO	M	
1	Unit-I				
	a	i) What are the Requirements for building of different climatic regions.	K2	1	[6M]
		ii) Explain about traditional building methods and vernacular architecture.	K2	1	[6M]
	OR				
	b	i) Explain about environmental friendly and cost effective technologies.	K2	1	[6M]
		ii) What are the mandatory requirements for green buildings.	K2	1	[6M]
2	Unit-II				
	a	i) Write about Bricks and hollow clay blocks	K2	2	[6M]
		ii) Explain about steam cured blocks	K2	2	[6M]
	OR				
	b	i) Explain characteristics of building blocks for walls.	K2	2	[6M]
		ii) Explain about Fal-G Blocks	K2	2	[6M]
3	Unit-III				
	a	i) Write about fibre reinforced plastics.	K2	3	[6M]
		ii) Write the Properties and applications of building materials from Agro and industrial wastes.	K2	3	[6M]
	OR				
		i) Write about Field quality control test methods in detailed.	K2	3	[6M]
		ii) What are the different types of industrial and mine wastes. Write the Properties and applications of industrial and mine wastes.	K2	3	[6M]
4	Unit-IV				
	a	i) Define Ferrocement and also explain Materials and specifications.	K2	4	[6M]
		ii) Write about Construction methods and Applications of Ferrocement.	K2	4	[6M]
	OR				
b	Explain specifications of ferrocement and write properties of ferrocement.	K2	4	[12M]	

Unit-V					
5	a	i) Explain about bond strength of masonry.	K2	4	[6M]
		ii) what are the factors affecting on compressive strength.	K2	4	[6M]
	OR				
	b	i) Explain about flexural and shear strength of masonry elements.	K2	4	[6M]
ii) Write about Elastic properties of masonry Materials and masonry.		K2	4	[6M]	

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M: Marks

III B.Tech II Semester Supple. Examinations, April-2023

Sub Code: 19BCC6OE12

CLOUD COMPUTING

Time: 3 hours

(CSE&IT)

Max. Marks: 60

Note: Answer All FIVE Questions.

All Questions Carry Equal Marks (5 X 12 = 60M)

Q.No	Questions	KL	CO	M	
1	Unit-I				
	a	i) Discuss various essentials of cloud computing	2	1	6M
		ii) Elaborate various benefits of cloud computing	3	1	6M
	OR				
	b	i) State various limitations of cloud computing	2	1	6M
		ii) Elaborate how do you develop cloud infrastructure	3	1	6M
2	Unit-II				
	a	i) Discuss server virtualization	2	2	6M
		ii) Explain client virtualization	2	2	6M
	OR				
	b	i) Discuss key design aspects of cloud architecture	2	2	6M
		ii) Compare grid and cloud computing	3	2	6M
3	Unit-III				
	a	i) Discuss cloud computing sub serve models	2	2	6M
		ii) Explain cloud deployment models	2	2	6M
	OR				
	b	i) Discuss alternative deployment models	2	2	6M
		ii) Explain cloud stack	2	2	6M
4	Unit-IV				
	a	i) Discuss cloud management product	2	3	6M
		ii) Compare cloud provider and traditional IT serve provider	3	3	6M
	OR				
	b	i) Elaborate disaster in the cloud	3	3	6M
		ii) Explain disaster management	2	3	6M
5	Unit-V				
	a	i) Discuss types of Azure clouds	2	4	6M
		ii) Compare tradition Vs Azure cloud model	3	4	6M
	OR				
	b	i) Discuss application of AWS	2	4	6M
		ii) What are disadvantages of AWS	1	4	6M

KL: Blooms Taxonomy Knowledge Level

CO: Course Outcome

M: Marks

III B.Tech II Semester Supple. Examinations, April-2023

Sub Code: 19BCC6OE13 BLOCK CHAIN TECHNOLOGIES

Time: 3 hours

(IT)

Max. Marks: 60

Note: Answer All FIVE Questions.
All Questions Carry Equal Marks (5 X 12 = 60M)

Q.No	Questions	KL	CO	M
	Unit-I			
1	a i) How is Blockchain distributed ledger different from a traditional ledger? Explain your answer.	1	1	6M
	ii) Explain how to Recognize the key business benefits in industry Blockchain.	2	1	6M
	OR			
	b i) What is the difference between Bitcoin blockchain and Ethereum? Explain your answer.	2	1	6M
	ii) Explain with example how to build a trust with blockchain.	1	1	6M
	Unit-II			
2	a i) What are Smart Contracts and how do they work? Explain your answer.	1	2	6M
	ii) Illustrate What Makes a Blockchain Suitable for Business?	2	2	6M
	OR			
	b i) What is a smart contract and list some of its applications? Explain your answer.	2	2	6M
	ii) Explain some of the popular consensus algorithms which you know.	2	2	6M
	Unit-III			
3	a i) Compare Information frictions and Interaction frictions. Give suitable examples for each.	2	3	6M
	ii) Explain with examples how does the Blockchain Technology can Reduces the information friction in business.	3	3	6M
	OR			
	b i) Explain how to Recognize the types of Market Friction.	2	3	6M
	ii) Explain with examples how does the Blockchain Technology can obtain Easing innovation friction in business.	3	3	6M
	Unit-IV			
4	a i) Explain how does the Blockchain Actions differs in Insurance and Healthcare.	2	4	6M
	ii) Explain the Blockchain Action in Cross-border transactions.	1	4	6M
	OR			
	b i) Explain how does the Blockchain Actions differs in Commercial financing and Trade finance.	3	4	6M
	ii) Explain the Blockchain Action in Electronic medical records.	2	4	6M

Unit-V					
5	a	i) Explain how does the Blockchain Offering to an easily accessible cloud and development platform.	3	5	6M
		ii) What is Double Spending? Is it possible to double spend in a Blockchain system?	2	5	6M
	OR				
	b	i) What is Cryptocurrency Mining? Explain how does the Bitcoin mining works?	2	5	6M
ii) Explain with suitable example how does the Bitcoin use Blockchain?		2	5	6M	

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M: Marks



NARASARAOPETA ENGINEERING COLLEGE

(AUTONOMOUS)

III B. Tech II Semester Supple Examinations, April-2023 ENTREPRENEURSHIP & INNOVATION

Sub Code: 19BCC6TH01

Electrical and Electronics Engineering

Max. Marks: 60

Time: 3 Hrs

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<u>SECTION-I</u>		
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OR		
2	A) Elaborate the Social Responsibilities of Entrepreneurs B) Describe the characteristics of Entrepreneurs.	[12M]
<u>SECTION-II</u>		
3	A) Examine the key characteristics of Innovations. B) Write about the key factors affecting the Creativity.	[12M]
OR		
4	A) Present the steps in Creativity. B) Critically discuss the Innovations.	[12M]
<u>SECTION-III</u>		
5	A) Outline the various Entrepreneurship Development Programmes B) List out the limitations of Entrepreneurship Development Programmes	[12M]
OR		
6	A) Examine the various steps involved in designating the Entrepreneurship Development Programmes. B) Discuss the key qualities of Entrepreneurship Trainers.	[12M]
<u>SECTION-IV</u>		
7	A) Illustrate the various Project Evaluation Techniques. B) Outline the criteria for Project Selection.	[12M]
OR		
8	A) Write a short note on Project Feasibility Study B) Differentiate between NPV and IRR.	[12M]
<u>SECTION-V</u>		
9	A) Critically evaluate the characteristics of MSME's. B) Trace the reasons for Industrial Sickness.	[12M]
OR		
10	A) Suggest the various remedies for Industrial Sickness. B) List out the various Policies and Programmes of Ministry of MSME.	[12M]

III B.Tech II Semester Supple. Examinations, April-2023

Sub Code: 19BCE6TH02 IRRIGATION & WATER RESOURCES ENGINEERING

Time: 3 hours

(CE)

Max. Marks: 60

Note: Answer All FIVE Questions.

