NARASARAOPETA ENGINEERING COLLEGE
NEC
(AUTONOMOUS)

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

Sub Code: 19BCC5TH01   ENTREPRENEURSHIP AND INNOVATION

Time: 3 hours

(Common to CE, ME, 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) Define Entrepreneurship? List out the characteristics of entrepreneur	K1	1	6M
			ii) Elucidate the role of entrepreneurship in economic development	K2	1	6M
			OR			
	b		i) Explain define types of Entrepreneurs with suitable examples	K2	1	6M
			ii) Outline the role of NIESBUD to startup entrepreneurs	K1	1	6M
			Unit-II			
2	a		Define the term 'Creativity'. Explain the process of Creativity	K1	2	12 M
			OR			
	b		i) "All innovations are not commercially successful". Analyze the statement	K4	2	6M
			ii) Define the term 'Innovation'. Distinguish between Creativity and Innovation with suitable illustrations.	K2	2	6M
			Unit-III			
3	a		"Entrepreneurs are made or born". Elucidate your opinion with cases in history	K3	3	12 M
			OR			
	b		How does Entrepreneurship Development Programme help the Startup Entrepreneurs in achieving their goals	K3	3	12 M
			Unit-IV			
4	a		i) Write note on 'Sources of New Ideas'.	K1	4	6M
			ii) Explain SCAMPER Technique with Suitable examples	K1	4	6M
			OR			
	b		i) What do you mean by Project Feasibility Study	K2	4	4M
			ii) Explain how do you evaluate a project using any one of these techniques (PBP, NPV, IRR).	K1	4	8M
			Unit-V			
5	a		i) Define and distinguish between Micro & Small Enterprises	K1	5	4M
			ii) Analyze the features of MSME's Development Act 2006	K4	5	8M
			OR			
	b		i) Critically analyze the Factors inducing growth in MSME's	K4	5	6M
			ii) Chalk out a plan to address the sickness in small businesses.	K5	5	6M

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

Sub Code: 19BCS5TH05   ADVANCED JAVA AND WEB TECHNOLOGIES

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) Differentiate Http servlet and Generic servlet	2	1	6M
			ii) Explain the Lifecycle of a Servlet	2	1	6M
			OR			
	b		i) Describe Session Tracking process	2	1	6M
			ii) List out the steps for installing tomcat web server	2	1	6M
			Unit-II			
2	a		Explain the anatomy of a JSP page and discuss about JSP processing.	2	2	12M
			OR			
	b		i) List out the action elements in JSP	2	2	6M
			ii) Compare and contrast Java servlets and JSP.	2	2	6M
			Unit-III			
3	a		i) What are implicit objects in JSP and Explain?	2	3	6M
			ii) List the differences between include directive and include action tag.	2	3	6M
			OR			
	b		i) Explain Scriplets used in Java Server Pages.	3	3	6M
			ii) List the difference between ServletContext and PageContext.	3	3	6M
			Unit-IV			
4	a		i) Explain the application of data access object pattern with suitable example.	3	4	6M
			ii) What is the Use of Prepared Statement	3	4	6M
			OR			
	b		i) Brief explain Javax.sql.* package.	3	4	6M
			ii) Explain Database Programming using JDBC.	2	4	6M
			Unit-V			
5	a		i) How can PHP and Javascript interact?	3	5	6M
			ii) What are the steps to create a new database using MySQL and PHP?	2	5	6M
			OR			
	b		i) Name some of the constants in PHP and their purpose.	2	5	6M
			ii) What are the two most common ways to start and finish a PHP block of code?	2	5	6M

NEC NAKASAKAUPETA ENGINEERING COLLEGE
(AUTONOMOUS)

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

Sub Code: 19BCC5OE01   **DISASTER 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		i) Explain the various hazards affecting the environment.	2	1	6M
			ii) Explain clearly about landscape approach and perception approach of disaster management.	2	1	6M
			OR			
	b		i) Explain different types of meteorological disaster.	2	1	6M
			ii) Discuss various types of natural disasters in India and highlight their effects.	2	1	6M
			Unit-II			
2	a		i) Write about transport hazard dynamics.	2	2	12M
			ii) explain the manmade disaster and their management in detailed.	2	2	
			OR			
	b		i) What are the different approach for disasters with human ecology?	2	2	6M
			ii) write about disaster management cycle.	2	2	6M
			Unit-III			
3	a		i) Discuss the stages in disaster risk reduction	2	2,3	6M
			ii) Write in detail about earthquake vulnerability assessment and building and infrastructure?	2	3	6M
			OR			
	b		i) Write a case study on disaster risk reduction in India.	2	3	6M
			ii) Critically examine the various factors affecting vulnerability in disaster management.	2	2,3	6M
			Unit-IV			
4	a		i) Infer how the available technology can play a large role in disasters	2	3,4	6M
			ii) explain about roads and bridges mitigation program for an earthquake.	2	3,4	6M
			OR			
	b		i)how multimedia technology helps in disaster risk management.	2	3,4	6M
			ii) write about the different categories of indigenous knowledge disaster reduction.	2	3,4	6M
			Unit-V			
5	a		i) Explain on the public awareness and public education for disaster risk reduction	2	4	6M
			ii) Write about the essentials of school disaster education.	2	4	6M
			OR			
	b		i) Explain community capacity and disaster resilience.	2	1,3	6M
			ii) Write about community based disaster management and social capital.	2	1,3	6M

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

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

Sub Code: 19BCC5OE08   **CONSUMER ELECTRONICS**

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) Describe the working principle of Microphone with neat diagram.	2	1	6M
			ii) Explain about different types of headphones.	2	1	6M
			OR			
	b		i) Differentiate Crystal Loud speakers and Electro-dynamic loud speakers.	4	1	6M
			ii) Discuss in detail about acoustic labyrinth systems.	2	1	6M
			Unit-II			
2	a		i) Analyze the block diagram of Hi-Fi amplifier with neat sketches.	4	2	6M
			ii) Describe why equalising pulses are needed. Draw the vertical synchronizing pulse structure.	4	2	6M
			OR			
	b		i) "Digital camcorders are best for video recording than digital camera". Justify.	4	2	6M
			ii) Explain the block diagram and operation of public address system.	2	2	6M
			Unit-III			
3	a		i)Explain basic elements of monochrome TV communication system.	2	3	6M
			ii) State any four CCIR-B standard for colour signal transmission and four CCIRB standards for reception in TV.	2	3	6M
			OR			
	b		i) Define following with respect to television : (a) Aspect Ratio (b) Vertical & Horizontal Resolution (c) Interlace scanning (d) Image continuity	2	3	6M
			ii) Analyze the working principle of Digital Cameras.	4	3	6M
			Unit-IV			
4	a		i) Draw and describe DTH System.	2	4	6M
			ii) Describe Troubleshooting procedure of colour TV receiver system.	4	4	6M
			OR			
	b		i) Write the specification of HDTV.	2	4	6M
			ii) Differentiate between LCD and LED T.V.	4	4	6M
			Unit-V			
5	a		i) Draw and explain the block diagram of washing machine. State advantages of automatic washing machine.	2	5	6M
			ii) Outline the working principle of Facsimile machine.	2	5	6M
			OR			
	b		i) Explain the working of microwave oven and give its four electrical specifications.	2	5	6M
			ii)Elaborate the working principle of photo copier machine .	2	5	6M

