NEC ENGINEERING COLLEGE (AUTONOMOUS)

III B.Tech I Semester Regular Examinations, February-2022

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   (5X12=60M)

Q.No			Questions	KL	CO	M
1			**Unit-I**			
	a		i) Explain the characteristics of entrepreneurs	K2	CO1	6M
			ii) Discuss the role of entrepreneurship in Economic Development	K2	CO1	.6M
			OR			
	b		i) Discuss the Social Responsibilities of Entrepreneur	K2	CO1	6M
			ii) Outline the Financial Support of Commercial Banks to entrepreneurship	K2	CO1	6M
2			**Unit-II**			
	a		Discuss the steps in creativity process	K6	CO2	12M
			OR			
	b		i) Explain the factors affecting creativity	K6	CO2	6M
			ii) Discuss the importance of innovation	K6	CO2	6M
3			**Unit-III**			
	a		i) Discuss the objectives of EDPs	K6	CO3	6M
			ii) Explain the need for training for entrepreneurs	K6	CO3	6M
			OR			
	b		i) Discuss the phases of EDP for new entrepreneurs	K6	CO3	6M
			ii) Develop and appropriate training programme to entrepreneurial spirit	K6	CO3	6M
4			**Unit-IV**			
	a		i) Explain the meaning of a project	K5	CO4	6M
			ii) Discuss the sources of new ideas.	K5	CO4	6M
			OR			
	b		i) Evaluate project feasibility study	K5	CO4	6M
			ii) Outline project evaluation techniques	K5	CO4	6M
5			**Unit-V**			
	a		i) Explain the meaning and definition of small and micro entrepreneurs	K4	CO5	6M
			ii) Discuss the importance of small and micro enterprises	K4	CO5	6M
			OR			
	b		i) Analyze the causes of sickness in small business and suggest remedies	K4	CO5	6M
			ii) Outline the factors influencing growth of small and micro entrepreneurs	K4	CO5	6M

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

Sub Code: 19BCE5TH02   **STRUCTURAL ANALYSIS-II**
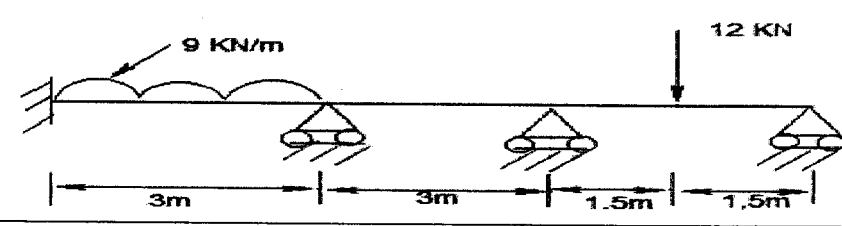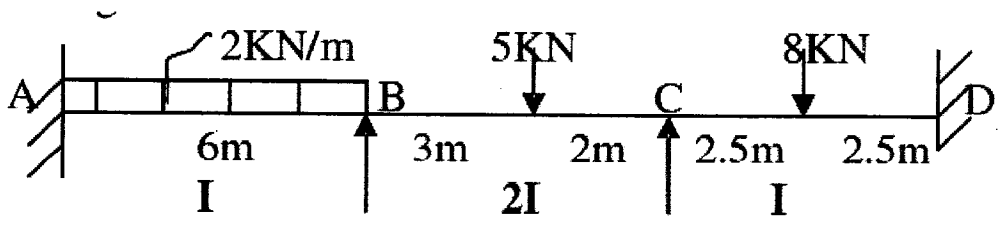
Time: 3 hours   (CE)   Max. Marks: 60

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

Q. No		Questions	KL	CO	M
		Unit-I			
1		A propped cantilever of span 9.2m is fixed at one end and propped at the other end and carries a UDL of 12.7kN/m on its whole span. Calculate the prop reaction and draw the shear force and bending moment diagrams	K3	1	12
		OR			
		A fixed beam of span 12m carries a central point load of 55kN along with a UDL of 25kN/m on its whole span. Calculate the fixed end moments for the beam. Also draw the shear force and bending moment diagrams.	K3	1	12
		Unit-II			
2		A two span continuous beam ABC is fixed at A and simply supported at B and C. The span AB=6m and span BC=5m. The span AB carries a UDL of 23 kN/m and span BC carries a central point load of 26kN. EI is constant for the whole beam. Find the moments and reactions at all the supports and draw the bending moment diagram using Clapeyron's theorem of three moments	K3	2	12
		OR			
		Using Clapeyron's theorem, solve the problem of the continuous beam as shown in Figure EI is constant throughout	K3	2	12
		Unit-III			
3		Draw BMD for the Continuous beam shown in fig. by using Moment Distribution method.	K3	4	12
		OR			
		Analyse the continuous beam shown in Fig. by moment distribution method and draw the bending moment diagram	K4	4	12

Unit-IV

		KL	M
Using the Kani's method analyse the Beam shown in fig		K4	5

12I

OR

		KL	M
Analyse the beam shown below by Kani's method.		K4	5

12I

Unit-V

		KL	M
Analyze a continuous beam as shown in in figure by flexibility matrix method. Take EI constant throughout		K4	6

12I

OR

		KL	M
Analyze continuous beam ABC of which A end is fixed, B&C are simply supported with roller supports. The lengths of the two spans AB and BC are 5m and the entire beam is subjected to UDL of intensity 10 KN/m using flexibility method.		K4	6

12I

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

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III B.Tech I Semester Regular Examinations, February-2022

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
1			**Unit-I**			
	a	i)	Write short notes on balanced, under reinforced and over reinforced sections with sketches	K1	1	6M
		ii)	What would be the increase in the moment of resistance if it is reinforced with 2-16 mm bars of Fe 500 grade in compression at an effective cover of 40 mm. Whether the neutral axis would shift upwards or downwards, and by what amount?	K3	1	6M
			OR			
	b	i)	Find the moment of resistance of a beam section 250 mm x 500 mm deep is reinforced with 2- 16 mm bars in tension at an effective cover of 40 mm. Use M20 concrete and Fe 500 grade of steel.	K3	1	6M
		ii)	A doubly reinforced beam 300 mm x 680 mm effective is reinforced on tension and compression side with 4 numbers of 25 mm diameter bars. Compression steel is placed 40 mm from top of the beam. If the beam carries a bending moment of 215×10^6 N-mm, find the stresses induced in steel and concrete. Take m = 13.33	K3	1	6M
2			**Unit-II**			
	a	I)	A T-beam of flange size 700 mm x 120 mm and web size 350 mm x 680 mm is subjected to factored bending moment of 215 kN-m, factored shear of 150 kN and factored torsion of 105 kN-m. Design the reinforcements by using Limit state method. Take cover to centre of steel as 50mm.	K3	2	12M
			OR			
	b	i)	What are the assumptions made in limit state of collapse in flexure	K2	2	6M
		ii)	Explain the Analysis and design for flexure of singly reinforced sections	K2	2	6M
3			**Unit-III**			
	a	I)	A simply supported beam with clear span 6 m, width 400 mm and effective depth 560 mm carries a limit state load of 175 kN/m inclusive of self-weight, dead load and live load. It is reinforced with 4 bars of 28 mm diameter tension steel which continue right into the support. Take fck = 20 N/mm², fy= 250 N/mm², Design shear reinforcement	K3	3	12M
			OR			
	b	i)	Explain about development length with sketch	K2	3	6M
		ii)	Explain the design concept of bond	K2	3	6M
4			**Unit-IV**			
	a	I)	Design a R.C.C. column to carry an axial load of 2000N. The size of the column is restricted to 600 mm square. The effective height of column is 9 m. Use M20 concrete and Fe 415 .	K3	4	12M
			OR			
	b	ii)	Design a rectangular footing of uniform thickness for an axially loaded column of size 300 mm x 600 mm. Load on the column is 1150 kN. Safe bearing capacity of the soil is 200 kN/m² . Use M20 concrete and Fe 415 steel.	K3	4	12M