All Questions Carry Equal Marks (5 X 12 = 60M)

Q.No	Questions	KL	CO	M												
1	I) Define Engineering Hydrology.	K2	1	02												
	ii) A watershed has an area of 200 hectares with 50% occupied by vacant land of 0.25 runoff coefficient, 20% is covered by lawns of 0.3 runoff coefficient, 20% by roads of runoff coefficient 0.6 and by roof surfaces of 0.8 runoff coefficient. The slope of the watershed is 0.003 and the maximum length of travel from the remote point to mouth of the culvert is 1.3 km. The following table shows the rainfall data for 50 year return period storm. Estimate the peak flow to be drained by a culvert for this 50 year storm.	K5	2	10												
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Duration (min)</td> <td style="width: 10%;">15</td> <td style="width: 10%;">30</td> <td style="width: 10%;">45</td> <td style="width: 10%;">60</td> <td style="width: 10%;">80</td> </tr> <tr> <td>Rain (mm)</td> <td>40</td> <td>60</td> <td>75</td> <td>100</td> <td>120</td> </tr> </table>	Duration (min)	15		30	45	60	80	Rain (mm)	40	60	75	100	120		
	Duration (min)	15	30		45	60	80									
	Rain (mm)	40	60	75	100	120										
OR																
b	I) What is Intensity-Duration-Frequency Curve? How is it developed?	K2	3	07												
	ii) The average annual rainfall of 5 rain gauges in a basin 890, 540, 450, 410 and 550 mm respectively. How many additional rain gauges are required if it is desired to limit the error to only 10%?	K4	2	05												
2	a) How do you measure evaporation Using Pan and Water Budget?	K2	2	12												
	OR															
	b	I) How is Initial Abstraction considered with the SCS Unit Hydrograph method?	K2	2	05											
		ii) A 6 hr storm produced rainfall intensities of 7, 18, 25, 12, 10 and 3 mm/hr in successive one hour intervals a basin of 800 sq.km. The resulting runoff is observed to be 2640 ha.m. Determine ϕ - index for the basin.	K3	4	07											
3	a	I) Explain the Runoff Estimation using any two Empirical Equations?	K2	2	07											
		ii) What is hydrograph? Draw a single peaked hydrograph and explain its components?	K2	4	05											
	OR															
	b	From the topographical map of a drainage basin the following quantities are observed: Area = 3480 km ² , L= 148 km and L _c = 74 km. The 12 h UHG derived for the basin has a peak ordinate of 155 m ³ /s occurring at 40 h. Determine C _t and C _p for the synthetic unit hydrograph of the basin.	K3	4	12											
4	a	What do you mean by irrigation efficiency? Discuss the different types of irrigation efficiency.	K2	5	06											

	800 m ³ of water is applied to a farmer's rice field of 0.6 hectares. When the moisture content in the soil falls to 40% of the available water between the field capacity (36%) of soil and permanent wilting (15%) of the soil crop combination. Determine the field application efficiency. The root zone depth of rice is 60cm. Assume porosity = 0.4.	K3	6	06
OR				
	I) Explain in detail the participatory irrigation management.	K2	7	08
b	ii) A reservoir with a live storage capacity of 300 million cubic meters is able to irrigate an ayacut of 40000 hectares with 2 fillings each year. The crop season is 120 days. What is the duty?	K3	6	04
5	OR			
	I) Explain how the storage capacity of a reservoir is fixed.	K2	5	05
	ii) Analyze the ways by which the gravity dam fails and also suggest some precautions to prevent these failures.	K5	7	07
	OR			
b	I) Describe the various storage levels of a reservoir.	K2	7	06
	ii) Explain in detail the considerations for site selection for a dam.	K2	7	06

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M: Marks

III B.Tech II Semester Supple. Examinations, April-2023

Sub Code: 19BCE6TH03

FOUNDATION ENGINEERING

Time: 3 hours

(CE)

Max. Marks: 60

Note: Answer All FIVE Questions.

All Questions Carry Equal Marks (5 X 12 = 60M)

Q. No	Questions	KL	CO	Marks
1	a i) Describe with a neat sketch how will you carry out the wash boring method of soil exploration. What are its merits and demerits?	K2	1	[6M]
	a ii) An SPT was conducted in a dense sand deposit at a depth of 20 m, and a value of 48 was observed for N. The density of the sand was 14 kN/m ³ . What is the value of N, corrected for overburden pressure?	K2	1	[6M]
	OR			
	b i) Explain in detail about preparation of soil investigation report including RECORD OF BORING [IS : 1892-1979]	K2	1	[6M]
2	a ii) What is a stability number? What is its utility in the analysis of stability of slopes?	K3	1	[6M]
	a Explain the Culmann's graphical method with neat sketch and Explain how you determine Active and Passive Earth Pressure	K3	2	[12M]
3	OR			
	b Explain the Rankine's theory for various backfill condition to calculate active and passive state earth pressure.	K3	2	[12M]
	a i) Differentiate between general shear failure, punching shear failure, punching shear failure and local shear failure.	K2	3	[4M]
4	a ii) A strip footing, 1 m wide, rests on the surface of a dry cohesion less soil having $\phi = 25^\circ$ and $\gamma = 18$ kN/m ³ . What is the ultimate bearing capacity? What is the value, if there is complete flooding? Assume $N_y = 10$.	K3	3	[8M]
	OR			
5	b Explain Terzaghi's analysis of bearing capacity of soil in general shear failure.	K2	3	[12M]
	a Explain different classifications of piles with neat sketches.	K2	4	[12M]
5	OR			
	b A pile group consisting of 9 piles is arranged in 3 rows with 3 piles in each row. Diameter of each pile is 35 cm and spacing is 1.2m. Length of pile is 10m. The piles are driven completely in clayey soil having unconfined compressive strength of 100kN/m ² . The piles are designed as frictional. Determine the capacity of pile group. Take $\alpha = 0.7$	K3	4	[12M]
5	a Discuss the construction aspects of Well Foundations. What are 'Tilts and Shifts'? What are the remedial measures to control these?	K2	5	[12M]
	OR			
5	b What are the different shapes of wells and draw neat figures? Explain with neat sketch different components of wells and their functions.	K2	5	[12M]

III B.Tech II Semester Supple. Examinations, April-2023

Sub Code: 19BCE6TH04 TRANSPORTATION ENGINEERING

Time: 3 hours

(CE)

Max. Marks: 60

Note: Answer All **FIVE** Questions.
All Questions Carry Equal Marks (5 X 12 = 60M)

Q.No	Questions	KL	CO	M	
Unit-I					
1	a	Discuss the importance of transportation engineering	K2	1	6
		Briefly discuss 1 st twenty-year road development plan?	K2	1	6
	OR				
	b	What are the salient features of the Bombay Road Development Plan? How it differs from Nagpur Plan? Discuss briefly	K2	1	6
	Explain the road development plan 2021 and rural road development plan - vision 2025?	K2	1	6	
Unit-II					
2	a	The speeds of overtaking and overtaken vehicles are 100 and 85 KMPH respectively. Calculate the overtaking side distance (OSD) for (i) One-Way Traffic (ii) Two – way traffic.	K3	2	12
	OR				
	b	An MDR passing through a flat terrain has a horizontal curve of radius equal to 180 m. Design superelevation, assuming suitable data.	K3	2	6
		Define highway Geometric design? Explain various Factors affecting the highway geometric design?	K2	2	6
Unit-III					
3	a	Briefly explain the different types of intersections	K2	3	6
		On a two-lane highway car, A & B are moving at a speed of 40 kmph and 80 kmph. The distance between A & C is 450 m. After an initial hesitation period of the 2-sec driver of A started overtaking operation. The distance between A & B at that time was 30 m. Acceleration of Vehicle A is 1.20 m/Sec ² . The distance between B & A is 25 m. Determine the distance between two cars A & C at the instance of completion of overtaking operation also calculate the desirable length of the overtaking zone.	K3	3	6
	OR				
	b	Discuss the design procedure of Signals with a sketch	K2	3	6
	Define the speed? How is speed categorized? Describe the collection of speed data?	K2	3	6	
Unit-IV					
4	a	Draw a pavement model as per IRC: 37-2012 with different strains developed in flexible pavement layers?	K2	4	6
		Discuss the importance of the CBR test and how it is applicable to the design of the pavement?	K2	4	6
	OR				
	b	Design the pavement for construction of a new bypass with the following data: Two-lane single carriageway Initial traffic in the year of completion of construction: 600 CV/day (sum of both directions) Traffic Growth Rate per Annum: 5 Percent; Design Life: 20 Years; Vehicle Damage Factor: 2.5 (Standard Axles per (Based on axle load survey) commercial Vehicle); Design CBR of Subgrade soil: 10 Percent CBR Below Subgrade 5%.	K3	4	6
	How do you calculate the properties of bituminous materials	K2	4	6	