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

Sub Code: 19BCC5OE10
Time: 3 hours

OOPS THROUGH JAVA
(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	i) "JAVA is one of the best OOP language in the World". Justify this statement.	2	1	6M
		ii) Interpret the need of JVM in JAVA to achieve platform independence.	2	1	6M
		OR			
	b	i) Interpret and summarize the features of JAVA.	2	1	6M
		ii) Compare Procedure language with OOP. List any two programming languages in each case.	2	1	6M
		Unit-II			
2	a	i) Illustrate type conversion and casting in JAVA with simple example.	3	2	6M
		ii) With a simple example, illustrate constructor overloading.	2	2	6M
		OR			
	b	i) Illustrate the use of static keyword in JAVA with example.	3	2	6M
		ii) Infer the use of command line argument with simple example.	4	2	6M
		Unit-III			
3	a	i) Illustrate the concept of method overriding in JAVA with an example program.	3	3	6M
		ii) Which one is super class for all classes in JAVA? Explain its methods briefly.	2	3	6M
		OR			
	b	i) Illustrate how multiple inheritance is achieved in JAVA with example.	3	3	6M
		ii) Discuss the use of super keyword with an example program.	2	3	6M
		Unit-IV			
4	a	i) Report basic constructs used to handle exceptions in JAVA with simple example.	2	3	6M
		ii) Illustrate any two AWT components in JAVA with example program.	3	4	6M
		OR			
	b	i) Describe the uses of layout managers and explain any one with example.	2	4	6M
		ii) Explain the procedure of creating customized exception in JAVA.	2	3	6M
		Unit-V			
5	a	Explain event delegation model in JAVA. And illustrate handling of mouse events with an example program.	2	4	12M
		OR			
	b	Interpret different types of event listener interfaces in JAVA. Write the use of Adapter classes. Also explain handling of "Key Pressed" event with adapter class.	2	4	12M

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

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

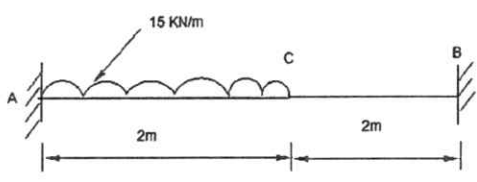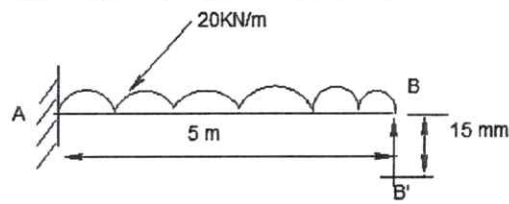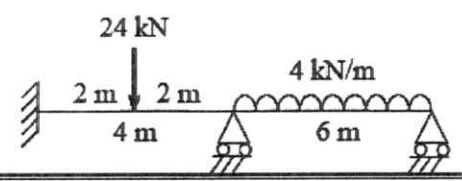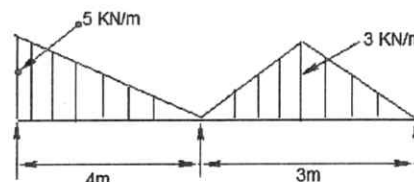**Sub Code: 19BCE5TH02** **STRUCTURAL ANALYSIS-II**

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			
	a		i) Explain the Method of Superposition by considering a propped cantilever beam.	K3	1	6M
			ii) The fixed beam with partial UDL is shown in Figure. Adopt the consistent deformation method and determine the fixed-end moments and reactions. 	K4	1	6M
1			OR			
	b		i) Discuss the importance of Propped Cantilever beam and calculate the deflection profile, and slope with a suitable example.	K3	1	6M
			ii) In the beam shown in Figure, the prop has sunk by 15 mm. Calculate the prop reaction Take $E=200 \times 10^6$ KN/m^2 and $I=5 \times 10^6$ m^4 	K4	1	6M
			Unit-II			
	a		Analyze the continuous beam shown in the figure by Clapeyron's theorem of three moments. Draw BMD and SFD. 	K4	2	12M
2			OR			
	b		i) Derive the Clapeyron's equation of three moments.	K3	2	6M
			ii) Using Clapeyron's theorem, solve the problem of the continuous beam as shown in Figure. EI is constant throughout. 	K4	2	6M
			Unit-III			
3	a		i) A beam ABC, 10m long, fixed at ends A and B is continuous over joint B and is loaded as shown in Fig. Using the slope deflection method, compute the end moments and plot the bending moment diagram. Also, sketch the deflected shape of the beam. The beam has constant EI for both spans. All dimentions are in	K4	3	6M

		meter			
		5 kN 8 kN A B C 3 — 2 — 2.5 — 2.5 EI constant			
		ii) Explain the analysis of continuous beams with and without settlement of supports using the moment distribution method with a suitable example.	K4	3	6M
		OR			
		i) A continuous beam ABC covers two consecutive spans AB and BC of lengths 6 m and 8 m, carrying loads of 10 kN/m and 15 kN/m respectively. If the ends A and B are simply supported, find the support reactions at A, B and C. Use the slope deflection method. Draw the shear force and bending moment diagram.	K4	3	6M
	b	ii) Analyse the continuous beam shown in the figure by using the moment distribution method. Draw SFD and BMD. 24 kN 8 kN/m A B C 1.5 m 1.5 m 3.0 m	K4	3	6M
		Unit-IV			
4	a	i) Explain how the settlement of supports is accounted into Kani's method of analysis of structures.	K3	4	6M
		ii) Determine the moments at support if support B yields by 10 mm under the given loading for the beam as shown in the figure below by Kani's method, $E=2.05 \times 10^5\,N/mm^2$, $I=30 \times 10\,mm^4$ 40 kN/m 50 kN 4 m 3 m 1 m	K4	4	6M
		OR			
	b	i) Evaluate the bending moment and shear force diagrams of a beam in the figure by the Kani's method 25 KN/m 50 KN 1 m 6 m 6 m	K4	4	6M
		ii) Explain how portal frames with side sways are analysed.	K3	4	6M
		Unit-V			
5	a	i) Explain the concept of the Stiffness Method for One-Dimensional Truss Elements	K3	5	6M
		ii) Explain the full process for a matrix structural analysis for a one-dimensional truss using the simple example	K4	5	6M
		OR			
	b	i) Determine the nodal loads required for analyzing the continuous beam. 8 kN 24 kN/m 2 kNm 1 m 0.5 m 0.5 m	K4	5	12M

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

Sub Code: 19BCE5TH03   DESIGN OF REINFORCED CONCRETE STRUCTURES

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	i) Differentiate between under-reinforced and over-reinforced sections with stress distribution diagram.	K2	1	6M
		ii) When a doubly reinforced rectangular beam is preferred instead of singly reinforced rectangular beam? Justify your answer with stress distribution diagram.	K3	1	6M
		OR			
	b	A reinforced concrete beam having a rectangular section 300 mm wide is reinforced with 3 bars of 12 mm diameter at an effective depth of 550 mm. The section is subjected to a service load moment of 40 kN-m. Assuming M20 grade concrete and Fe415steel are used. Estimate the stresses in concrete and steel.	K4	2	12M
		Unit-II			
2	a	A reinforced concrete beam is to be designed over an effective span of 5m to support a design load of 8kN/m. Adopt M20 grade of concrete and Fe415 steel bars and design the beam the satisfy the collapse and serviceability limit states.	K4	2	12M
		OR			
	b	i) How the Limit state method is differ from the Working stress method? List out the assumptions of Limit state method.	K2	1	6M
		ii) A rectangular RC Beam has a width of 230mm and is reinforced with 3 bars of 16mm diameter at an effective depth of 400mm. If M20 grade concrete and fe415 steel are used, estimate the ultimate moment of resistance of the section.	K5	2	6M
		Unit-III			
3	a	i) A reinforced concrete beam has a support section width of 230mm and effective depth of 500mm. The support section is reinforced with 3 bars of 20mm diameter on the tension side. The two legged stirrups with 8mm diameter are provided at a spacing of 200 centres. Using M20 grade concrete and Fe415 steel bars, calculate the shear strength of the support section.	E5	2	12M
		OR			
	b	i) A simply supported beam of rectangular section spanning over 6m has a width of 300mm and overall depth of 600mm. The beam is reinforced with 4 bars of 25mm diameter on the tension side at an effective depth of 550mm. The beam is subjected to a working load moment of 160kN-m at the centre of the span. Using M25 grade concrete and Fe415 steel bars, check the beam for the serviceability limit state of cracking according to IS:456-2000 code method.	E5	2	12M
		Unit-IV			
4	a	i) A rectangular reinforced concrete column of cross sectional dimensions of 300mm x 600mm is to be designed to support an ultimate axial load of 2000kN. Design suitable reinforcements in the column using M20 grade concrete and Fe415 steel bars.	E4	3	6M