Unit-V

5	a	I) Design a R.C slab for a room having inside dimensions 3m X 6m. The thickness of the supporting wall is 300mm. the slab carries 100mm thick at its top. The unit weight of which may be taken as $19000N/m^3$. The L.L on the slab may be taken as $2500N/m^2$. Assume the slab to the S.S at the ends. Use M20 concrete and Fe 415 steel	K3	5	12M
		OR			
	b	ii) Design a two way slab of 2m x 3m by Limit state method, simply supported on all four sides. The thickness of wall is 200mm. The corners of the slab are not held down. It has to carry a characteristic live load of 10 kN/m^2.	K3	5	12M

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III B.Tech I Semester Regular Examinations, February-2022

Sub Code: 19BCE5TH04

Time: 3 hours

SOIL MECHANICS

(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) What is geological cycle?Explain the phenomena of formation of soils?	K2	1	6M
			ii) Develop a relationship between **es=wg**	K3	1	6M
			OR			
	b		i) What are the major soil deposits of india?Explain their characteristics	K2	1	6M
			ii) A sample of dry soil weighs 68 gm.Find the volume of voids if the total volume of sample is 40 ml and specific gravity of solids is 2.65.also determine the void ratio.	K3	1	6M
			Unit-II			
2	a		Briefly explain about the laboratory methods of permeability test with neat sketch	K2	3	12 M
			OR			
	b		i) Discuss the construction of kaolinite,montmorrillonite,illite mineral group	K2	2	6M
			ii) Explain Calibration and Correction of Hydrometer method?	K2	2	6M
			Unit-III			
3	a		i) Explain in detail the construction of Newmark's chart with an influence value of 0.005.	K3	3	6M
			ii) A soil profile consists of a surface layer of sand 3.5m thick $\rho=1.65Mg/m^3$ an intermediatde layer of clay 3 m thick $\rho=1.65Mg/m^3$ and the bottom layer of gravel 3.5m $\rho=1.925Mg/m^3$ the water table is at the upper surface of clay layer.Determine the effective pressure at various levels immediately after placement of surcharge load of 58.86 KN/m² to the ground surface .	K3	3	6M
			OR			
	b		i) What is quicksand condition? Derive the expression for the critical hydraulic gradient.	K2	3	6M
			ii) Explain the effective stress in soils saturated by **capillary action.**	K2	3	6M
			Unit-IV			
4	a		i) What are the factors that affect the compaction? Discuss in brief.	K1	4	6M
			ii) Discuss Terzaghis theory of consolidation?	K2	4	6M
			OR			
	b		i) Explain compaction control by using proctor needles	K2	4	6M
			ii) Explain consolidation test?	K2	4	6M
			Unit-V			
5	a		i) Write a note on the laboratory box shear test.	K1	5	6M
			ii) A vane, 10cm long and 8 cm in diameter, was pressed into soft clay at the bottom of a bore hole torque was applied and gradually increased to 45N-m when failure took place. Subsequently, the vane rotated rapidly so as to completely remould the soil. The remoulded soil was sheared at a torque of 18N-m. Calculate the cohesion of the clay in the natural and remoulded state and also the value of the sensitivity?	K3	5	6M
			OR			
	b		i) Write a note on the laboratory triaxial shear test.	K1	5	6M
			ii) Explain briefly about the Mohr's stress circle.	K2	5	6M

Sub Code: 19BCE5TH05   **CONCRETE TECHNOLOGY**
ιe: 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 in detail the heat of hydration of Bougue's compounds	K2	CO1	6M
			ii) What are the main compounds in Portland cement along with composition and explain their properties?	K1	CO1	6M
			OR			
	b		i) What is consistency of cement and how it is tested?	K1	CO1	6M
			ii) Explain about the different tests conducted on cement in the laboratory to check its suitability	K1	CO1	6M
			Unit-II			
2	a		i)List out various tests on aggregates in detail.	K1	CO2	12 M
			OR			
	b		i) Write about gap graded and well graded aggregate.	K2	CO2	6M
			ii)Explain about alkali aggregate reaction and what precautions are necessary to minimize it.	K2		6M
			Unit-III			
3	a		i) Explain procedure for determination of workability of concrete using Vee-Bee Consistometer test with neat diagram.	K3	CO4	6M
			ii) Calculate the Gel/space ratio and the theoretical strength of a sample of concrete made with 500g of cement and 0.6w/c ratio, on i) Full hydration ii) 70% hydration	K4	CO4	6M
			OR			
	b		i) What is segregation and bleeding of concrete why they occur, discuss how to prevent them	K5	CO4	6M
			ii) Write about mineral admixture and chemical admixtures.	K2	CO4	6M
4	a		**Unit-IV**			
			i) Design a concrete mix for construction of an elevated water tank. The characteristic compressive strength of concrete is 30MPa at 28days. Assume standard deviation as 4MPa. The specific gravities of coarse and fine aggregates are 2.64 and 2.68 respectively. The dry rodded bulk density of coarse aggregate is 1600Kg/cum, and fineness modulus of sand is 2.80. OPC (Type I) is to be used. A slump of 50mm is required. The water absorption of coarse aggregate is 1% and free surface moisture in sand is 2%. Assume any other data missing suitably. Use ACI method of mix design.	K4	CO3	6M
			ii) Design a M20 grade concrete mix by BIS method with the following data: specific gravity of cement, coarse aggregate and fine aggregate are: 3.05, 2.60 and 2.62 respectively. Water absorption for coarse aggregate and fine aggregate are 0.70 and 0.60 percentage respectively. Free moisture Nil. Degree of quality control good and exposure moderate. Determine the quantities of ingredients in kg/m3 of concrete	K4	CO3	6M

		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 daytime at 20^0C and night time at 10^0C	K6	CO3	6M
		ii) Discuss about the rebound hammer test method on concrete structures and its limitations	K5	CO3	6M
5		Unit-V				
	a	i) What is the need to study fiber reinforced concrete and explain briefly the factors effecting properties of fiber reinforced concrete?	K6	CO6	6M
		ii) Describe the role of aggregate in creep of concrete.	K3	CO5	6M
		OR				
	b	i) Write a short note on a) short crete b) self-compacted concrete c) light weight aggregate concrete	K6	CO6	6M
		ii) Explain applications of various sulphur-infiltrated concrete	K4	CO5	6M

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III B.Tech I Semester Regular Examinations, February-2022