Unit-V

5	a	Explain the classification of maintenance operations?	K2	5	6
		Briefly discuss the procedure of Water Bound Macadam roads	K2	5	6
	OR				
	b	List the types of failures in pavements	K2	5	6
Explain the importance of earthwork in highway construction?		K2	5	6	

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M: Marks

III B.Tech II Semester Supple. Examinations, April-2023

Sub Code: 19BEE6TH02 MICROPROCESSOR & MICRO CONTROLLERS

Time: 3 hours

(EEE)

Max. Marks: 60

Note: Answer All FIVE Questions.

All Questions Carry Equal Marks (5 X 12 = 60M)

Q.No	Questions	KL	CO	M	
Unit-I					
1	a	i) Draw and explain the architecture of 8086 microprocessor in detail.	2	1	6M
		ii) Discuss the various functions of various general-purpose registers of 8086	2	1	6M
	OR				
	b	i) Draw the block diagram of 8086 and explain the functions of various general-purpose registers	2	1	6M
		ii) Tabulate the differences between microcontroller and microprocessor	2	1	6M
Unit-II					
2	a	i) Draw the block diagram of minimum mode system and present the timing waveform for read and write cycles.	2	2	6M
		ii) Discuss the addressing modes used in 8086 Microprocessor	2	2	6M
	OR				
	b	i) Explain the various instruction formats of 8086 processor with examples?	2	2	6M
		ii) Draw the block diagram of maximum mode system and present the timing waveform for read and write cycles.	2	2	6M
Unit-III					
3	a	i) Explain the various flags of 8051 microcontroller	2	3	6M
		ii) Write an ALP to arrange given set of 'n' numbers in ascending order	2	3	6M
	OR				
	b	i) Construct the procedure to implement FOR Loop & WHILE-REPEAT with an example	3	3	6M
		ii) Write an ALP for finding a maximum value in an array	3	3	6M
Unit-IV					
4	a	i) Explain the interfacing of DMA Controller 8257 with 8086 processor	2	4	6M
		ii) Explain the features of display controller (8279) and how it can be used for interfacing	2	4	6M
	OR				
	b	i) Explain how a stepper motor can be interfaced to microprocessor using 8255A	2	4	6M
		ii) Explain how memory to memory transfer is performed with 8257	2	4	6M
Unit-V					
5	a	i) With a neat figure explain the architecture of 8051 microcontroller	2	5	6M
		ii) Explain the interrupt structure of 8051 microcontroller	2	5	6M
	OR				
	b	i) Explain the significance of synchronous serial communication of 8051 microcontroller	2	5	6M
		ii) Explain the various I/O ports used in 8051 memory organization	2	5	6M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M: Marks

III B.Tech II Semester Supple. Examinations, April-2023

Sub Code: 19BEE6TH03
Time: 3 hours

INTERNET OF THINGS
(EEE)

Max. Marks: 60

Note: Answer All FIVE Questions.
All Questions Carry Equal Marks (5 X 12 = 60M)

Q.No	Questions	KL	CO	M
Unit-I				
1.	Discuss physical design of IOT	2	1	12M
	OR			
	Discuss logical design of IOT	2	1	12M
Unit-II				
2.	Design and develop home automation applications in IOT	3	2	12M
	OR			
	Design and develop health and life style systems in IOT	3	2	12M
Unit-III				
3	Explain network function virtualization	2	3	12M
	OR			
	Compare IOT and MZM	3	3	12M
Unit-IV				
4	a			
	i) Discuss the need for IOT systems management	2	4	6M
	ii) Explain limitation of SNMP	2	4	6M
	OR			
	Discuss IOT system management with NETCONF - YANG	2	4	12M
Unit-V				
5	What is an IOT physical devices and exemplary device	2	5	12M
	OR			
	Discuss python web application framework - DJANGO	2	5	12M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M: Marks

III B.Tech II Semester Supple. Examinations, April-2023

Sub Code: 19BEE6TH04

POWER SYSTEM ANALYSIS

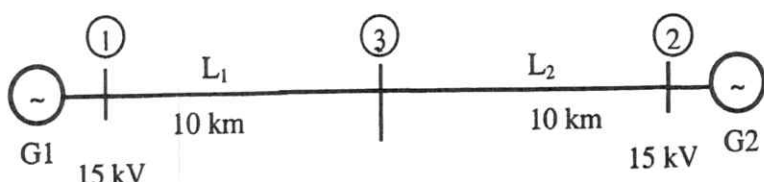
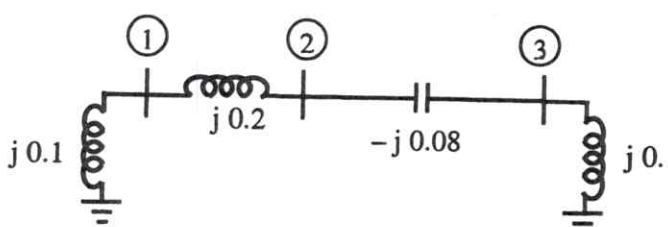
Time: 3 hours

(EEE)

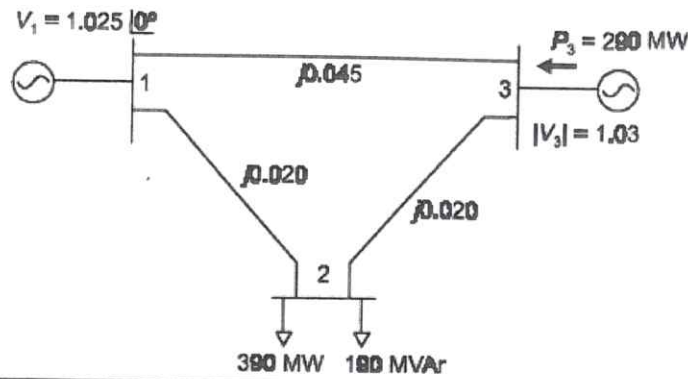
Max. Marks: 60

Note: Answer All FIVE Questions.

All Questions Carry Equal Marks (5 X 12 = 60M)

Q.No	Questions	KL	CO	M
Unit-I				
1	<p>a</p> <p>i) What are the advantages of per unit system</p> <p>ii) Two generators G1 and G2 are connected by 15kV line with a bus at the mid-point as shown below.</p> <div style="text-align: center;">  </div> <p>G1 = 250MVA, 15KV, positive sequence reactance X = 25% on its own base. G2 = 100MVA, 15KV, positive sequence reactance X = 10% on its own base. L₁ and L₂ = 10km, positive sequence reactance x = 0.225Ω/km Draw the positive sequence diagram with the p.u values on the 100MVA common base</p>	K1	1	4M
	<p style="text-align: center;">OR</p> <p>b</p> <p>i) A three bus network is shown in figure below indicating the p.u impedances of each element. Find the Bus admittance matrix Y-bus of the network</p> <div style="text-align: center;">  </div>	K2	1	6M
<p>ii) The bus impedance matrix of a 4-bus power system is given by</p> $Z_{bus} = \begin{bmatrix} j0.3435 & j0.2860 & j0.2723 & j0.2277 \\ j0.2860 & j0.3408 & j0.2586 & j0.2414 \\ j0.2723 & j0.2586 & j0.2791 & j0.2209 \end{bmatrix}$ <p>A branch having an impedance of j 0.2 Ω is connected between bus 2 and the reference. Determine the values of Z_{22,new} and Z_{23,new} of the bus impedance matrix of the modified network.</p>	K2	1	6M	
Unit-II				
2	<p>a</p> <p>i) Define is swing bus and what is the need of swing bus?</p>	K1	2	4M
	<p>ii) Explain the step by step computational procedure for the Newton-Rapson method of load flow studies including PV bus</p>	K1	2	8M
OR				
<p>b</p> <p>i) Figure 2 shows single line diagram of a 3-bus power system. Bus 3 is a PV bus.</p>	K2	2	12M	