			KL	CO	M
		OR			
	b	i) Design a reinforced concrete footing for a rectangular column of section 300mm x 500mm supporting an axial factored load of 1500kN. The safe bearing capacity of the soil at site is 185kN/m². Adopt M20 grade concrete and Fe415 steel bars.	E4	3	12M
		Unit-V			
5	a	i) Design a one-way slab with a clear span of 3.5m, simple supported on 230mm thick masonry wall to support a live load of 4kN/m². Use M20 grade concrete and Fe415 steel bars. Sketch a neat reinforcement detaining.	E4	4	12M
		OR			
	b	i) Design a chajja projecting 1.2m from the support using M25 grade concrete and Fe4215 steel bars. The live load over the slab is 3kN/m². Sketch a neat reinforcement detaining.	E4	4	6M

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

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

Sub Code: 19BCE5TH04

Time: 3 hours

SOIL MECHANICS

(CE)

Max. Marks: 60

Q.No		Questions	KL	CO	M
		Unit-I			
1	a	i) What is the use of classification of soils? Discuss Indian Standard classification system	2	1	6M
		ii) Describe the process of soil formation.	2	1	6M
		OR			
	b	i) Establish the relationship between degree of saturation, moisture content, specific gravity of soil particles and void ratio.	2	1	6M
		ii) Write notes on texture and structure of soils.	2	1	6M
		Unit-II			
2	a	A soil sample 90 mm high and 6000 mm2 in cross-section was subjected to a falling head permeability test. The head fall from 500 mm to 300 mm in 1500 sec. The permeability of the soil was $2.4\times10{-}3$ mm/s. Determine the diameter of the stand pipe.	3	2	12M
		OR			
	b	i) Derive an expression for determining permeability of soil by falling head permeameter.	2	2	12M
		Unit-III			
3	a	Explain the difference between Boussinesq's and methods of calculating stresses in a soil mass due to an external loading. Discuss which method you would prefer and why?	2	2	12M
		OR			
	b	i) What are the basic assumptions in Boussinesq's theory of stress distribution in soils? Also describe the concept of pressure bulb and its use.	2	3	6M
		ii) A line load of 90 kN/m run extends to a long distance. Determine the intensity of vertical stress at a point 1.5m below the surface: (i) Directly under the line load, and (ii) At a distance 1m perpendicular to the line load. Use Boussinesq's theory	3	3	6M
		Unit-IV			
4	a	i) What are the factors that affect the compaction of soil in the field?	2	4	6M
		ii) How will you measure the compaction in the field? Describe a method with its limitation	2	4	6M
		OR			
	b	i) Differentiate between consolidation and compaction.	2	4	6M
		ii) What is the time factor? How it is related to the average degree of consolidation?	2	4	6M
		Unit-V			
5	a	i) What is mohrs circle? Discuss its importance characteristics	2	5	6M
		ii) Explain the factors affecting shear characteristics of sand and clays.	2	5	6M
		OR			
	b	i) What is Mohr's strength theory for soils. Sketch typical strength envelopes for a clean sand?	2	5	6M
		ii) What are the advantages of triaxial shear test over the direct shear test?	2	5	6M

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III B.Tech I Semester Supple. Examinations, Month/Year

Sub Code: 19BCE5TH05   **CONCRETE 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
		Unit-I			
1	a	i) Write about Hydration of cement? Explain in detailed.	1	1	6M
		ii) What are the different physical tests of cement?	1	1	6M
		OR			
	b	i) How are the strength tests of cement performed?	1	2	6M
		ii) What are the major compounds in Portland cement?	2	2	6M
		Unit-II			
2	a	What are the properties of good aggregates for making concrete and discuss in brief various tests carried out on aggregates.	1	1,2	12M
		OR			
	b	i) What is sieve analysis of fine aggregate? Write about gap graded and well graded aggregate.	2	1,2	6M
		ii) Write about bulking of aggregate and soundness of aggregate.	2	1	6M
		Unit-III			
3	a	i) What are the different types of admixture? Write about flyash and silica fume.	1	1	6M
		ii) What are the retarders and accelerators? Explain in detailed.	1	1	6M
		OR			
	b	i) What is segregation and bleeding of concrete why they occur, discuss how to prevent them	2	2	6M
		ii) What are the properties of fresh concrete? What are the different tests of workability?	1	2	6M
		Unit-IV			
4	a	Design M25 grade concrete mix using IS method for mild exposure and good quality control. The workability required is 0.9 CF. Maximum size of coarse aggregate is 20mm and fine aggregate confirmed to Zone.III. The specific gravity of cement is 3.05, specific gravity of coarse aggregate and fine aggregate is 2.77. Cement is OPC 53 grade. Water absorption by CA is 1.5% and moisture content in FA is 3%. Assume any other suitable data if necessary.	3,4	3	12M
		OR			
	b	i) Discuss about the maturity concept of concrete, ii. The strength of sample of fully matured concrete is found to be 40Mpa. Find the strength of identical concrete at the age of 7 days when cured at an average temperature during day time at 20^0C and night time at 10^0C.	4	4	6M
		ii) Discuss about the rebound hammer test method on concrete structures and its limitations.	4	4	6M
		Unit-V			
5	a	i) What is Shrinkage of concrete and types and discuss about the factors affecting the shrinkage of concrete.	3	5	6M
		ii) Define Creep and explain how creep is measured.	3	5	6M
		OR			
	b	Explain the following i) Cellular concrete ii) Polymer concrete iii) High performance concrete	2	6	12M

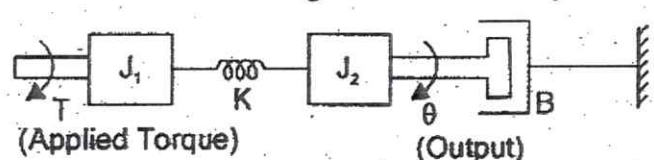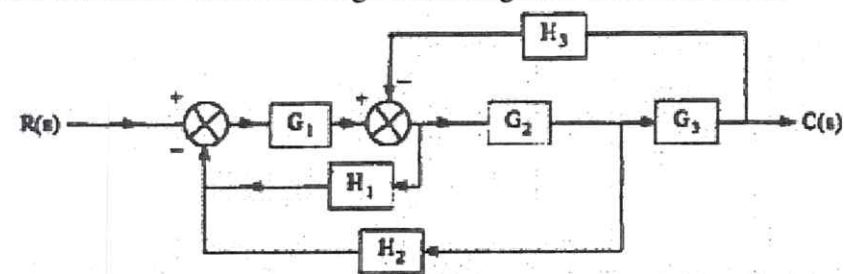### III B.Tech I Semester Supple. Examinations, April-2023

Sub Code: 19BEE5TH01

CONTROL SYSTEMS

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			
	a		i) Analyze the effects of feedback on the system performance.	K3	1	4M
			ii) Derive the transfer function of armature-controlled DC servo motor and draw its block diagram.	K3	1	8M
1			**OR**			
	b		i) Write the analogous electrical elements in force voltage analogy and force current analogy for the elements of mechanical translational system.	K2	1	4M
			ii) Obtain the transfer function of the given mechanical system. (Applied Torque) (Output)	K2	1	8M
			Unit-II			
	a		Obtain the transfer function using Block diagram reductions rules.	K3	2	12M
2			**OR**			
	b		i)The transfer function of an electronic pacemaker for controlling the rate of heartbeat is given by G(s)H(s) = 400 / S²+20S+400. Calculate different time domain specifications	K3	2	6M
			ii) Determine the error coefficients and static error for G(S)= 1/S(S+1)(S+10) , H(S) = S+2		2	6M
			Unit-III			
	a		S ketch the Root locus for $$G(s)H(s) = \frac{K}{s(s+4)(S+11)}$$ Also find range of 'K' for system to be stable.	K3	3	12M
3			**OR**			
	b		i) State the concept of relative stability.	K2	3	4M
			ii) Determine the location of closed loop poles in the S-plane using RH criterion. Comment on the stability of closed loop systems $$G(s)=\frac{10}{(S+2)(S+4)(S^2+6S+25)}$$	K3	3	8M