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) Describe the areas of flood hazard in India. What causes floods?	K2	CO2	6M
		ii) What are causes for the Tsunami 2004 which causes heavy life and property loss along coastal area of Andhra Pradesh and Tamilnadu. Specify its epicenter and magnitude	K6	CO2	6M
			OR			
	b	i) Differentiate between endogenous hazards and exogenous hazards	K3	CO1	6M
		ii) Write down the causes and distribution of earthquake clearly	K2	CO2	6M
			Unit-II			
2	a	Explain clearly about landscape approach and perception approach of disaster management	K1	CO1	12M
			OR			
	b	i) Under what category will you put Bhopal Gas tragedy in India?	K6	CO2	6M
		ii) Discuss in detail about various mechanism implemented by UNFCCC to reduce and mitigate the global warming?	K5	CO1	6M
			Unit-III			
3	a	i) Draw neatly about the fundamental elements of solid waste management	K1	CO3	6M
		ii) Explain briefly about post-disaster stages/steps to be implemented from government side for faster recovery.	K2	CO2	6M
			OR			
	b	Discuss the key mechanisms to combat bioterrorism and its treat levels in megacities. State your opinion on Covid-19 in your perspective of bioterrorism with justification	K6	CO4	12M
			Unit-IV			
4	a	Discuss the need of disease surveillance system in developing countries like India. Justify with any one case study.	K3	CO4	12M
			OR			
	b	i) Define Risk and vulnerability, also state the factors affect risk and vulnerability to disasters?	K1	CO4	6M
		ii) Discuss about the role and policies of National disaster management plan in India?	K1	CO3	6M
			Unit-V			
5	a	i) What are the legal provisions available to ensure fire safety compliance in public buildings?	K1	CO3	6M
		ii) What is meant by social and environmental vulnerability?	K1	CO4	6M
			OR			
	b	Discuss the role of Environmental impact assessment studies in promoting the sustainable development. Justify with example.	K3	CO3	12M

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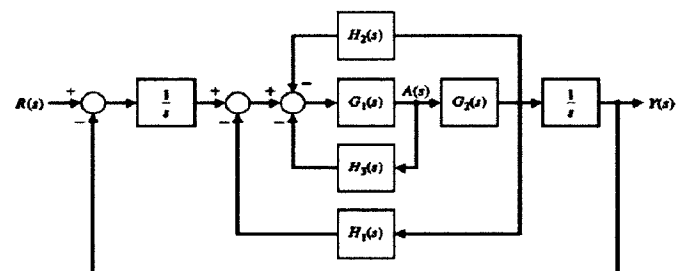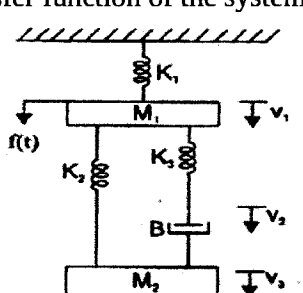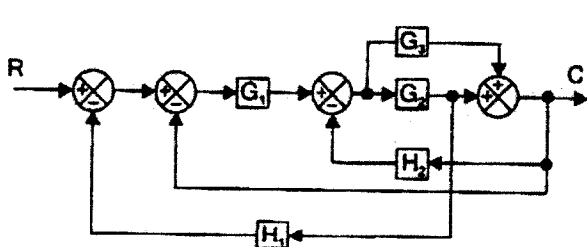**Sub Code: 19BEE5TH01**　　　　　**CONTROL SYSTEMS**

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			
1	a	i) Distinguish open loop and closed loop systems by giving suitable examples and also highlight their merits and demerits.			6M
		ii) Obtain the transfer function Y(s)/R(s) from block diagram shown below figure by using the signal flow graph method.			6M
		OR			
	b	i) Calculate the transfer function of the system given below			6M
		ii) When is a control system said to be robust? Explain with suitable example.			6M
2		**Unit-II**			
	a	Evaluate the position velocity and acceleration error coefficients of the unity feedback system having forward loop transfer function as $G(S)=50/(1+S)(1+0.25S)$			6M
		The open-loop transfer function of a unity feedback control system is given by $G(s)=50/s(s+5)$. Find the natural frequency of response, damping ratio, damped frequency and time constant.			6M
		OR			
	b	i) Convert this block diagram into signal flow graph and determine its transfer function C/R			6M
		ii) The open-loop transfer function of a unity feedback control system is given by $G(s)=10/s(s+2)$. Find the natural frequency of response, damping ratio, damped			6M

		frequency and time constant.			
		Unit-III			
3	a	i) Determine the stability of the closed loop system whose open loop transfer is G(S)=10(1+2.5S)/S(S+1)(3S+1)(0.5S+1) using Routh-Hurwitz criterion			6M
		ii) Sketch the root locus for unity feedback system whose open loop transfer function is G(S)=K(S+0.5)/S(S+1.5)(S+2.5)			6M
		OR			
	b	i) Using R-H criterion comment on stability for given characteristic equation $S^7+9S^6+24S^4+24S^3+24S^2+23S+15=0$, and determine the location of roots in S-plane			6M
		ii) Develop the root locus of the open-loop transfer function as given below G(s)H(s)=K/S(S+2)(S²+2S+5)			6M
4	a	**Unit-IV**			
		i) Damping factor and natural frequency of the system are 0.12 and 84.2 rad/sec respectively. Determine the rise time (tr), peak time (tp), maximum peak overshoot (m_p) and settling time (ts).			6M
		ii) Determine the range of K for which closed loop system is stable and the Nyquist Plot for the system whose open loop transfer function is G(S)H(S)=K/S(S+2)(S+10)			6M
		OR			
	b	i) With the help of Nyquist plot assess the stability of a system G(s) = 5/S(S+2). What happens to stability if the numerator of the function is changed from 5 to 50?			6M
		ii) Determine K so that the system is stable with gain margin is 2db and phase margin is 45degrees for the system given G(S)=Ke$^{0.25}$/S(S+2)(S+8) and Draw its Bode Plot			6M
5	a	**Unit-V**			
		i) Determine the state and output equations in vector matrix form for the system whose transfer function is given by G (s)=(S+2)/S(S²+5S+6)			6M
		ii) Discuss the concept of controllability and observability with an example			6M
		OR			
	b	i) Consider the matrix A=[1 2 3;2 7 4;5 7 9]. Compute e^{At}?			6M
		ii) Discuss about the properties of state transition matrix and prove those properties			6M

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

NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

III B.Tech I Semester Regular Examinations, February-2022

Sub Code: 19BEE5TH02   POWER ELECTRONICS

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) Discuss the transfer, output and switching characteristics of IGBT.	K2	1	12M
			OR			
	b		i) Compare the performance characteristics of MOSFET with BJT.	K4	1	5M
			ii) Highlight on the need of series and parallel operation of SCRs.	K4	1	7M
			Unit-II			
2	a		i) Describe the working principle of operation of single phase half wave controlled converter with RL load with neat waveforms.	K3	2	12M
			OR			
	b		i) Describe with a neat sketch the working principle of operation of Fully Controlled Converters with RLE load and freewheeling diode.	K3	2	12M
			Unit-III			
3	a		i) Describe the effect of source inductance in the operation of three phase converter, indicating clearly the conduction of various thyristors during one cycle.	K4	3	12M
			OR			
	b		i) Explain the working of single phase dual converter with neat circuit diagram and necessary waveforms.	K2	3	12M
			Unit-IV			
4	a		i) Explain the operation of Single Phase AC Voltage Controllers with R-load with neat waveforms.	K3	4	12M
			OR			
	b		i) Discuss on the operation of bridge configuration of Single phase mid-point Cyclo-	K3	4	8M