Using Gauss-Seidel method and initial assumed voltage $V_2^{(0)} = 1.0 + j0.0$ and $V_3^{(0)} = 1.03 + j0.0$ and keeping $|V_3| = 1.03$ p.u., determine V_2 and V_3 . Perform one iteration

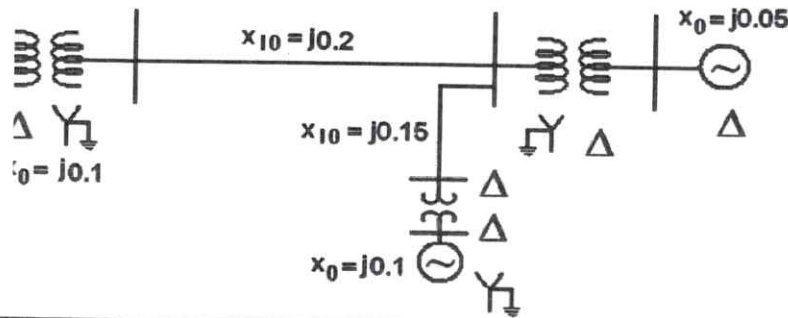


Unit-III

a	i) The short circuit MVA at the bus bars for a power plant A is 1200 MVA and for another plant B is 1000 MVA at 33 KV. If these two are to be interconnected by a tie-line with reactance 1.2 ohm. Determine the possible short circuit MVA at both the plants.	K2	3	6M
	ii) What are symmetrical components? Explain the symmetrical component transformation.	K1	3	

OR

3	i) Derive the expression for power in terms of symmetrical components.	K1	3	6M
	ii) Draw zero sequence network for the system shown in Figure	K2	3	6M



Unit-IV

4	i) Derive an expression for the fault current for a line-to-ground fault at an unloaded generator	K1	4	6M
	ii) The severity of line to ground and three-phase faults at the terminals of an unloaded synchronous generator is to be same. If the terminal voltage is 1.0 pu, $Z_1 = Z_2 = j 0.1$ pu and $Z_0 = j 0.05$ pu for the alternator, Determine the required inductive reactance for neutral grounding.	K2	4	6M

OR

b	i) Derive an expression for the fault current for a line-to-line fault at an unloaded generator	K1	4	6M
	ii) Derive the necessary equations to determine the fault current for a double line to ground fault.	K1	4	6M

Unit-V

5	i) Derive the swing equation for a single machine connected to infinite bus system. State the assumptions if any and state the usefulness of this equation. Neglect the damping.	K1	5	6M
	ii) Two turbo alternators with ratings given below are connected via a short line. Machine 1: 4 pole, 50 Hz, 60 MW, 0.8 p.f lag, moment of inertia 30,000 kg-m ²	K2	5	6M

	Machine 2: 2 pole, 50 Hz, 80 MW, 0.85 p.f lag, moment of inertia 10,000 kg-m ² . Calculate the inertia constant of single equivalent machine on a base of 200MVA			
	OR			
	i) What is equal area criterion? Interpret this for a case when there is a sudden short circuit at one end of one of the line of parallel lines.	K1	5	6M
b	ii) A generator operating at 50Hz delivers 1 p.u power to an infinite bus through a transmission circuit in which resistance is ignored. A fault takes place reducing the maximum power transferable to 0.5p.u whereas before the fault, this power was 2.0 p.u and after the clearance of the fault, it is 1.5 p.u. By the use of equal area criterion, determine the critical clearing angle.	K2	5	6M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M: Marks

III B.Tech II Semester Supple. Examinations, April-2023

Sub Code: 19BME6TH01 COMPLEX VARIABLES, PROBABILITY & STATISTICS

Time: 3 hours

(ME)

Max. Marks: 60

Note: Answer All FIVE Questions.

All Questions Carry Equal Marks (5 X 12 = 60M)

Q.No	Questions	KL	CO	I															
Unit-I																			
1	a	i) Show that $f(z) = z + 2\bar{z}$ is not analytic everywhere in the complex plane.	K3	1	6														
		ii) Show that the function $u = e^{-2xy} \sin(x^2 - y^2)$ harmonic.	K3	1	6														
	OR																		
	b	i) If $f(z)$ is a regular function of z , prove that $\left(\frac{\partial^2}{\partial x^2} + \frac{\partial^2}{\partial y^2}\right) f(z) ^2 = 4 f'(z) ^2$	K3	1	6														
	ii) Find the analytic function $f(z) = u(r, \theta) + iv(r, \theta)$ such that $v(r, \theta) = r^2 \cos 2\theta - r \cos \theta + 2$	K3	1	6															
Unit-II																			
2	a	i) Evaluate $\int_{1-i}^{2+i} (2x + iy + 1) dz$ along the straight line joining $1-i$ and $2+i$.	K3	2	12														
		ii) Using Cauchy's integral formula to Evaluate $\int_C \frac{e^{2z}}{(z+1)^4} dz$, around $C: z-1 =3$	K3	2															
	OR																		
	b	i) Expand $f(z) = \frac{1}{(z-1)(z-2)}$ in the region i) $ z < 1$, ii) $1 < z < 2$.	K3	2	6														
	ii) Using Residue theorem, to evaluate $\int_C \frac{4-3z}{z(z-1)(z-2)} dz$ around $C: z = \frac{3}{2}$	K3	2	6															
Unit-III																			
3	a	i) If $P(A)=1/5, P(B)=2/3, P(A \cap B)=1/15$ find i) $P(A \cup B)$ ii) $P(A^c \cap B)$ iii) $P(A^c \cup B^c)$.	K3	3	6														
		ii) A random variable X has the following probability distribution.	K3	3															
		<table border="1" style="margin: auto;"> <tr> <td>x</td> <td>-2</td> <td>-1</td> <td>0</td> <td>1</td> <td>2</td> <td>3</td> </tr> <tr> <td>p(x)</td> <td>0.1</td> <td>K</td> <td>0.2</td> <td>2K</td> <td>0.3</td> <td>3K</td> </tr> </table>	x	-2	-1	0	1	2	3	p(x)	0.1	K	0.2	2K	0.3	3K			6
	x	-2	-1	0	1	2	3												
p(x)	0.1	K	0.2	2K	0.3	3K													
	Find (i) K (ii) Mean (iii) Variance of X .																		
OR																			
	b	i) The number of monthly breakdowns of a computer is a Random Variable having a Poisson distribution with mean equal to 1.8. Find the probability that this computer will function for a month	K3	3															
		(a) Without a breakdown (b) With only one breakdown and (c) With at least one breakdown.			6														