		Unit-IV			
4	a	i) Explain why it is important to conduct frequency domain analysis of linear control systems?	K4	4	4M
		ii) Sketch the bode plot for the following transfer function and from the plot determine phase margin and gain margin. $$G(S)=\dfrac{75(1+0.2S)}{S(S^2+16S+100)}$$	K3	4	8M
		OR			
	b	i) Write the effects of PD, PI and PID controllers	K3	4	4M
		ii) The open-loop transfer function of certain unity feedback system is given below. Sketch the Nyquist plot and determine the stability of the system. $$G(S)=\dfrac{K(1+2S)}{S(1+S)(1+S+S^2)}$$	K3	4	8M
5	a	Unit-V			
		i) State the properties of state transition matrix.	K2	5	4M
		ii) Obtain the state representation to the given system whose transfer function is $$G(s)=\dfrac{s^2+3s+4}{s^3+2s^2+3s+2}$$	K3	5	8M
		OR			
	b	i) $A=\begin{vmatrix} 1 & 0 \\ -1 & 2 \end{vmatrix}$ $B=\begin{bmatrix} 1 \\ 0 \end{bmatrix}$ $C=[1 \quad 2]$ are matrices representing a state model. Comment whether the system is controllable.	K3	5	12M

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

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

Sub Code: 19BEE5TH03   ELECTRICAL TRANSMISSION SYSTEM

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
1		**Unit-I**			
	a	i) What is a Bundled conductor? Write the advantages of it.	1	1	6M
		ii) Show that the inductance per unit length of an overhead line due to internal flux linkages is constant and is independent of the size of the conductor.	4	1	6M
		OR			
	b	i) Derive the capacitance equation between the conductor & earth of 1-transmission line.	2	1	9M
		ii) What do you mean by the Transposition of power lines?	1	1	3M
2		**Unit-II**			
	a	Show how regulation and transmission efficiency are determined for medium lines using i) Nominal T method ii) Nominal π method Illustrate your answer with suitable vector diagrams.	3	2	12M
		OR			
	b	i) Using the rigorous method, derive an expression for sending end voltage for a long transmission line.	3	2	9M
		ii) Define the voltage regulation of a transmission line.	1	2	3M
3		**Unit-III**			
	a	i) What is a traveling wave? Explain the development of such a wave on an overhead line in case of a transmission line terminated at short circuited end.	2	3	9M
		ii) List the different types of system transients?	1	3	3M
		OR			
	b	i) Derive reflection and refraction coefficients of the transmission line when receiving end is open-circuited.	2	3	10M
		ii) Define the terms surge impedance and velocity of propagation of waves w.r.t the transmission lines.	1	3	2M
4		**Unit-IV**			
	a	i) Give reasons for unequal potential distribution over a string of suspension insulators.	1	4	3M
		ii) Find the voltage distribution and string efficiency of 3 unit suspension insulator string if the capacitance of the link pins to earth and to the line are respectively 20% and 10% of the self-capacitance of each unit. If a guard ring increases the capacitance to the line of lower link pin to 35% of the self-capacitance of each unit, find the redistribution of voltage and string efficiency.	3	4	9M
		OR			
	b	i) Write the advantages of suspension insulators.	1	4	3M
		ii) A transmission line has a span of 180m between level supports. The conductor has a cross-sectional area of 129mm2, weights 1.17 kg/m and has a breaking stress of 42kg/mm2. Calculate the sag for a factor of safety of 5, allowing for a maximum wind pressure of 125kg/m2 of the projected surface.	3	4	9M

5		Unit-V			
	a	i) Define corona and list its effects	1	5	3M
		ii) Derive the expression for calculating the internal and external flux linkages for a conductor carrying current. And also derive the equation for the inductance of a single-phase line.	2	5	9M
		OR			
	b	i) Describe with a neat sketch, the construction of a 1-core belted type cable. Discuss the limitation of such cable.	2	5	10M
		ii) Write the requirements of the insulating materials used for the cables	1	5	2M

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

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NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

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

Sub Code: **19BEE5TH04**   **ELECTRICAL MEASUREMENTS**

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) Derive the necessary torque equation of PMMC instruments and explain in brief the effect of temperature changes in Ammeters.	K2	CO1	6M
		ii) With a neat sketch, illustrate the following multi-range voltmeters and multi-range ammeters	K2	CO1	6M
		OR			
	b	i) Explain deflecting, control and damping torques.	K2	CO1	6M
		ii) Enumerate the advantages and disadvantages of MI instruments.	K1	CO1	6M
		Unit-II			
2	a	Discuss the operation of single-phase induction type energy meter with a neat diagram.	K2	CO2	6M
	b	Explain the sources of errors in single phase dynamometer wattmeter.	K2	CO2	6M
		OR			
	b	i) A 50A, 230V meter on full load test makes 61 revolutions in 37s. If the normal disc speed is 520 revolutions per kWh, find the percentage error.	K3	CO2	6M
		ii) Explain the procedure for testing by phantom loading.	K2	CO2	6M
		Unit-III			
3	a	i) Draw the circuit of a Kelvins double bridge used for measurement of low resistances. Derive the condition for balance.	K3	CO3	6M
		ii) The four arms of a Wheatstone bridge are as follows: AB=100 Ω; BC=10 Ω; CD=4 Ω and DA=50 Ω. The galvanometer has a resistance of 20 Ω and is connected across BD. A source of 10V D.C. is connected across AC. Identify the resistance that should be in the arm DA for the current flowing through the galvanometer is zero?	K3	CO3	6M
		OR			
	b	Outline the Loss of charge method for the measurement of high resistance? List at least two advantages and disadvantages.	K2	CO3	12M

4	a	i) Derive the expression for measurement of unknown capacitance using Schering bridge.	K3	CO4	6M
		ii) The four arms of a Hay's bridge are arranged as follows: AB is a coil of unknown impedance; BC is a non-reactive resistor of 100 Ω; CD is a non- reactive resistor of 833 Ω in series with a standard capacitor of 0.38ΩF; DA is non-reactive resistor of 16800 Ω. If the supply frequency is 50 Hz, determine the inductance and the resistance at the balanced conditions.	K3	CO4	6M
		OR			
	b	i) Draw the circuit diagram and phasor diagram of the Maxwell's Inductance Bridge. Also develop the equations under balanced conditions.	K3	CO4	6M
		ii) *The arms of a five-node bridge are as follows:* *arm ab: an unknown impedance (R_1, L_1) in series with a non-inductive variable resistor r_1,* *arm bc: a non-inductive resistor $R_3 = 100\ \Omega$,* *arm cd: a non-inductive resistor $R_4 = 200\ \Omega$,* *arm da: a non-inductive resistor $R_2 = 250\ \Omega$,* *arm de: a non-inductive variable resistor r* *arm ec: a loss-less capacitor C = 1 µF, and* *arm be: a detector.* *An a.c. supply is connected between a and c.* *Calculate the resistance and inductance R_1, L_1 when under balance conditions $r_1 = 43.1\ \Omega$ and, $r = 229.7\ \Omega$.*	K3	CO4	6M
		Unit-V			
5	a	i) With the help of characteristics discuss the principle of operation of LVDT and its advantages.	K2	CO5	6M
		ii) What are the factors that should be considered while selecting a transducer? Explain.	K2	CO5	6M
		OR			
	b	i) Define gauge factor? Derive the expression for gauge factor.	K3	CO5	6M
		ii) What are the various advantages of electrical transducers?	K2	CO5	6M