			KL	CO	M
		Converters with inductive load.			
		ii) Write short notes on bidirectional converters.	K2	4	4M
5		**Unit-V**			
	a	i) Describe the working principle of buck-boost converter with necessary circuit and waveforms.	K2	5	12M
		OR			
	b	i) Illustrate the principle of operation of 3 phase voltage source inverter with 180°conduction mode with necessary waveforms and circuits. Also obtain the expression for line to line voltage.	K4	5	12M

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

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III B.Tech I Semester Regular Examinations, February-2022

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
			Unit-I			
1	a		i) Derive the expression for the capacitance per km of a single phase line without ground effect.	3	1	6M
			ii) A single phase transmission line has two parallel conductors 3m apart. The radius of each conductor being 1 cm. Calculate the loop inductance per km length of the line if the material of the conductor is i) Copper with $\mu r=1$ and ii) Steel with $\mu r=100$.	4	1	6M
			OR			
	b		i) Explain the necessity of transposition in transmission lines.	2	1	6M
			ii) Find the capacitance of a single phase transmission line 40km long consisting of two parallel lines each 4mm in diameter and 2m apart. Determine the capacitance of the same line taking into account effect of ground. The height of conductors above ground is 5m?	5	1	6M
			Unit-II			
2	a		Derive the ABCD constants for a medium transmission line which can be analysed using i) Nominal–π line ii) Nominal–τ line?	3	2	12M
			OR			
	b		i) Derive an expression for voltage regulation of a short transmission line.	3	2	6M
			ii) A single phase transmission line delivers 2 MW of power at the receiving end at a voltage of 33 kV and 0.9 pf lagging. The total resistance of the line is 10Ω and the total inductive reactance is 18Ω. Evaluate: (i) Percentage voltage regulation. (ii) Sending end power factor.	5	2	6M
			Unit-III			
3	a		i) Discuss the phenomenon of wave reflection and refraction.	2	3	6M
			ii) A 200 KV, 3 μs, rectangular surge travels on a line of surge impedance of 400Ω. The line is terminated in a capacitance of 3000 pf. Find an expression for voltage across the capacitance.	5	3	6M
			OR			
	b		i) Derive an expression for the reflection and refraction coefficients of travelling waves in a transmission line.	3	3	6M
			ii) Explain Bewley's Lattice diagram and give it's uses.	2	3	6M

				KL	CO	M
			Unit-IV			
4	a		i) Derive mathematical expression for voltage distribution over a string of suspension insulators.	3	4	8M
			ii) Discuss the advantages of suspension type insulators over pin type insulators.	2	4	6M
			OR			
	b		i) A string of six suspension insulators is to be graded to obtain uniform distribution of voltage across the string. If the pin to earth capacitors are equal to C, and the self-capacitance of the top insulator is 10 C, find the mutual capacitance of each unit in terms of C.	5	4	8M
			ii) Explain why the potential distribution is not uniform over a string of suspension insulators?	4	4	4M
5			Unit-V			
	a		i) What are the properties of insulating materials for cables?	4	5	4M
			ii) What is corona? Discuss various factors affecting corona.	2	5	8M
			OR			
	b		i) Discuss briefly about the electrostatic stress in a single-core cables.	2	5	4M
			ii) Distinguish between disruptive critical voltage and visual critical voltage. Give expressions for the same.	4	5	8M

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

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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
1		**Unit-I**			
	a	i) Recall the principle of working of a PMMC instrument with neat diagram.	K1	1	7M
		ii) Distinguish control torque and deflecting torque	K2	1	5M
		OR			
	b	i) It is desired to extend the range of a DC milliammeter of the range 0 to 100 mA, to measure up to 1 A. The meter resistance R is 1 kW. Determine the value of shunt to be used and its multiplying power.	K3	1	6M
		ii) Explain the principle of working of a Moving iron instrument with neat diagram	K1	1	6M
2		**Unit-II**			
	a	Draw neat circuit of single phase Dynamometer type Wattmeter and explain the working.Also derive the equation for deflection torque.	K1	2	12M
		OR			
	b	i) Explain with neat diagram Single phase induction type energy meter and discuss its errors.	K1	2	9M
		ii) Outline about phantom loading	K2	2	3M
3		**Unit-III**			
	a	i) Construct power factor meter with diagram and explain the working principle	K3	3	8M
		ii) Illustrate how the Resistance and current can be measured using a D.C Potentiometer.	K3	3	4M
		OR			
	b	i) Determine an unknown resistance and Derive the balance conditions with Wheatstone's bridge and State its limitations.	K3	3	6M
		ii) Determine the unknown resistance and derive the balance conditions with kelvin's double bridge and state its limitations	K3	3	6M
4		**Unit-IV**			
	a	i) Determine the value of inductance using maxwell's inductance bridge	K3	4	6M
		ii) An ac bridge was made up as follows: arm ab, a capacitor of 0.8 mF in parallel with 1 kW resistance, bc a resistance of 3 kW, arm cd an unknown capacitor Cx and Rx in series, arm da a capacitance of 0.4 mF. The supply at 1 kHz is connected across bd and a detector across ac. Determine the value of unknown capacitance Cx, unknown series resistance Rx and dissipation factor	K3	4	6M
		OR			
	b	i) Experiment the measurement of capacitance with Schering Bridge	K3	4	4M
		ii) Explain Megger for the measurement of high resistance with diagram and explain its advantages.	K1	4	8M
5		**Unit-V**			
	a	i) Define Transducer and classify	K1	5	6M
		ii) Compare and contrast Inductive and Capacitive transducers	K3	5	6M
		OR			
	b	i) Illustrate the principle and working of LVDT with neat diagram	K3	5	8M
		ii) what is strain gauge and explain the applications	K1	5	4M

III B.Tech I Semester Regular Examinations, February-2022

Sub Code: 19BEE5PE05 **SPECIAL ELECTRICAL MACHINES**

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) Compare the open loop control and closed loop control of stepper motors.	4	1	6M
		ii) With neat diagrams, explain in detail the constructional details of a stepper motor.	2	1	6M
		OR			
	b	i) Discuss the theory of torque production in stepper motors.	2	1	6M
		ii) List and explain different types of stepper motors with applications.	2	1	6M
		Unit-II			
2	a	Draw the constructional details of an SRM and explain its operating principle. Also list various applications of SRM.	4	2	12M
		OR			
	b	i) With the help of a neat schematic diagram, explain the closed loop control of an SRM.	4	2	6M
		ii) What is the need for position sensor in SRM control? Explain.	2	2	6M
		Unit-III			
3	a	i) Explain the working principle of a PMDC motor and derive its torque equation.	2	3	6M
		ii) Compare between sensor less control and sensor-based control of BLDC motors.	4	3	6M
		OR			
	b	i) What are the advantages and disadvantages of permanent magnet machines? Mention the applications of PM DC motors.	2	3	6M
		ii) Explain the constructional details of a PM BLDC motor.	4	3	6M
		Unit-IV			
4	a	i) Explain the working principle of permanent magnet synchronous motors.	2	4	6M
		ii) Derive the EMF and Torque equations for permanent magnet synchronous motor.	2	4	6M
		OR			
	b	i) Differentiate between permanent magnet synchronous motor and permanent magnet BLDC motor. Also list few applications of permanent magnet synchronous motors.	4	4	6M