		ii) If X is normal variate, find the area A (i) to the left of $z = -1.78$ (ii) to the right of $z = -1.45$			6												
	Unit-IV																
4	a	i) If the maximum error is 5 and S.D of population is 80 with 95% confidence, find the sample size?	K3	4	6												
		ii) A random sample of size 100 has a standard deviation of 5. Determine the maximum error with 95% confidence.	K3	4	6												
	OR																
	b	i) A random sample of size 100 is taken from a population with $\sigma = 5.1$. Given that the sample mean is $\bar{x} = 21.6$ Construct a 95% confidence limits for the population mean.	K3	4	6												
ii) In a study of an automobile insurance a random sample of 80 body repair costs had a mean of Rs. 472.36 and the standard deviation of Rs. 62.35. If \bar{x} is used as a point estimate to the true average repair costs, with what confidence we can assert that the maximum error doesn't exceed Rs. 10.		K3	4	6													
	Unit-V																
5	a	i) A sample of 100 students is taken from a large population. The mean height of the students in this sample is 160cm. can it be reasonably regarded that, in the population, the mean height is 165cm, and the SD is 10cm?	K3	5	6												
		ii) A die tossed 960 times and it falls with 5 upwards 184 times. Is the die unbiased at a level of significance of 0.01?	K3	5	6												
	OR																
	b	i) Samples of two types of electric bulbs were tested for length of life and the following data were obtained.	K3	5	6												
<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>Size</th> <th>Mean</th> <th>SD</th> </tr> </thead> <tbody> <tr> <td>Sample 1</td> <td>8</td> <td>1234 h</td> <td>36 h</td> </tr> <tr> <td>Sample 2</td> <td>7</td> <td>1036 h</td> <td>40 h</td> </tr> </tbody> </table> <p>Is the difference in the means sufficient to warrant that type 1 bulbs are superior to type 2 bulbs?</p>			Size	Mean	SD	Sample 1	8	1234 h	36 h	Sample 2	7	1036 h	40 h				
	Size	Mean	SD														
Sample 1	8	1234 h	36 h														
Sample 2	7	1036 h	40 h														
b	ii)) The following data give the number of air-craft accidents that occurred during the various days of a week.	K3	5	6													
	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Day</th> <th>Mon</th> <th>Tues</th> <th>Wed</th> <th>Thu</th> <th>Fri</th> <th>Sat</th> </tr> </thead> <tbody> <tr> <td>No. of accidents</td> <td>15</td> <td>19</td> <td>13</td> <td>12</td> <td>16</td> <td>15</td> </tr> </tbody> </table> <p>Test whether the accidents are uniformly distributed over the week.</p>	Day	Mon	Tues	Wed	Thu	Fri	Sat	No. of accidents	15	19	13	12	16	15		
Day	Mon	Tues	Wed	Thu	Fri	Sat											
No. of accidents	15	19	13	12	16	15											

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M: Marks

III B.Tech II Semester Supple. Examinations, April-2023

Sub Code: 19BME6TH02 DESIGN OF MACHINE ELEMENTS-II

Time: 3 hours

(ME)

Max. Marks: 60

Note: Answer All FIVE Questions.

All Questions Carry Equal Marks (5 X 12 = 60M)

Q.No	Questions	KL	CO	M
Unit-I				
1	a A full journal bearing of 50 mm diameter and 100 mm long has a bearing pressure of 1.4 N/mm ² . The speed of the journal is 900 <i>r.p.m.</i> and the ratio of journal diameter to the diametral clearance is 1000. The bearing is lubricated with oil whose absolute viscosity at the operating temperature of 75°C may be taken as 0.011 kg/m-s. the room temperature is 35°C. Find: 1. The amount of artificial cooling required, and 2. The mass of the lubricating oil required, if the difference between the outlet and inlet temperature if the oil is 10°C. take specific heat of the oil as 1850 J/kg°C.	3	1	12M
	OR			
	b The ball bearings are to be selected for an application in which the radial load is 2000 N during 90 percent of the time and 8000 N during the remaining 10 percent. the shaft is to rotate at 150 <i>r.p.m.</i> determine the minimum value of the basic dynamic load rating for 5000 hours of operation with not more than 10 percent failures.	3	1	12M
Unit-II				
2	a Determine the dimension of cross-section of the connecting rod for a diesel engine with the following data: cylinder bore = 100 mm Length of connecting rod = 350 mm Maximum gas pressure = 4 MPa Factor of safety = 6	3	2	12M
	OR			
	b Discuss the design of piston for an internal combustion engine.	3	2	12M
Unit-III				
3	a Design a cast iron piston for a single acting four-stroke diesel engine with the following data: Cylinder bore = 300 mm Length of stroke = 450 mm Speed = 300 rpm Indicated mean effective pressure = 0.85 MPa Maximum gas pressure = 5 MPa Fuel consumption = 0.30 kg per BP per h Higher calorific value of fuel = 44 000 kJ/kg Assume suitable data if required and state the assumptions.	3	3	12M
	OR			
	b State the function of the following for an internal combustion engine piston: Ribs; Piston rings; Piston skirt; and Piston pin.	2	3	12M
Unit-IV				
4	a Derive an expression for radius of neutral axis for rectangular, circular, trapezoidal and C-clamps.	3	4	12M

	OR				
	b	A curved beam of rectangular section of 30 mm width and 40 mm depth and mean radius of curvature of 60 mm is initially unstressed. If a bending moment of 400 N-m is applied to the beam which tends to straighten it, determine the stresses at the inner and outer surface and sketch a diagram to show the variation of stresses across the section. Also find the position of Neutral axis.	3	4	12M
	Unit-V				
5	a	A belt drive consists of two V-belts in parallel, on grooved pulleys of the same size. The angle of the groove is 30° . the cross-sectional area of each belt is 750 mm^2 and $\mu = 0.12$. the density of the belt material is 1.2 Mg/m^3 and the maximum safe stress in the material is 7 MPa. Calculate the power that can be transmitted between pulleys of 300 mm diameter rotating at 1500 <i>r.p.m.</i> Find also the shaft speed in <i>r.p.m.</i> at which the power transmitted would be a maximum.	3	5	12M
	OR				
	b	A rope pulley with 10 ropes and a peripheral speed of 1500 m/min transmits 115kW. The angle of lap for each rope is 180° and the angle of groove is 45° . the coefficient of friction between the rope and pulley is 0.2. assuming the rope to be just on the point of slipping, find the tension in the tight and slack sides of the rope. The mass of each rope is 0.6 kg per meter length.	3	5	12M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M: Marks

III B.Tech II Semester Supple. Examinations, April-2023

Sub Code: 19BME6TH03

HEAT TRANSFER

Time: 3 hours

(ME)

Max. Marks: 60

Note: Answer All FIVE Questions.

All Questions Carry Equal Marks (5 X 12 = 60M)

Q.No	Questions	KL	CO	M	
1	Unit-I				
	a	i) Derive the generalized Fourier conduction equation in cylindrical coordinates.	K4	C01	6M
	a	ii) A brick wall 25 cm thick is faced with concrete of 5 cm thick. The thermal conductivity of the brick is 0.7 W/mK while that of the concrete is 0.9 W/mK. If the temperature of the exposed brick face is 30°C and that of the concrete is 5°C, find the heat loss per hour through a wall of 10 × 5m.	K5	C01	6M
	OR				
	b	i) Explain the different modes of heat transfer with neat sketches. Write down the basic laws of heat transfer ii) An exterior wall of a house may be approximated by a 200 mm layer of common brick (k = 0.7 W/mK) followed by 80 mm of gypsum plaster (k = 0.48 W/mK). What thickness of loosely packed rock-wool insulation (k = 0.065 W/mK) should be added to reduce the heat loss (or gain) through the wall by 70 percent.	K4 K5	C01 C01	6M 6M
2	Unit-II				
	a	Aluminum fins of rectangular profile are attached on a plane wall with 5 mm spacing. The fins have thickness 1 mm, length = 12 mm and the normal conductivity K = 250 W/mk. The wall is maintained at a temperature of 200°C and the fins dissipate heat by convection into ambient air at 35°C, with heat transfer coefficient = 50 W/m ² .k. Find the heat loss.	K5	C02	12M
	OR				
	b	i) Sketch various types of fin configurations ii) A longitudinal copper fin (k=3.5 W/m-K), 6 cm long and 5 mm in diameter is exposed to air stream at 20 °C. The connective heat transfer coefficient is 20 w/m ² -K. If the fin has the base temperature of 150°C, calculate the heat transfer by the fin and fin efficiency.	K4 K5	C02 C02	6M 6M
3	Unit-III				
	a	i) Derive the equation for thickness of hydrodynamic boundary layer and thermal boundary layers ii) Air at 30°C and at a pressure of 1 bar is flowing over a flat plate at a velocity of 4 m/s. if the plate is 280mm wide and at 56°C, calculate the following quantities at X=280mm. (a)Boundary layer thickness (b)Local friction coefficient (c) Average friction coefficient,(D) Shear stress due to friction, (e)Thickness thermal boundary layer(f) Local convective heat transfer coefficient	K4 K5	C03 C03	6M 6M
	OR				
	b	i) Derive the Empirical Relations for Convective Heat Transfer in Horizontal Pipe Flow. ii) A thin flat plate has been placed longitudinally in a steam of air at 20°C and while flows with undisturbed velocity of 7.5 m/s. The surface of plate	K4 K5	C03 C03	6M 6M