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

NARASARAOPETA NEC ENGINEERING COLLEGE
(AUTONOMOUS)

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

Sub Code: 19BME5TH04   **HEAT POWER ENGINEERING**

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	i) What is regeneration? Draw schematic and T-s diagram for ideal regenerative cycle.	KL2	CO1	6M
		ii) A steam power plant works between pressures of 40 bar and 0.05 bar .If the steam supplied is dry saturated and the cycle of operation is Rankine cycle, find a) Cycle efficiency and b) Specific steam consumption	KL3	CO1	6M
		OR			
	b	i) Explain working of Orsat apparatus with a neat sketch.	KL2	CO1	6M
		ii) What is adiabatic flame temperature? Explain various zones in it with neat sketch.	KL2	CO1	6M
		Unit-II			
2	a	i) What is the difference between fire tube and water tube boiler.	KL2	CO2	6M
		ii) Write short notes on i) Super heater ii) Air Preheater iii) Economizer	KL1	CO2	6M
		OR			
	b	i) Explain any one induced draft system of chimney.	KL2	CO2	6M
		ii) Derive the condition for maximum discharge, efficiency of chimney.	KL3	CO2	6M
		Unit-III			
3	a	Starting from the fundamentals, show that the maximum discharge through the nozzle, the ratio of throat pressure to inlet pressure is given by (2/n+1) n/n-1 , where n is the index for isentropic expansion through the nozzle.	KL3	CO3	12M
		OR			
	b	i) Derive the equation for exit velocity of a steam nozzle.	KL2	CO3	6M
		ii) Steam is expanded in a set of nozzles from 10 bar and 200 °C to 5 bar. Neglecting the initial velocity, find the maximum area of the nozzle required to allow a flow of 3 kg/s under the given conditions. Assume that the expansion of the steam to be isentropic. Also name the type of nozzle	KL3	CO3	6M
		Unit-IV			
4	a	i) Explain the difference between an impulse turbine and a reaction turbine.	KL2	CO4	6M
		ii) What is compounding? Describe various methods of compounding with neat sketches of arrangement, pressure and velocity profiles.	KL2	CO4	6M
		OR			
		i) In one stage of a reaction turbine, both fixed and moving blades have inlet and outlet blade tip angles of 35° and 20° respectively. The mean blade speed is 80m/s and the steam consumption is 22500 kg/hr. Determine the power developed and stage efficiency if the isentropic heat drops in both fixed and moving rows is 23.5 kJ/kg in the pair.	KL3	CO4	12M

		Unit-V			
5	a	i) Describe with neat diagram a closed cycle gas turbine and explain advantages, disadvantages and applications.	KL2	CO5	6M
		ii) Explain with neat sketch the gas turbine cycles with intercooling and reheating.	KL2	CO5	6M
		OR			
	b	i) What are composite and homogeneous solid propellants? How do they work? State their merits and demerits.	KL2	CO5	6M
		ii) Differentiate between solid propellant and liquid propellant rocket engines.	KL2	CO5	6M

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

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

Sub Code: 19BEC5TH02   LINEAR AND DIGITAL IC APPLICATIONS

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) Describe an opamp 741 circuit that produces the output, $V_0 = 5V_1 - 3V_2 + 4V_3 - 7V_4$	3	1	6M
		ii) Explain in detail about logarithmic amplifier	2	1	6M
		OR			
	b	i) Draw op-amp practical integrator and explain it. Derive its Vo expression.	3	1	6M
		ii) Enumerate the types of op-amp oscillators. Explain in detail about any one sinusoidal oscillator.	2	1	6M
		Unit-II			
2	a	Design a 2 KHz square waveform generator using 555 timer for duty cycle 25 % and 50 %. Explain the steps and also draw its waveforms.	4	2	12M
		OR			
	b	i) Calculate the output voltage of R-2R ladder DAC if D0=1,D1 = 0, D2 =1, D3 =1; if bit 1 applied as 5V and bit 0 applied as 0 V. Explain the steps.	3	2	6M
		ii) Design a 4 bit R- 2R ladder network, determine the size of each step if R=10 KΩ, Rf=40KΩ and full scale output , VC = +/- 15V.	4	2	6M
		Unit-III			
3	a	i) Derive the transfer function for active butterworth second order VCVS filter	3	3	6M
		ii) Design a narrow band stop filter that rejects 1.5GHz.	3	3	6M
		OR			
	b	i) Describe IC 565 PLL with neat diagram.	2	3	6M
		ii) Enumerate various phase detectors and also compare them.	2	3	6M
		Unit-IV			
4	a	i) Construct CMOS NOR gate. Explain its operation with neat timing diagrams.	3	4	6M
		ii) Analyze the CMOS Dynamic electrical behavior, in terms of transition time, propagation delay, power consumption.	4	4	6M
		OR			
	b	i) Compare TTL and Schottky TTL Families.	2	4	6M
		ii) Realize the open collector output TTL NAND gate and also analyze the role of external pull of resistors.	4	4	6M
		Unit-V			
5	a	i) Design a full subtractor with decoder.	4	5	6M
		ii) Implement 16:1 multiplexer with 4:1 multiplexer.	4	5	6M
		OR			
	b	i) Realize a synchronous BCD Up-down counter with T flip flops.	4	5	6M
		ii) Describe various Modeling Styles of VHDL.	2	5	6M

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

Sub Code: 19BEC5TH03   **PULSE AND DIGITAL CIRCUITS**

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 RC network as differentiator with neat diagrams.	I	1	6M
		ii) Explain RL circuit response for step input with example.	II	1	6M
		OR			
	b	i) Explain RC network as integrator with neat diagrams.	I	1	6M
		ii) Explain RLC circuit response for step input with example.	II	1	6M
		Unit-II			
2	a	Explain two level clipping circuits and emitter coupled clipper.	II	2	12M
		OR			
	b	i) Explain any two practical clamping circuits.	I	2	6M
		ii) Explain diode parallel clippers.	I	2	6M
		Unit-III			
3	a	i) Explain different transistor switching times.	I	3	6M
		ii) Explain ECL realization of logic gates with example.	II	3	6M
		OR			
	b	i) Explain piecewise linear diode characteristics.	I	3	6M
		ii) Compare different logic families.	II	3	6M
		Unit-IV			
4	a	i) Explain self-bias bistable multivibrator.	I	4	6M
		ii) Explain astable multivibrator as a voltage to frequency converter.	II	4	6M
		OR			
	b	i) Explain monostable multivibrator as a voltage to time converter.	II	4	6M
		ii) Explain Schmitt trigger circuit operation.	II	4	6M
		Unit-V			
5	a	i) Explain relation between es, ed and et.	I	5	6M
		ii) Explain Miler and Bootstrap time base generators and basic principles.	II	5	6M
		OR			
	b	i) Explain transistor Bootstrap time base generator.	I	5	6M
		ii) Explain two diode and four diode sampling gates.	II	5	6M