1

			KL	CO	M
		ii) Explain the Torque-Speed characteristics of permanent magnet synchronous motor.	3	4	6M
5		**Unit-V**			
	a	i) With neat diagram, explain the constructional details of linear induction motor.	4	5	6M
		ii) What are the advantages and disadvantages of Repulsion motor and also list few applications.	2	5	6M
		OR			
	b	i) Explain the working principle and characteristics of Hysteresis motor.	2	5	6M
		ii) What are the advantages and disadvantages of using linear induction motor for electric traction?	2	5	6M

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

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2

Sub Code: 19BCC5OE03   NON-CONVENTIONAL ENERGY RESOURCES

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) Summarize energy sources and their availability.	K2	CO1	6M
		ii) Explain briefly solar radiation at the earth's surface.	K2	CO1	6M
		OR			
	b	i)What are the instruments for meaning solar radiation and explain briefly.	K1	CO1	6M
		ii) Develop the expression for solar radiation tilted surface.	K3	CO1	6M
		Unit-II			
2	a	i) Demonstrate the factors affecting distribution theof wind energy on the surface of the earth.	K2	CO2	6M
		ii) A HAWT installed at a location having free wind velocity of 15 m/s. The 80-m diameter rotor has three blades attached to the hub. Find the rotational speed of the turbine for optimal energy extraction.	K2	CO2	6M
		OR			
	b	Show the diagram of HAWT and explain the function of its main components.	K2	CO2	12M
		Unit-III			
3	a	i) List out the advantages and disadvantages of geothermal energy.	K1	CO3	6M
		ii) Anlayze the OTEC dry rock resource.	K3	CO3	6M
		OR			
	b	i) Explain the analysis of hot aquifer.	K2	CO3	6M
		ii) Discuss about open cycle and closed cycle operation of ocean thermal energy conversion.	K3	CO3	6M
		Unit-IV			
4	a	i) Demonstrate a seebeck, peltier and Thomson effects of thermoelectric power generation.	K2	CO4	6M
		ii) With a neat sketch explain thermoelectric power generator	K2	CO4	6M
		OR			
	b	Explain thermoelectric materials and discuss briefly selection of materials.	K2	CO4	12M
		Unit-V			
5	a	Explain the operation of open cycle and closed cycle system MHD systems.	K2	CO5	12M
		OR			
	b	ii) Analyze the basic principle of MHD generation and equivalent circuit.	K4	CO5	6M
		ii) List out the main advantages and limitations of MHD systems.	K1	CO5	6M

NARASARAOPETA
ENGINEERING COLLEGE
(AUTONOMOUS)

NEC

III B.Tech I Semester Regular Examinations, February-2022

Sub Code: 19BME5TH02   BUSINESS MANAGEMENT CONCEPTS FOR ENGINEERS
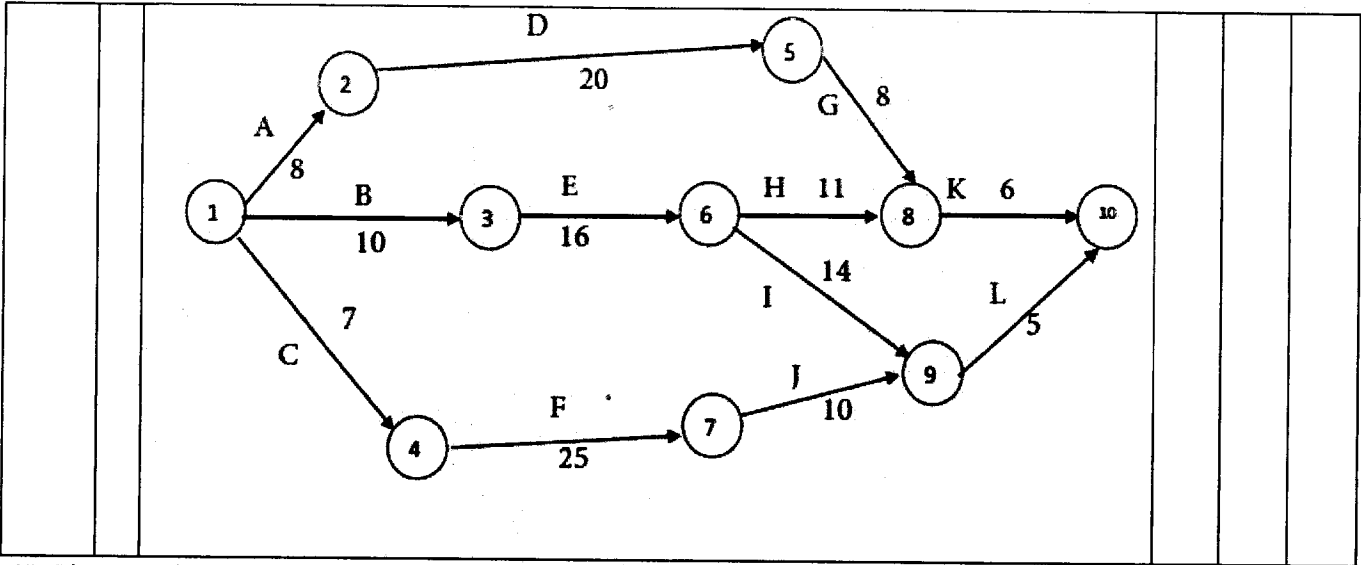
Time: 3 hours   (ME)   Max. Marks: 60

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) Define Managerial Economics. Explain the nature and scope of ME.	K1	1	6M
		ii) Discuss the Law of Demand along with exceptions.	K2	1	6M
		OR			
	b	i) Explain elasticity of demand with examples.	K2	1	6M
		ii) Describe CVP analysis with pros and cons	K3	1	6M
		Unit-II			
2	a	Define the term Market. Compare monopoly and monopolistic markets with examples	k1	2	12M
		OR			
	b	i)Differentiate account and accounting	K3	2	6M
		ii)Discuss the process of journal entry system with necessary information	K2	2	6M
		Unit-III			
3	a	i) Explain various functions of management	K2	3	6M
		ii) Explain the importance of Espirit de corps	K2	3	6M
		OR			
	b	i) Explain scientific management theory	K2	3	6M
		ii) Explain theory X and theory Y	K2	3	6M
		Unit-IV			
4	a	i) Explain the statement Human resources are assets to the organisation.	K2	4	6M
		ii) Differentiate marketing from sales	K3	4	6M
		OR			
	b	i) Explain 'reduction of cost on every year is mere mandatory even inflation improves.	K2	4	6M
		ii) Discuss the important functions of a finance manager	K2	4	6M
5		**Unit-V**			
	a	i) Explain the terminology of project management	K2	5	6M
		ii) Discuss the basis for a network diagram	K2	5	6M
		OR			
	b	i) Define PERT and CPM. Explain the usage of PERT	K1	5	6M
		ii) Find out the completion time and the critical activities for the following project:	k2	5	6M

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

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2

III B.Tech I Semester Regular Examinations, February-2022

Sub Code: 19BME5TH03   METAL CUTTING AND MACHINE TOOLS

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)	Describe the chip formation in metal cutting and mention the types of chips and the conditions in which they are formed.	K2	1	6M
		ii)	Describe the factors influencing the tool life during metal cutting process.	K2	1	6M
			OR			
	b	i)	Draw the single point cutting tool nomenclature and mention its parts.	K2	1	6M
		ii)	Explain the different types of cutting tool materials used in metal cutting.	K2	1	6M
			Unit-II			
2	a		Explain the functioning of the following lathe parts in detail head stock, carriage, tail stock, bed, four jaw chuck with neat sketches.	K2	2	12M
			OR			
	b	i)	Describe the specifications of lathe machine with neat sketches.	K2	2	6M
		ii)	Differentiate between the Capstan lathe and the Turret lathe.	K2	2	6M
			Unit-III			
3	a	i)	Briefly explain the difference between the plain, semi-universal and universal radial drilling machine.	K2	3	6M
		ii)	What is a quick return mechanism? Describe the crank and slotted link mechanism in a shaper.	K2	3	6M
			OR			
	b	i)	Describe the parts and functioning of the double housing planar.	K2	3	6M
		ii)	Briefly discuss about the working and applications of jig boring machine.	K2	3	6M
			Unit-IV			
	a	i)	Explain the parts and functioning of column and knee type milling machine.	K3	5	6M