	is maintained at a uniform temperature of 120°C. (i). Calculate the heat transfer coefficient 0.8m from the leading edge of the plate, (ii). Also calculate the rate of heat transfer from one side of the plate to the air over the first 0.8 m length. Assume unit width of the plate			
	Unit - IV			
4	a i) Air at 18 °C and at a pressure of 2 atm is flowing along a flat plate at a velocity of 5.75 km/sec. If the plate is one meter wide and at 80 °C, find the quantities given below at x=2m. (i) Hydrodynamic Boundary layer thickness. (ii) Local friction factor (iii) Average friction (iv) Local heat transfer co-efficient (v) Rate of heat transfer	K5	C04	6M
	ii) In a shell and tube heat exchanger with 8 tube passes through a shell, hot engine oil available at 160°C flows through the shell and water through the tubes. Water at the rate of 2.5Kg/s is heated from 15°C to 85°C and there are ten tubes per pass. The diameter of each tube is 2.5 cm and the average convection coefficient $h_o=400\text{W/m}^2\text{K}$. Determine the flow rate of oil if its exit temperature is to be 100°C. Also compute the length of the tubes	K5	C04	6M
	OR			
	b i) Derive an expression for LMTD for parallel flow heat exchanger ii) A counter flow heat exchanger is to heat air entering at 400°C with a flow rate of 6 kg/s by the exhaust gas entering at 800°C with a flow rate of 4 kg/s. The overall heat transfer coefficient is 100 W/m ² K and the outlet temperature of air is 551.5°C. Specific heat at constant pressure for both air and exhaust gas can be taken as 1100 j/kg K. Calculate: i) Heat transfer area needed, ii) The number of transfer units.	K4	C04	6M
	Unit - V			
5	a i) Discuss the merits and demerits of film wise and drop wise condensation ii) A liquid is boiled at atmospheric pressure by a submerged horizontal tube, 32 mm OD. The normal boiling point of the liquid is 23.8°C. The tube wall is at 148.9°C. Calculate the heat transfer coefficient (h_o) and the heat flux (q/A): Data: - $\mu v = 0.013\text{Cp}$ $\lambda = 182\text{J / kg}$ $\text{Cp} = 0.607\text{ J/kg}^\circ\text{C}$ $\text{Kv} = 0.0109\text{ w/moC}$, $\rho v = 4.66\text{kg/m}^3$ $\rho L = 1452\text{Kg/m}^3$ $\sigma = 19\text{dyns / cm}$	K4	C05	6M
	b i) Two equal discs of diameter 200 mm each are arranged in two parallel planes 400 m apart. The temperature of the first disc is 500°C and that of the second disc is 300°C. Determine the radiating heat flux between them, if these are i. Black ii. Gray with emissivities 0.3 and 0.5 respectively.	K4	C05	6M
	ii) What are the factors that influence the radiant heat exchange between two bodies?	K4	C05	6M
	OR			

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M: Marks

III B.Tech II Semester Supple. Examinations, April-2023

Sub Code: 19BME6TH04

DYNAMICS OF MACHINERY

Time: 3 hours

(ME)

Max. Marks: 60

Note: Answer All FIVE Questions.

All Questions Carry Equal Marks (5 X 12 = 60M)

Q.No	Questions	KL	CO	M	
1	Unit-I				
	a	i) Derive the equation of gyroscopic couple $C = I\omega\omega_p$.	KL2	CO1	6M
		ii) The turbine rotor of a ship has mass of 2.2 tonnes and rotates at 1800 rpm in clockwise when viewed from the stern. The radius of gyration of rotor is 320mm. Determine the gyroscopic couple and its effect when the ship turns right at a radius of 250m with a speed of 25km/hr	KL3	CO1	6M
	OR				
	b	A disc with radius of gyration 60mm and a mass of 4kg is mounted centrally on a horizontal axle of 80mm length between the bearings. It spins about the axle at 800rpm counter-clockwise when viewed from the right hand side bearing. The axle precesses about a vertical axis at 50rpm in clockwise direction when viewed from above. Determine the resultant reaction at each bearing due to the mass and the gyroscopic effect.	KL3	CO1	12M
2	Unit-II				
	a	Explain single plate clutch with neat sketch.	KL2	CO2	4M
		A cone clutch with a semi-cone angle of 15° transmits 10kW at 600rpm. The normal pressure intensity between the surfaces in contact is not to exceed 100kN/m^2 . The Width of the friction surfaces is half of the mean diameter. Assume coefficient of friction as 0.25. Determine i) The outer and inner diameters of the plates ii) The axial force to engage the clutch.	KL3	CO2	8M
	OR				
	b	A band and block brake, having 14 blocks each of which subtends an angle of 15° at the centre, is applied to a drum of 1m effective diameter. The drum and flywheel mounted on the same shaft weigh 2000kg and a combined radius of gyration of 50cm. The two ends of the band are attached to pins on opposite sides of the brake lever at distance of 3cm and 12cm from the fulcrum. If a force of 20kg is applied at a distance of 75cm from the fulcrum, find i) Maximum braking torque ii) Angular retardation of the drum, and iii) Time taken by the system to come to rest from the rated speed of 360rpm.	KL3	CO2	12M
3	Unit-III				
	a	A Proell governor has equal arms of length 300mm. The upper and lower ends of the arms are pivoted on the axis of the governor. The extension arms of the lower links are each of 80 mm long and parallel to the axis, when the radius of rotation of the balls are 150 mm and 200 mm. The mass of each ball is 10 Kg and the mass of the central load is 100 Kg, determine the range of the speed of the governor	KL3	CO3	12M
	OR				
	b	A porter governor has four arms of 30cm long. The upper arm are pivoted at the axis of rotation and the lower arms are attached to the sleeve at a distance of 3.5cm from the axis. The mass of each ball is 54kg. Determine the equilibrium speed for the two extreme radii of 20cm and 25cm of rotation of the governor balls and the range of speed.	KL3	CO3	12M

		Unit-IV			
4	a	A shaft carries four masses A, B, C and D of magnitude 200 kg, 300 kg, 400 kg and 200 kg respectively and revolving at radii 80 mm, 70 mm, 60 mm and 80 mm in planes measured from A at 300 mm, 400 mm and 700 mm. The angles between the cranks measured anticlockwise are A to B 45°, B to C 70° and C to D 120°. The balancing masses are to be placed in planes X and Y. The distance between the planes A and X is 100 mm, between X and Y is 400 mm and between Y and D is 200 mm. If the balancing masses revolve at a radius of 100 mm, find their magnitudes and angular positions.	KL3	CO4	12M
	OR				
	b	Data of three unbalanced masses A, B and C are given below. $M_a=4\text{kg}$, $M_b=3\text{kg}$, $M_c=2.5\text{kg}$, $R_a=75\text{mm}$, $R_b=85\text{mm}$, $R_c=50\text{mm}$, $\theta_a=45^\circ$, $\theta_b=135^\circ$, $\theta_c=240^\circ$. The shaft length is 800mm between bearings. These three masses are completely balanced by two counter masses located 75mm from each bearing. The axial distance of 3 unbalanced masses are $L_a=150\text{mm}$, $L_b=350\text{mm}$, and $L_c=525\text{mm}$, from the right hand side of counter mass plane. Determine the masses and angular positions of counter masses, if the radial location of counter masses are $R_{b1}=75\text{mm}$ and $R_{b2}=40\text{mm}$	KL3	CO4	12M
		Unit-V			
5	a	An inside cylinder locomotive has its cylinder centre lines 0.7 m apart and has a stroke of 0.6 m. The rotating masses per cylinder are equivalent to 150 kg at the crank pin, and the reciprocating masses per cylinder to 180 kg. The wheel centre lines are 1.5 m apart. The cranks are at right angles. The whole of the rotating and 2/3 of the reciprocating masses are to be balanced by masses placed at a radius of 0.6 m. Find the magnitude and direction of the balancing masses. Find the fluctuation in rail pressure under one wheel, variation of Tractive effort and the magnitude of swaying couple at a crank speed of 300 r.p.m	KL3	CO5	12M
	OR				
	b	A Twin cylinder engine has its crank at 90° apart the masses of reciprocating parts is 300kg, crank radius 0.3m. Driving wheel diameter 1.8m, the distance between the cylinder centre line is 0.65m. Determine: i) The fraction of reciprocating masses to be balanced, if the hammer blow is not to be exceeded 40kN at 100 kmph. ii) Variation in tractive effort iii) Swaying couple.	KL3	CO5	12M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M: Marks

III B.Tech II Semester Supple. Examinations, April-2023

Sub Code: 19BEC6TH02

DIGITAL SIGNAL PROCESSING

Time: 3 hours

(ECE)

Max. Marks: 60

Note: Answer All FIVE Questions.