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

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III B.Tech I Semester Supple. Examinations, April-2023
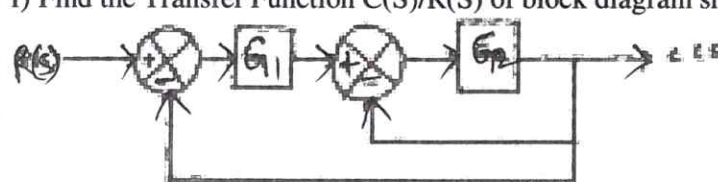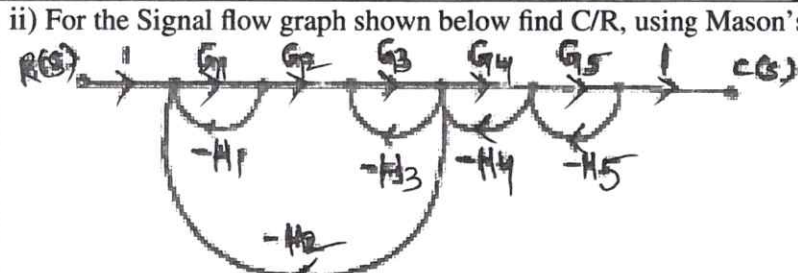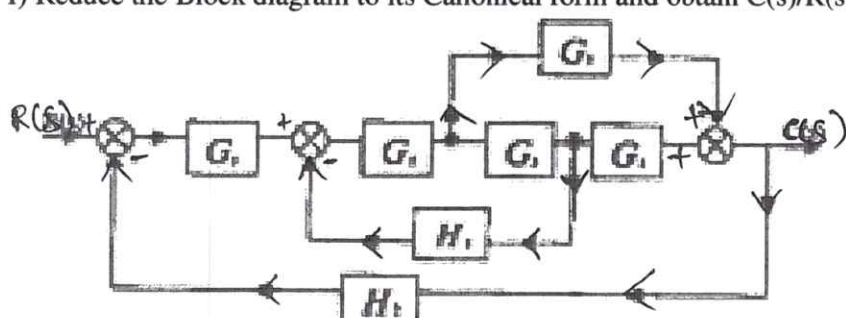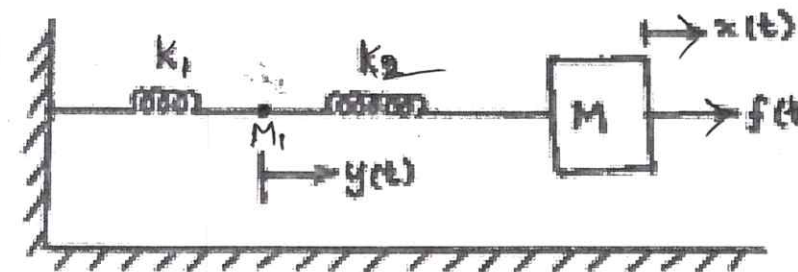
Sub Code: 19BEC5TH04 CONTROL SYSTEMS
Time: 3 hours   (ECE)   Max. Marks: 60

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

Q.No		Questions	KL	CO	M
		Unit-I			
1	a	i) Find the Transfer Function C(S)/R(S) of block diagram shown below	K4	1	4M
		ii) For the Signal flow graph shown below find C/R, using Mason's gain formula.	K3	1	8M
		OR			
	b	i) Reduce the Block diagram to its Canonical form and obtain C(s)/R(s).	K3	1	6M
		ii) Consider the Mechanical system show below and write the Differential equation	K4	1	6M
		Unit-II			
2	a	The Unity feedback system is characterized by the open loop transfer function $$G(S) = \frac{k}{(s+10)}$$ Determine the gain K, so that the system will have the damping ratio of 0.5. For this value of K, Determine the settling times, peak overshoot, and time to peak overshoot for a unit step input.	K3	2	12M

			KL	CO	M
		OR			
	b	i) A unit ramp input is applied to a unity feedback system whose transfer function is C(s)= 100/(s²+5s+100).Find the time response and steady state error	K3	2	6M
		ii) The unity feedback system is characterized by an open loop transfer function G(s) = K(2s+1)/ s(5s+1)(1+s)² with r(t) = (1+6t). Find the minimum value of K if the steady error is to be less than 0.1.	K3	2	6M
3		Unit-III			
	a	Sketch the Root Locus of the System whose open loop transfer function is G(S) = K / S (S+1) (S+3). Determine the Value of K for Damping Ratio equal to 0.5.	K5	3	12M
		OR			
	b	i) Check the stability of a stability of a system with characteristics equation S⁴+S³+20S²+9S+100 = 0 using Routh Hurwitz criterion.	K3	3	6M
		ii) Determine the range of K for stability of unity feedback system whose OLTF is $$G(s) = \frac{K}{(s+1)(s+2)}$$ Using RH criterion.	K3	3	6M
4		Unit-IV			
	a	i) A unity feedback control system has $$G(s) = \frac{ks^2}{(1+0.2s)(1+0.02s)}$$ Draw the Bode plot. Find K when GCOF = 5rad/sec.	K3	4	12M
		OR			
	b	i) A unity feedback control system has $$G(s) = \frac{1}{s^2(s+1)(1+2s)}$$ Sketch the polar plot and Find the gain and phase margin.	K3	4	12M
5		Unit-V			
	a	i) A system is represented by State equation $\dot{X}$ = AX+BU; Y=CX Where $$A=\begin{bmatrix} 0 & 1 & 0 \\ 0 & -1 & 1 \\ 0 & -1 & -10 \end{bmatrix}, B=\begin{bmatrix} 0 \\ 0 \\ 10 \end{bmatrix} \text{ and } C=\begin{bmatrix} 1 & 0 & 0 \end{bmatrix}$$ Determine the Transfer function of the system	K5	5	12M
		OR			
	b	i) The State model matrices of a system are given below $$A=\begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 0 & -2 & -3 \end{bmatrix} B=\begin{bmatrix} 0 \\ 0 \\ 1 \end{bmatrix} \text{ and } C=\begin{bmatrix} 3 & 4 & 1 \end{bmatrix}$$ Evaluate the Observability of the System using Gilberts test.	K5	5	12M

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

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

Sub Code: 19BEC5TH05 COMPUTER ORGANIZATION AND MICROPROCESSORS

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) What are the functional units of a computer and explain with diagram?	K3	1	6M
		ii) Give the characteristics of CISC and RISC.	K3	1	6M
		OR			
	b	i) Explain about System Software and Application software.	K3	1	6M
		ii) Write a short notes on Bus structures.	K3	1	6M
		Unit-II			
2	a	What is direct memory access? Explain the working procedure of DMA.	K3	2	12M
		OR			
	b	i) Explain about input-output interface.	K3	2	6M
		ii) Explain about Virtual memory.	K3	2	6M
		Unit-III			
3	a	What are the various addressing modes of 8086. Explain each with an example?	K3	3	12M
		OR			
	b	Explain about the Register organization of 8086	K3	3	12M
		Unit-IV			
4	a	Explain about minimum mode and maximum mode of 8086 system and timings diagrams for different bus operations.	K3	4	12M
		OR			
	b	i) Explain about Pentium processor architecture with diagram.	K3	4	6M
		ii) List out the differences between Nonmask able interrupt and mask able interrupts.	K3	4	6M
		Unit-V			
5	a	i) List out various modes of operation of 8255.	K3	5	6M
		ii) Explain about Stepper motor.	K3	5	6M
		OR			
	b	i) Explain about Interfacing of A/D converters.	K3	5	6M
		ii) Explain about Programmable interrupt controller 8259A	K3	5	6M

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

Sub Code: 19BCS5TH03

COMPUTER NETWORKS

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) Explain OSI reference model in detail	K2	CO2	6M
			ii) Explain in detail about categories of networks	K2	CO1	6M
			OR			
	b		i) Explain TCP/IP reference model in detail	K2	CO2	6M
			ii) Write short notes on network topologies	K1	CO1	6M
			Unit-II			
2	a		Demonstrate with an example that Hamming code is an error correction technique	K5	CO3	12M
			OR			
	b		i) Briefly explain about byte stuffing	K2	CO3	6M
			ii) Explain in detail about IEEE 802.3 standard	K2	CO3	6M
			Unit-III			
3	a		Analyze the working procedure of sliding window protocols with appropriate examples and diagrams	K4	CO3	12M
			OR			
	b		i) Differentiate pure ALOHA and slotted ALOHA	K3	CO3	6M
			ii) Explain HDLC frame format with a neat sketch and explain each field of the frame	K2	CO3	6M
			Unit-IV			
4	a		i) Sketch the header format of IPv4 packet and explain each field in it	K4	CO4	6M
			ii) Differentiate circuit switching and packet switching	K3	CO4	6M
			OR			
	b		Explain in detail the link state routing protocol	K2	CO4	12M
			Unit-V			
5	a		i) Sketch the header format of TCP segment and explain each field in it	K4	CO5	6M
			ii) Write short notes on UDP	K1	CO5	6M
			OR			
	b		i) Briefly explain the architecture of E-mail	K2	CO6	6M
			ii) Explain in detail about DNS	K2	CO6	6M