			KL	CO	Marks
		ii) Briefly elaborate about the up milling and down milling process.	K3	5	6M
		OR			
	b	i) Describe the profile milling, metal slitting, straddle milling, T-slot cutting and woodruff key cutting.	K3	5	6M
4		ii) Briefly discuss about the different types of jigs with neat sketches.	K3	5	6M
		Unit-V			
	a	i) Explain about the center-less cylindrical grinding process with a neat sketch.	K3	4	6M
5		ii) Explain about the grit, grade and structure of a grinding wheel.	K3	4	6M
		OR			
	b	i) Explain about the dressing and truing of a grinding wheel.	K3	4	6M
		ii) Describe the process of Honing and its applications.	K3	4	6M

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

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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) In a single heater regenerative cycle steam enters the turbine at 30 bar and 400°C and the exhaust pressure is 0.01 bar. The feed water heater is a direct contact type which operates at 5 bar. Find the efficiency and steam rate, the increase in mean temperature of heat addition, efficiency, and steam rate as compared to Rankine cycle without regeneration. Neglect pump work.	K3	CO1	8M
			ii) What is a Vapour Power Cycle? Can a Carnot cycle be used for a steam power plant? Mention the reasons to justify your answer.	K3	CO1	4M
			OR			
		b	i) Illustrate the working of Orsat's flue gas analyzer apparatus.	K2	CO1	6M
			ii) In a steam power cycle, the steam supply is at 15 bar and dry and saturated. The condenser pressure is 0.4 bar. Calculate the Carnot and Rankine efficiencies of the cycle. Neglect pump work.	K3	CO1	6M
			Unit-II			
2		a	With neat sketches describe various accessories normally used in a steam generating plant.	K2	CO2	12M
			OR			
		b	i) Explain the working of various types of draughts used in usual practice.	K2	CO2	6M
			ii) What are the advantages of artificial draught over natural draught?	K2	CO2	6M
			Unit-III			
3		a	i) Derive the expression for critical pressure ratio in a flow through a nozzle.	K3	CO3	6M
			ii) Steam enters a group of nozzles of a steam turbine at 12 bar and 220°C and leaves at 1.2 bar. The steam turbine develops 220 kW with a specific steam consumption of 13.5 kg/kWh. If the diameter of nozzles at throat is 7 mm, then calculate the number of nozzles.	K3	CO3	6M
			OR			
		b	i) Derive the expression for maximum discharge for a flow through a Nozzle	K3	CO3	6M
			ii) In a steam nozzle, the steam expands from 4 bar to 1 bar. The initial velocity is 60 m/s and the initial temperature is 200°C. Determine the exit velocity if the nozzle efficiency is 92%.	K3	CO3	6M
			Unit-IV			
4		a	Derive the condition for optimum blade speed ratio for a single stage impulse turbine and find the maximum blade (diagram) efficiency.	K3	CO4	12M
			OR			
		b	Illustrate the methos of compounding an impulse turbine and discuss their merits and demerits.	K3	CO4	12M
5						

		Unit-V			
	a	i) With the help of a T-s diagram briefly explain the process of inter cooled gas turbine cycle.	K3	CO5	4M
		ii) In gas turbine plant, working on Brayton cycle with a regenerator of 75% effectiveness, the air at the inlet to the compressor is at 1 bar and 30°C. The pressure ratio is 6 and the maximum cycle temperature is 900°C. If the turbine and compressor have each an efficiency of 80%, find the percentage increase in the cycle efficiency due to regeneration.	K3	CO5	8M
		OR			
	b	Illustrate the working of Solid, liquid and hybrid propulsion rockets and write their applications.	K3	CO5	12M

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

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III B.Tech I Semester Regular Examinations, February-2022

Sub Code: 19BME5TH05   DESIGN OF MACHINE ELEMENTS -I

Time: 3 hours   (ME)   Max. Marks: 60

Note: Answer All **FIVE** Questions.

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

Design data book required for solving the problems.

Q.No			Questions	KL	CO	M
			Unit-I			
	a		i)List the Steps involved in general design procedure?	K3	CO1	6M
			Define Resilience? How it is different from toughness?	K1	CO1	6M
			OR			
1	b		i)Explain about theories of failures under static load?	K2	CO1	6M

			ii)The load on a bolt consists of an axial pull of 10kN together with a transverse shear force of 5kN. Find the diameter of bolt required according to
			  i. Maximum principal stress theory;
			  ii. Maximum shear stress theory;
			  iii. Maximum principal strain theory;
			  iv. Maximum strain energy theory; and
			  v. Maximum distortion energy theory. •
			Take permissible tensile stress at elastic limit= 100MPa and Poisson's ratio=0.3.
				K3	CO1	6M

			Unit-II			
2	a		A hot rolled steel shaft is subjected to a torsional moment that varies from330 N-m clockwise to 110 N-m counterclockwise and an applied bending moment at a critical sectionvaries from 440 N-m to – 220 N-m. The shaft is of uniform cross-section and no keyway is present atthe critical section. Determine the required shaft diameter. The material has an ultimate strength of550 MN/m^2 and yield strength of 410 MN/m^2. Take the endurance limit as half the ultimate strength,factor of safety of 2, size factor of 0.85 and a surface finish factor of 0.62.	K5	CO2	12M
			OR			
	b		i)Explain about Goodman method for combination of stresses?	K4	CO2	6M
			A 50 mm diameter shaft is made from carbon steel having ultimate tensile strength of 630MPa. It is subjected to a torque which fluctuates between 2000 Nm to –800 Nm. Using Soderberg method, calculate the factor of safety. Assume suitable values for any other data needed.	K5	CO2	6M
3			**Unit-III**			
	a		A plate of 100 mm wide and 12.5 mm thick is to be welded to another plate bymeans of parallel fillet welds. The plates are subjected to a load of 50kN. Determine the length of the weldso that the maximum stress does not exceed 56MPa. Consider the joint first under static loading andthen under	K5	CO3	12M

		fatigue loading.			
		OR			
	b	A double riveted lap joint is made between 15 mm thick plates. The rivet diameter and pitch are 25 mm and 75 mm respectively. If the ultimate stresses are 400 MPa in tension, 320 MPa in shear and 640 MPa in crushing, find the minimum force per pitch which will rupture the joint. If the above joint is subjected to a load such that the factor of safety is 4, find out the actual stresses developed in the plates and the rivets.	K5	CO 3	12M
		Unit-IV			
4	a	Design a typical cotter joint to transmit a load of 50 kN in tension or compression. Consider that the rod, socket and cotter are all made of a material with the following allowable stresses: Allowable tensile stress (σy)= 150 MPa, Allowable crushing stress (σc) = 110 MPa, Allowable shear stress (τy) = 110 MPa.	K4	CO 4	12M
		OR			
	b	i) Explain about various types of keys.	K2	CO 4	6M
		ii) What are the design considerations of keys?	K1	CO 4	6M
		Unit-V			
5	a	Design an auto mobile transmission shaft which is required to transmit 45kW at 500rpm. The outside diameter must not exceed 50mm and maximum shear stress should not exceed 84MPa. Compare the weight of the solid and hollow shafts which would just meet their requirements.	K5	CO 5	12M
		OR			
		i)Write the design procedure for flange coupling with neat sketch?	K2	CO 5	6M
	b	ii)Design a clamp coupling to transmit 30 kW at 100r.p.m. The allowable shear stress for the shaft and key is 40MPa and the number of bolts connecting the two halves are six. The permissible tensile stress for the bolts is 70MPa. The coefficient of friction between the muff and the shaft surface may be taken as 0.3.	K4	CO 5	6M