All Questions Carry Equal Marks (5 X 12 = 60M)

Q.No	Questions	KL	CO	M
Unit-I				
1	i) Determine whether the following discrete time signal is periodic. If the signal is periodic determine its fundamental period. i) $x(n) = \sin\left(\frac{\pi}{4}n\right)\sin\left(\frac{\pi}{3}n\right)$ ii) $x(n) = e^{j(\pi/12)n} + e^{-j(\pi/12)n}$	3	1	6M
	ii) Test whether the system is linear ; $y[n] = Ax[n] + B$	3	1	6M
	OR			
	i) Classify the following system in terms of linearity, causality and stability. $y(n) = x(n) + 1/x[n+1]$	4	1	6M
	ii) Illustrate the properties of DTFT.	2	1	6M
Unit-II				
2	a) Compute the 8-point DFT of the sequence $x(n) = \{1,2,3,4,4,3,2,1\}$ using DIF-FFT algorithm.	3	2	12M
	OR			
	i) Determine the output $y(n)$ if $h(n) = \{1,1,1,1\}$; $x(n) = \{1,2,3,1\}$ by Linear convolution using DFT. ii) System function of a discrete LSI system is given as $H(z) = \frac{3z^2 - 4z}{z^2 - 3.5z + 1.5}$ Specify the ROC of $H(z)$ and determine $h(n)$ for the system to be stable	3	2	6M
		4	2	6M
Unit-III				
3	a) Obtain the direct form I and II and cascade form for the given system function; $y(n) = -0.1 y(n-1) + 0.2 y(n-2) + 3 x(n) + 6.6 x(n-1) + 0.6 x(n-2)$	3	3	12M
	OR			
	i) With suitable examples, describe the realization of linear phase FIR filters.	2	3	6M
	ii) Realize the following FIR filter with transfer function $H(z) = 1 + 3/4 z^{-1} + 17/8 z^{-2} + 3/4 z^{-3} + z^{-4}$; with Linear phase FIR structure	3	3	6M

Unit-IV					
4	a	i) For the constraints $0.8 \leq H(e^{j\omega}) \leq 1$, $0 \leq \omega \leq 0.2\pi$ $ H(e^{j\omega}) \leq 0.2$, $0.6\pi \leq \omega \leq \pi$ with $T=1$ sec. Determine system function $H(z)$ for a Butterworth filter using Bilinear transformation.	3	4	6M
		ii) Draw the structure for IIR filter in direct form-I and II for the transfer Function, $H(z) = (2 + 3z^{-1})(4 + 2z^{-1} + 3z^{-2}) / (1 + 0.6z^{-1})(1 + z^{-1} + 0.5z^{-2})$.	3	4	6M
	OR				
	b	i) Explain the steps involved in the design of IIR filter.	2	4	6M
ii) Design a digital Chebyshev filter to satisfy the constraints $0.707 \leq H(e^{j\omega}) \leq 1$, $0 \leq \omega \leq 2\pi$ $ H(e^{j\omega}) \leq 0.1$, $0.5\pi \leq \omega \leq \pi$ Using Bilinear Transformation and assuming $T=1$ sec.		3	4	6M	
Unit-V					
5	a	i) Using Rectangular window technique design a LPF with pass band gain of unity, cut-off frequency of 1000Hz and working sampling frequency of 5 KHZ. The length of impulse is 7.	3	5	6M
		ii) Analyse the design of FIR filters using windows and write the expressions for Hamming and Hanning window.	4	5	6M
	OR				
	b	i) Design a LPF using a Hamming window with $N=7$ for the following. $H_d(\omega) = e^{-j3\omega} \quad -3\pi/4 \leq \omega \leq 3\pi/4$ $= 0 \quad 3\pi/4 \leq \omega \leq \pi$	3	5	6M
ii) Compare and contrast IIR and FIR filters.		4	5	6M	

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M: Marks

III B.Tech II Semester Supple. Examinations, April-2023

Sub Code: 19BEC6TH03 MICRO CONTROLLERS AND EMBEDDED SYSTEMS

Time: 3 hours

(ECE)

Max. Marks: 60

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks (5 X 12 = 60M)

Q.No	Questions	KL	CO	M	
1	Unit-I				
	a	i) With a neat figure explain the architecture of 8051 microcontroller	2	1	6M
		ii) Explain PUSH and POP instructions with suitable examples	2	1	6M
	OR				
	b	i) Write the various addressing modes in 8051 microcontroller with examples		1	6M
		ii) Discuss about data and bit manipulation instructions in 8051 microcontroller	2	1	6M
2	Unit-II				
	a	i) Explain how data exchange operation takes place in 8051 micro controller	2	2	12M
		ii) Write a program to generate a square wave of 2KHz frequency on pin 1.5 of 8051			
	OR				
b	i) Draw and develop the source program to interface ADC with 8051 microcontroller	2	2	6M	
	ii) Write a program to subtract 115F83H from 21449BH. Save the result in RAM location starting at 10H	2	2	6M	
3	Unit-III				
	a	i) Discuss the organization structure of ARM processor	2	3	6M
		ii) Explain the important features of ARM processors	2	3	6M
	OR				
b	i) Elaborate the features and specifications of ARM processor	2	3	6M	
	ii) Explain ARM Thumb programming model	2	3	6M	
4	Unit-IV				
	a	i) Explain about embedded system design flow	2	4	6M
		ii) Discuss the important characteristics and quality attributes of embedded Systems	2	4	6M
	OR				
b	i) Explain different types of memories used in embedded system	2	4	6M	
	ii) List the factors to be considered for selection of microcontroller for designing Chocolate vending machine application	2	4	6M	
5	Unit-V				
	a	i) Briefly explain the procedure of super loop approach for embedded firmware design	2	5	6M
		ii) Defend the need for brown-out detection circuit in real time embedded applications and explain the mechanism for implementing the same	2	5	6M
	OR				
	Develop an intruder alarm system as an embedded system	3	5	12M	

III B.Tech II Semester Supple. Examinations, April-2023

Sub Code: 19BEC6TH04 OBJECT ORIENTED PROGRAMMING THROUGH JAVA

Time: 3 hours

(ECE)

Max. Marks: 60

Note: Answer All FIVE Questions.