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

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

ub Code: 19BCS5TH04   •   **OOAD THROUGH UML**

irne: 3 hours   (CSE)   Max. Marks: 60

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

.No		Questions	KL	CO	M
		Unit-I			
1	a	i) What is object-oriented modeling? Write about its importance in software development life cycle.	K2	1	6M
		ii) Write about principles and importance of modeling.	K2	1	6M
		OR			
	b	i) Explain the concept of modeling the vocabulary of a system.	K2	1	6M
		ii) Explain the concept of modeling structural relationships.	K2	1	6M
		Unit-II			
2	a	What is the nature of class and object? How to identify classes and objects? Explain with suitable examples and diagrams.	K2	2	12M
		OR			
	b	i) What is advanced class? What do you mean by modeling semantics of a class? Explain.	K2	2	6M
		ii) Explain the common modeling techniques with packages.	K2	2	6M
		Unit-III			
3	a	i) Prepare an activity diagram that elaborates the details of logging into an email system. Explain the steps with neat diagram.	K3	3	6M
		ii) Draw the use case diagram for online Railway Reservation System.	K3	3	6M
		OR			
	b	i) What is activity diagram? Explain with an example.	K2	3	6M
		ii) Explain the common modeling techniques used with Interaction diagrams.	K2	3	6M
		Unit-IV			
4	a	Define the following terms i) Events & Signals ii) Process & Threads iii) Time & Space	K2	4	6M
		ii) Draw a state chart diagram for University Management System.	K3	4	6M
		OR			
	b	i) Explain the process of modeling inter process communication.	K2	4	6M
		ii) Explain and model the behavior of ATM machine with the help of a state chart diagram.	K2	4	6M
		Unit-V			
5	a	i) Draw the component diagram for Library management system.	K3	5	6M
		ii) Draw the component diagram for Aadhar management system.	K3	5	6M
		OR			
	b	i) Write and explain component and deployment diagrams.	K2	5	6M
		ii) What is deployment diagram? Explain with an example.	K2	5	6M

L: Blooms Taxonomy Knowledge Level   CO: Course Outcome   M:Marks***

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

Sub Code: 19BCI5TH06　　**DATA WAREHOUSING AND DATA MINING**

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) List out the motivating challenges of Data Mining	K2	1	6M
		ii) State and explain various Data Mining Tasks	K2	1	6M
		OR			
	b	i) Categorize the different data sets and explain about each briefly	K2	1	6M
		ii) List and discuss the issues related to applications	K2	1	6M
		Unit-II			
2	a	Summarize the data pre-processing techniques	K2	2	12M
		OR			
	b	i) Similarity and Dissimilarity between Simple Attributes	K2	2	6M
		ii) Similarities and Dissimilarity between Data Objects	K2	2	6M
		Unit-III			
3	a	i) What is Data Warehouse? Explain Multidimensional Data Model.	K2	3	6M
		ii) Compare and contrast OLAP and OLTP	K2	3	6M
		OR			
	b	i) Design star & snowflake schema for "Hotel Occupancy" considering dimensions like Time, Hotel, Room, etc.	K2	3	6M
		ii) State and explain data warehouse back-end tools and utilities	K2	3	6M
		Unit-IV			
4	a	i) Explain the general approach for solving a classification problem	K4	4	6M
		ii) Write the algorithm for decision tree induction	K4	4	6M
		OR			
	b	i) Why naive Bayesian classification is called "naive"? Briefly outline the major ideas of Naive Bayesian classification.	K4	4	6M
		ii) How to evaluate the performance of a classifier	K4	4	6M
		Unit-V			
5	a	i) Explain about frequent itemset generation in FP -growth algorithm.	K4	4	6M
		ii) Explain about the Apriori principle.	K4	4	6M
		OR			
	b	i) Write DBSCAN clustering algorithm and estimate time & space complexity	K4	5	6M
		ii) State and discuss the issues in cluster evaluation	K4	5	6M

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

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NEC NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

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

Sub Code: 19BCI5TH01　　　　**OPERATING SYSTEMS**　　　　Max. Marks: 60
Time: 3 hours　　　　　　　　　(Common to CSE, IT)

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 Operating system functions	2	1	6M
		ii)Explain Process Management and Memory Management	2	1	6M
		OR			
	b	i) Explain different operating system structures	2	1	6M
		ii) Discuss various system calls	2	1	6M
		Unit-II			
2	a	Compare FCFS and round Robin process scheduling . One can implement FCFS scheduling using Round Robin scheduling. Justify.	3	2	12M
		OR			
	b	i) Explain Process State diagram with example. Explain about inter process communication.	2	2	6M
		ii) Explain about process scheduling criteria.	2	2	6M
		Unit-III			
3	a	i) What is critical section problem? What is semaphore?	2	3	6M
		ii) Explain solution for bounded buffer problem using semaphores.	2	3	6M
		OR			
	b	i) Explain Contiguous memory allocation and its advantages and disadvantages.	2	3	6M
		ii) Distinguish between internal fragmentation and External fragmentation.	2	3	6M
		Unit-IV			
4	a	i) What is the need of demand paging? Explain copy n write.	2	4	6M
		ii) Explain FIFO and optimal page replacement algorithms.	2	4	6M
		OR			
	b	i) What are the necessary and sufficient conditions for occurrence of deadlock?	2	4	6M
		ii) Explain safety algorithm with example.	2	4	6M
		Unit-V			
5	a	i) Explain different file attributes.	2	5	6M
		ii) Explain and compare different file access methods	2	5	6M
		OR			
	b	i) Explain linked list file allocation method.	2	5	6M
		ii) Compare and contrast SCAN and C-Scan disk Scheduling algorithms	3	5	6M

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

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NEC NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

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

Sub Code: 19BCI5TH02

Time: 3 hours

COMPILER DESIGN

(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) Define Compiler. Explain the language processing system.	K2	1	6M
			ii) Briefly Explain two passes of a compiler.	K2	1	6M
			OR			
	b		i) Explain the role of lexical analyzer and their issues.	K2	1	6M
			ii) Regular expressions are important for lexical analysis? Explain the reason with examples.	K2	1	6M
			Unit-II			
2	a		Explain the procedure for eliminating ambiguity and eliminating left recursion from a grammar. Give an example.	K3	2	12M
			OR			
	b		i) Compute FIRST and FOLLOW for the grammar: $E \to T E'$, $E' \to +T E'/\varepsilon$, $T \to F T'$, $T' \to *F T'/\varepsilon$, $F \to (E) \mid id$	K3	3	6M
			ii) Present the formal definition and notational conventions of CFG.	K3	1	6M
			Unit-III			
3	a		Consider the grammar $E \to E+T \mid E-T \mid T$, $T \to T*F \mid T/F \mid F$, $F \to (E) \mid id$ Show the sequence of moves made by shift reduce parser for the input string id+id*id is accepted or not.	K3	3	12M
			OR			
	b		Construct SLR Parsing table for the grammar $E \to E+T \mid T$, $T \to T*F \mid F$, $F \to (E) \mid id$ by giving LR(0) items.	K3	3	12M
			Unit-IV			
4	a		i) Discuss syntax directed definition by defining synthesized and inherited attributes	K2	3	6M
			ii) Explain quadruples, Triples, indirect triples for the expression a = b * - c + b * - c. And also DAG.	K2	4	6M
			OR			
	b		i) Explain the procedure for translation scheme to convert infix to postfix	K2	3	6M
			ii) What are the different storage allocation strategies? Explain	K2	4	6M
			Unit-V			
5	a		i) Write short notes on basic blocks and flow graphs	K3	5	6M
			ii) Explain in detail about peephole optimization	K3	5	6M
			OR			
	b		i) Discuss Semantics-Preserving Transformations	K3	5	6M
			ii) Discuss Loop Optimization with suitable examples	K3	5	6M