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

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III B.Tech I Semester Regular Examinations, February-2022

Sub Code: 19BCC5OE10

OOPS THROUGH JAVA

(ME)

Time: 3 hours

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) Briefly explain about Java Virtual Machine?	4	1	6M
		ii) What are the Principles of Object-Oriented Languages? Explain.	1	1	6M
		OR			
	b	i) Explain the procedure for Execution of Java Program?	4	1	6M
		ii) What are the applications of OOP?	1	1	6M
		Unit-II			
2	a	i) Describe about different data types?	3	2	12M
		ii) Explain the syntax of 'for' loop with an example?	4	2	
		OR			
	b	i)Write a short note on ternary operator?	2	2	6M
		ii) Explain the syntax of 'while' loop with an example?	4	2	6M
		Unit-III			
3	a	i) Explain the usage of 'super' keyword?	3	3	6M
		ii) Write a short note on Interface?	2	3	6M
		OR			
	b	i) Explain the usage of 'final' keyword?	3	3	6M
		ii) Explain the process of defining and creating a package with example?	4	3	6M
		Unit-IV			
4	a	i) Explain the concept of Exception handling?	4	3	6M
		ii) Write a short note on Flow Layout and Border Layout?	2	4	6M
		OR			
	b	i) What is meant by user defined exception? Explain.	1	3	6M
		ii) Write a short note on Text field and Text area?	2	4	6M
		Unit-V			
5	a	i) Write a short note on Adapter classes?	2	4	6M
		ii) Write a program to create a frame window that responds to mouse clicks?	5	4	6M
		OR			
	b	i) Write a short note on Inner classes?	2	4	6M
		ii) Write a program to create a frame window that responds to Key Strokes?	5	4	6M

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

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1

Q.No		Questions	KL	CO	M
1		Unit-I			
	a	i) Explain any one of the frequency compensation technique in connection with Op-amp.	KL2	1	6M
		ii) An IC op-amp 741 used as an inverting amplifier with a gain of 100. The voltage gain vs frequency characteristic is flat up to 12 kHz. Find the maximum peak to peak input signal that can be feed without causing any distortion to the output.	KL3	1	6M
		OR			
	b	i) Compare and contrast an ideal Op-amp and practical Op-amp.	KL3	1	6M
		ii) Explain the working of Non-inverting amplifier and derive the equation of its Gain.	KL2	1	6M
2		Unit-II			
	a	i) Which is the fastest ADC? Explain the operation and discuss its merits and de-merits.	KL3	2	6M
		ii) Design a 4-bit weighted resistor DAC whose full-scale output voltage is 10Volts. Assume R_f = 10KΩ and logic '1' level as + 5volts and logic '0' level as 0volts. What is the output voltage when the input is 1101?	KL3	2	6M
		OR			
	b	i) Explain the operation of a multiplying DAC and mention its applications.	KL2	2	6M
		ii) What is the conversion time of a 10-bit successive approximation ADC if its input clock is 10 MHz?	KL3	2	6M
3		Unit-III			
	a	i) Draw the first order low-pass Butterworth filter and	KL1	3	6M

			analyze the same by deriving the gain and phase angle equation.			
		ii)	An ideal low pass filter having f_H = 5kHz is cascaded with high pass filter having f_L = 4.8kHz. Sketch the frequency response of the cascaded filter.	KL3	3	6M
			OR			
	b	i)	Draw the functional block diagram of IC 565 and explain its working	KL1	3	6M
		ii)	Design a narrow band bandpass filter using op-amp. The resonant frequency is 100HZ and Q = 2. Assume c = 0.1μf.	KL3	3	6M
4			Unit-IV			
	a	i)	Explain noise margin and propagation delay with respect to CMOS logic.	KL1	4	6M
		ii)	Explain sinking current and sourcing current of TTL output. Which of the above parameters decide the fan-out and how?	KL2	4	6M
			OR			
	b	i)	With neat sketch explain the operation of TTL NAND gate.	KL1	4	6M
		ii)	Distinguish between static and dynamic power dissipation of a CMOS circuit?	KL3	4	6M
5			Unit-V			
	a	i)	Write short notes on parity generator and checker?	KL1	5	6M
		ii)	Implement the following Boolean expression using 74×151 IC F = AB + BC + AC.	KL3	5	6M
			OR			
	b	i)	Design a 5-to-32-line decoder using 3-to-8-line decoder, active low outputs with 2 active low and one active high enable.	KL3	5	6M
		ii)	Design an 8:1 multiplexer using two 4:1 multiplexer? Write the truth table and draw the logic diagram?	KL2	5	6M

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

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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 the response of High-pass RC circuit for square wave input	K5	1	6M
			ii) A pulse is applied to low-pass RC circuit. Prove that area under the pulse is same as area under the output waveform across the capacitor	K5	1	6M
			OR			
	b		i) Explain the response of Low-pass RC circuit for exponential input	K5	1	6M
			ii) When does high pass circuit act as a differentiator?	K5	1	6M
			Unit-II			
2	a		i) Draw the circuit of transistor clipper and explain its operation	K2	2	6M
			ii) Design a diode clamper to restore a dc level of +5 V to an input signal of peak to-peak value 15 V. Assume the drop across the diode is 0.7 V and the signal frequency is 1 kHz	K2	2	6M
			OR			
	b		i) Draw the basic circuit of diode clipper and explain its operation with the help of transfer characteristics	K3	2	6M
			ii) Draw the circuit diagram of emitter coupled clipper and explain its operation	K3	2	6M
			Unit-III			
3	a		i) Discuss about breakdown voltages of a transistor	K4	3	6M
			ii) Explain about design of transistor switch	K4	3	6M
			OR			
	b		i) write short notes on Emitter coupled Logic families in detail	K3	3	6M
			ii)List out few comparisons of TTL and CMOS Logic Families	K3	3	6M
			Unit-IV			
4	a		i) Explain how an astable multivibrator can be used as a voltage to frequency convertor	K3	4	6M
			ii) Design an astable multivibrator to generate a square wave of 1 kHz	K3	4	6M
			OR			
	b		i) Derive the expression for gate width of a monostable multivibrator neglecting the reverse saturation current I_{CBO}.	K4	4	6M
			ii) Explain the operation of Schmitt trigger along with circuit diagram	K4	4	6M
			Unit-V			
5	a		i) Explain the basic principle behind sampling gate	K5	5	6M
			ii) Explain the basic principles behind miller time base generator	K5	5	6M
			OR			
	b		i) What is meant by time base signal? What are the K general features of time base signal? Explain	K2	5	6M
			ii) Explain the operation of four diode sampling gate	K2	5	6M