All Questions Carry Equal Marks (5 X 12 = 60M)

Q.No	Questions	KL	CO	M
Unit-I				
1	a	i) Explain any five object-oriented features supported by java with examples.		
		KL2	CO1	6M
	ii) Describe the Java environment.			6M
	OR			
b	i) Explain the structure of Java program.			6M
	KL2	CO1	6M	
ii) Explain the features supported by java.			6M	
OR				
Unit-II				
2	a	i) Explain the scope of variable.		
		KL2	CO2	6M
	b	ii) List out the decision-making statements available in Java. Explain with example		
		KL1	CO2	6M
OR				
b	i) Explain type casting with example.			6M
	KL2	CO2	6M	
ii) List out the looping statements available in Java. Explain with example.			6M	
OR				
Unit-III				
3	a	i) Explain in detail how exception handling mechanism used in Java using 'throw' and 'throws'.		
		KL3	CO3	6M
	b	ii) What is an Exception? List out the keywords for exception handing and write steps to develop user defined exception.		
		KL4	CO3	6M
OR				
b	i) Explain how inheritance is implemented in Java. What is the use of 'super' keyword? Illustrate its usage with suitable examples.			6M
	KL3	CO3	6M	
ii) Write a Java program to calculate the area of different shapes namely circle, rectangle, and triangle using the concept of method overloading.			6M	
OR				
Unit-IV				
4	a	i) What is multithreading? Explain how multithreading in single processor system is different from multithreading in multiprocessor system.		
		KL2	CO4	6M
	ii) Explain different methods of Thread class			6M
	KL4	CO4	6M	
OR				
b	i) Explain the different ways of creating a thread.			6M
	KL2	CO4	6M	
ii) Explain File Reader and File Writer classes with example programs.			6M	
OR				
Unit-V				
5	a	i) Define Applet. Draw the life cycle of Applet in Java showing the different methods invoked.		
		KL3	CO5	6M
	ii) Explain different Layout managers			6M
	KL4	CO5	6M	
OR				
b	i) Write a JAVA program that displays the x and y position of the cursor movement using Mouse			6M
	KL3	CO5	6M	
ii) Write an AWT program to create a Calculator with basic arithmetic operations			6M	
OR				
ii) Write an AWT program to create a Calculator with basic arithmetic operations			6M	
OR				

KL: Blooms Taxonomy Knowledge Level

CO: Course Outcome

M: Marks***

III B.Tech II Semester Supple. Examinations, April-2023

Sub Code: 19BCS6TH02 ARTIFICIAL INTELLIGENCE

Time: 3 hours

(CSE)

Max. Marks: 60

Note: Answer All **FIVE** Questions.
 All Questions Carry Equal Marks (5 X 12 = 60M)

Q.No	Questions	KL	CO	M	
Unit-I					
1	a	i) Describe the numerous Characteristics of Problem.	1	1	6M
		ii) Define Tower of Hanoi Problem. Explain the stepwise procedure for solving this problem using AI Algorithm.	2	1	6M
	OR				
	b	i) Describe the numerous Characteristics of Production System.	1	1	6M
	ii) What is Breadth First Search (BFS)? Explain the stepwise procedure for BFS using AI Algorithm. List its advantages and disadvantages.	2	1	6M	
Unit-II					
2	a	Suppose that we are attempting to resolve the following clauses: 1. Loves (father(a) , a) 2. \neg Loves(y, x) \vee Loves(x,y) What will be the result of the unification algorithm when applied to clause (i) and the first term of clause (ii)?	3	2	12M
	OR				
		ii) Trace the operation of the unification algorithm on each of the following pairs of literals: 1. f(Marcus) and f(Caesar) 2. f(x) and f(g(y)) 3. f(Marcus, g(x, y)) and f(x, g(Caesar, Marcus)).	3	2	12M
	Unit-III				
3	a	i) Explain the numerous Knowledge Acquisition Techniques.	2	3	6M
		ii) What are Semantic nets? Write different applications of it.	2	3	6M
	OR				
	b	i) Describe the numerous Types of Knowledge Representation.	2	3	6M
	ii) What is Conceptual dependency? Describe its characteristics.	2	3	6M	
Unit-IV					
4	a	i) Explain the process of inductive learning using decision trees.	2	4	6M
		ii) Explain the applications of Q-learning algorithms.	2	4	6M
	OR				
	b	i) Differentiate between the various learning methods: neural networks, reinforcement learning and genetic algorithms.	3	4	6M
	ii) Describe the roles of learning in problem solving with example.	2	4	6M	
Unit-V					
5	a	i) What are the requirements of Parallelism in Reasoning systems. Explain with one example.	2	5	6M
		ii) Explain the characteristics of Discourse and Pragmatic Processing.	1	5	6M
	OR				
	b	i) Use one Realtime example spell checking application using AI.	1	5	6M
	ii) What are the applications of Distributed reasoning systems. Use one Realtime example to explain your answer.	2	5	6M	

III B.Tech II Semester Supple. Examinations, April-2023

Sub Code: 19BCS6TH03 CRYPTOGRAPHY AND NETWORK SECURITY

Time: 3 hours

(CSE)

Max. Marks: 60

Note: Answer All FIVE Questions.
All Questions Carry Equal Marks (5 X 12 = 60M)

Q.No	Questions	KL	CO	M	
1	Unit-I				
	a	i) Define attack. Explain different types security attacks in detail.	K2	1	6M
		ii) Draw and explain symmetric cipher model in detail.	K2	1	6M
	OR				
b	Explain the following with an example i) Play Fair ii) Hill Cipher iii) Rail fence	K4	2	12M	
2	Unit-II				
	a	Draw and explain the round structure, IP, IP inverse, S-box structure of DES in detail.	K3	3	12M
	OR				
b	Explain various block cipher modes of operations.	K3	3	12M	
3	Unit-III				
	a	Explain Fermat and Euler theorem with an example.	K2	3	12M
	OR				
b	i) Explain public key crypto system with an example ii) Explain diffie hellman key exchange algorithm with an example.	K3	3	6M	
4	Unit-IV				
	a	i) Explain PGP in detail.	K2	4	6M
		ii) Explain SHA-512 in detail.	K2	4	6M
	OR				
b	i) Explain DSS in detail.	K2	4	6M	
	ii) Explain one way authentication in detail.	K2	4	6M	
5	Unit-V				
	a	i) Explain X.509 authentication service in detail.	K2	6	6M
		ii) Explain about E-Mail in detail.	K2	6	6M
	OR				
b	i) Define Firewall. Explain various types of firewalls.	K2	6	6M	
	ii) Explain about SSL record protocol.	K2	6	6M	

III B.Tech II Semester Supple. Examinations, April-2023

Sub Code: 19BCI6PE04

BIG DATA ANALYTICS

Time: 3 hours

(CSE&IT)

Max. Marks: 60

Note: Answer All FIVE Questions.

All Questions Carry Equal Marks (5 X 12 = 60M)

Q.No	Questions	KL	CO	M			
Unit-I							
1	a	i) Explain about the architecture of GFS.			2	1	6M
		ii) Build a distributed file system by installing Hadoop in Local (standalone) mode and explain with an example.			2	1	6M
	OR						
	b	i) Build a distributed file system by installing Hadoop in Fully Distributed Mode and explain with an example			2	1	6M
ii) Illustrate in detail of basic building blocks of Hadoop.			1	1	6M		
Unit-II							
2	a	Explain Java MapReduce. Write a program to implement the concept of Hadoop MapReduce.			4	2	12M
	OR						
	b	i) Distinguish between classical map reduce framework and YARN map reduce framework			2	2	6M
		ii) Analyze map reduce on weather data set.			3	2	6M
Unit-III							
3	a	i) Examine RDD transformations with example .			2	3	6M
		ii) Analyze the concept of RDD and state how we can create RDDs in Apache Spark.			3	3	6M
	OR						
	b	i) What Is Apache Spark ? Explain RDD Operations .			2	3	6M
ii) Explain about persistence with an example			2	3	6M		
Unit-IV							
4	a	i) Explain the evaluation procedure of Local and Distributed Modes of Running Pig Scripts .			2	4	6M
		ii) Sketch the Pig Architecture with explanation			3	4	6M
	OR						
	b	i) Analyze Pig Latin Script.			2	4	6M
ii) List and categorize the operators supported by pig.			2	4	6M		
Unit-V							
5	a	i) Sketch the architecture of HIVE with explanation.			2	5	6M
		ii) Explain the procedure of Creating and Managing Databases and Tables .			4	5	6M
	OR						
	b	i) Explain the key HiveQL features.			2	5	6M
ii) How to Apply Structure to Hadoop Data with Hive? Explain .			3	5	6M		

KL: Blooms Taxonomy Knowledge Level

CO: Course Outcome

M: Marks