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

Sub Code: 19BIT5TH02   **WEB DEVELOPMENT USING MEAN STACK**

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			
	a	i) What is the difference between AngularJS and Angular?	1	1	6M
		ii) Describe MVC in reference to angular.	2	1	6M
1		**OR**			
	b	i) What IDE's are currently used for the development of AngularJS	1	1	6M
		ii) What are the directives in AngularJS	1	1	6M
		Unit-II			
	a	What do you understand by validation of data in AngularJS? Give example	1	2	12M
2		**OR**			
	b	i) What are the controllers in AngularJS	1	2	6M
		ii) List out any 4 CLI commands	1	2	6M
		Unit-III			
	a	i) How can you assess REPL and Node.Js	1	3	6M
		ii) Explain Node package Manager role.	1	3	6M
3		**OR**			
	b	i) Give a brief on the working mechanism of Node.Js	1	3	6M
		ii) Explain Node.js web application architecture	1	3	6M
4		**Unit-IV**			
	a	i) Define Event Emitter of Node.js	1	4	6M
		ii) What is event-driven programming in Node.js	1	4	6M

		OR			
	b	i) What are the key differences between Angular and Node.js?	1	4	6M
		ii) How to access files system in Node.js	1	4	6M
5		Unit-V			
	a	i) What are the data types in MongoDB?	1	5	6M
		ii) How is Querying done in MongoDB	1	5	6M
		OR			
	b	i) Explain the process of Sharding.	2	5	6M
		ii) What are Databases in MongoDB? Explain their usage.	2	5	6M

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

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

Sub Code: 19BIT5TH03   **DESIGN AND ANALYSIS OF ALGORITHMS**

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) List out the steps that need to design an algorithm.	K3	1	6M
			ii) Discuss the concepts of asymptotic notations and its properties.	K3	1	6M
			OR			
	b		i) Define time complexity and space complexity.	K3	1	6M
			ii) Write an algorithm for adding n natural numbers and find the space required by that algorithm.	K3	1	6M
			Unit-II			
2	a		Explain the working of Strassen's Matrix Multiplication with the help of divide and conquer method.	K3	2	12M
			OR			
	b		i) Explain Merge sort algorithm with example.	K3	2	6M
			ii) Write recursive binary search algorithm and analyse its complexity in worst case.	K3	2	6M
			Unit-III			
3	A		i) Illustrate the construction of Minimum Cost Spanning tree with neat diagram.	K3	3	12M
			OR			
			i) Explain about Single source shortest path problem with an example.	K3	3	12M
			Unit-IV			
4	A		i) Explain the general method of dynamic programming	K3	4	6M
			ii) Find an optimal solution to the 0/1 knapsack instance n=7, M=15, (P1….P7)=(10,5,15,7,6,18,3) (W1….W7)=(2,3,5,7,1,4,1)	K3	4	6M
			OR			
	B		Illustrate the Travelling salesman problem with neat diagram	K3	4	12M
			Unit-V			
5	A		Write the backtracking algorithm for the sum of subsets problem using the state space tree corresponding to m=35, w=(20,18,15,12,10,7,5).	K3	5	12M
			OR			
	B		Device backtracking algorithm to find all solutions to the n-queens problem and represent the solution space in state space tree.	K3	5	12M

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

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NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

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

Sub Code: 19BIT5TH04   **SOFTWARE ENGINEERING**

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) Explain Waterfall Model. Discuss the problems that are encountered when the waterfall model is applied?	K3	1	8M
		ii) Exemplify levels of capability maturity model.	K3	1	4M
	OR				
	b	i) What are paradigms in software development? Describe each in detail.	K3	1	6M
		ii) Discuss the software crisis.	K3	1	6M
		Unit-II			
2	a	What is requirement engineering? Describe the techniques used to elicit requirements.	K3	2	12M
	OR				
	b	i) Explain the various characteristics and components of a Software Requirement Specification (SRS)	K2	2	6M
		ii) Describe the pros and cons of structured analysis in software engineering.	K3	2	6M
		Unit-III			
3	a	i) Compare and contrast Function oriented design and Object oriented design.	K2	3	6M
		ii) Describe the ideal requirement of Cohesion and Coupling for a good software design.	K4	3	6M
	OR				
	b	i) Justify "Design is not coding and coding is not design".	K3	3	6M
		ii) Explain in detail the characteristics of a good design and describe software design principles.	K3	3	6M
		Unit-IV			
4	a	i) What do you mean by boundary value analysis? Give two examples of boundary value testing.	K3	4	4M
		ii) Design a black box test case suit to test a program that finds the age of a person by taking the date of birth as an input. Draw a control flow graph of your program and find its cyclomatic complexity.	K4	4	8M
	OR				
	b	i) What are the various testing strategies for software testing? Discuss them briefly.	K3	4	6M
		ii) How is testing different from debugging? Explain by taking a suitable example.	K4	4	6M
		Unit-V			
5	a	Define the mechanism of cost estimation for a Software project. Explain the COCOMO model.	K3	5	12M
	OR				
	b	i) What are Software Metrics? Explain how to track those metrics?	K3	5	6M
		ii) Explain the activities of the software quality assurance group to assist the software team in achieving high quality.	K3	5	6M

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

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

Sub Code: 19BIT5TH05 CRYPTOGRAPHY AND NETWORK SECURITY

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) Differentiate between Active attacks and Passive Attacks	K2	CO1	6M
		ii) Explain the operations, requirements, components of Network security model.	K4	CO2	6M
		OR			
	b	i) Use Caesar cipher with key =15 to encrypt the message "Hello".	K2	CO1	6M
		ii) Discuss the various principles involved in private and public key cryptography	K2	CO5	6M
		Unit-II			
2	a	Draw the general structure of DES. Explain the encryption and decryption process. Discuss in detail block cipher modes of operation	K3	CO3	12M
		OR			
	b	i) Explain in detail Feistel Block Cipher structure with neat sketch.	K4	Co2	6M
		ii) Write a note on Block Cipher Design Principle	K2	CO1	6M
		Unit-III			
3	a	i) State and explain Euler's theorem.			6M
		ii) Perform decryption and encryption using RSA algorithm with p=3, q=11, e=7 and N=5.	K3	CO3	6M
		OR			
	b	i) Users A and B use the Diffie Hellman key exchange technique, a common prime q=11 and a primitive root alpha=7.	K2	CO4	6M
		ii) How man in middle attack can be performed in Diffie Hellman algorithm	K2	CO6	6M
		Unit-IV			
4	a	i) Describe HMAC algorithm. Comment on the security of HMAC.	K2	CO4	6M
		ii) Differentiate digital signature from digital certificate.	K2	CO5	6M
		OR			
	b	i) Illustrate in detail about the message authentication code and its requirements	K2	CO6	6M
		ii) Describe the steps in finding the message digest using SHA-512 algorithm.	K3	CO3	6M
		Unit-V			
5	a	i) Write about Kerberos in detail	K2	CO1	6M
		ii) Write the methodology involved in computing the keys in SSL/TLS protocol	K3	CO3	6M
		OR			
	b	i) Explain about Secure Electronic Transaction(SET) in detail with neat diagram	K2	CO1	6M
		ii) What is Firewall? What are the various Types of Firewalls? Explain each firewall purpose	K4	CO2	6M