III B.Tech I Semester Regular Examinations, February-2022

Sub Code: 19BEC5TH04　　　　**CONTROL SYSTEMS**
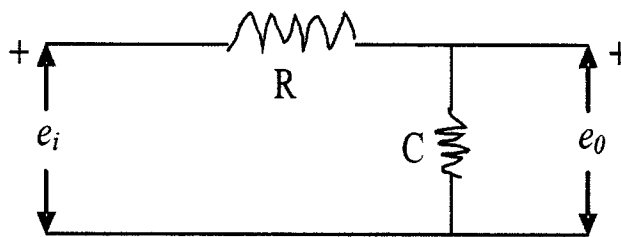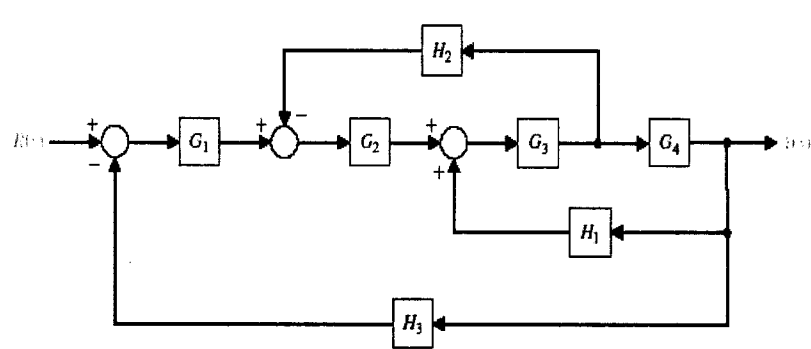
Time: 3 hours　　　　　　　　　　　　(ECE)　　　　　Max. Marks: 60

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) Explain the properties of closed loop system	K1	CO 1	6M
		ii) Develop the transfer function for the electrical system shown in Fig 1-a **Fig:1-a**	K4	CO 1	6M
		OR			
	b	i) Explain the effect of feedback on the noise and sensitivity of the system	K1	CO 1	6M
		ii) Draw the signal flow graph and derive the closed loop transfer function of the system whose block diagram is given in Fig 1-b **Fig:1-b**	K3	CO 1	6M
2		**Unit-II**			
	a	A unity feedback control system is characterized by an open loop transfer function G(s)=K/s(s+10).Determine the gain K so that the system will have a damping ratio of 0.5. For this value of K, determine settling time, peak overshoot, and time to peak overshoot for a unit step input.	K4	CO 2	12M
		OR			
	b	i) Define the terms transient response and steady state response. Explain in detail about different time domain specifications.	K1	CO 2	6M

				KL	CO	M
			ii) A unity feedback system has G(s)=10/s(s+2). Find the generalized error constants and steady state error.	K2	CO 2	6M
3			**Unit-III**			
	a		i) With the help of Routh stability criterion find the stability of the system represented by the characteristic equation $s^5+s^4+2s^3+2s^2+3s+5=0$	K2	CO 3	6M
			ii) Sketch the Root locus of the system whose open loop transfer function is G(s)=K/[s(s+2)(s+4)]	K3	CO 3	6M
			OR			
	b		i) A unity negative feedback control system has an open loop transfer function consisting of two poles, two zeros and a variable gain K. The zeros are located at -2 and -1; and the poles at 0.1 and +1. Using Routh stability criterion, determine the range of values of K for which the system is stable.	K4	CO 3	6M
			ii) Explain the general rules for construction of Root Locus plot.	K1	CO 3	6M
4			**Unit-IV**			
	a		i) Explain the concept of gain margin and phase margin.	K1	CO 4	6M
			ii) Sketch the Nyquist plot and determine the gain margin and phase margin of the given open loop transfer function and comment on its stability. G(s)H(s)= (1+4s)/s²(1+s)(1+2s).	K2	CO 4	6M
			OR			
	b		i) Derive the expressions for the frequency domain specifications of a prototype second order system.	K2	CO 4	6M
			ii) Sketch the magnitude and phase Bode plots of the given system and comment on its stability. G(s)=10/s(s+0.5s)(1+0.05s)	K3	CO 4	6M
5			**Unit-V**			
	a		i) Write the basis for selection of a particular compensation.	K1	CO 5	6M
			ii) With physical example explain the concepts of controllability and observability.	K2	CO 5	6M
			OR			
	b		i) Explain the procedure for design of a Lag compensator in frequency domain.	K2	CO 5	6M
			ii) Explain various methods of evaluation of state transition matrix.	K1	CO 5	6M

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

III B.Tech I Semester Regular Examinations, February-2022

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) Explain the concept of basic Bus Structures of Computer system along with diagrams	K1	1	6M
		ii) write short notes on RISC processor	K1	1	6M
		OR			
	b	i) List out different Functional units of computer system and explain	K3	1	6M
		ii) write short notes on CISC processor	K3	1	6M
		Unit-II			
2	a	i) Explain the Address Translation in Virtual Memory	K2	2	6M
		ii) Write short notes on Direct memory Access in detail	K2	2	6M
		OR			
	b	i) Explain the concept of Cache memory organization in detail	K3	2	6M
		ii) write short notes on Asynchronous data transfer with example	K3	2	6M
		Unit-III			
3	a	i) With the help of functional diagram explain the operation of 8086 microprocessor	K5	3	6M
		ii) What is meant by an addressing mode? Explain the different addressing modes supported by 8086 with suitable examples	K5	3	6M
		OR			
	b	i) Draw the Register organisation of 8086 microprocessor and explain its operation	K2	3	6M
		ii) Explain the logical rotate instructions of 8086 with examples.	K2	3	6M
		Unit-IV			
4	a	i) Explain the minimum mode operation of 8086 with the help of a PIN diagram	K3	4	6M
		ii) Develop an assembly language program to multiply two BCD numbers of 2-digits each.	K3	4	6M
		OR			
	b	i) Draw the timing diagram for the memory write cycle operation in the minimum mode of 8086 processor	K1	4	6M
		ii) write short notes on Pentium processor	K1	4	6M
		Unit-V			
5	a	i) Draw the internal block diagram of 8255 PPI and explain its operation	K3	5	6M
		ii) Describe the important features of 8257 DMA.	K3	5	6M
		OR			
	b	i) Discuss about the operational command words of 8259 and draw its frame format	K4	5	6M
		ii) write short notes on 8251 USART	K4	5	6M

III B.Tech I Semester Regular Examinations, February-2022

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
1			**Unit-I**			
	a		i) Draw the setup diagram of crystal microphone and explain the working	K1	1	6M
			ii) Draw the setup diagram of Dynamic Headphones and explain the working	K1	1	6M
			OR			
	b		i)With the help of block diagram explain the working of handset of cordless phone	K3	1	6M
			ii)Explain the need of Baffles	K2	1	6M
2			**Unit-II**			
	a		Explain in detail about Sound Reflection, Sound Refraction	K2	2	12 M
			OR			
	b		i) With the help of block diagram explain the working of Hi-fi system	K3	2	6M
			ii)Explain in detail about Video reproduction using magnetic tape	K2	2	6M
3			**Unit-III**			
	a		i) Describe the Elements of a Television System	K3	3	6M
			ii) Explain in detail about Monochrome TV camera	K2	3	6M
			OR			
	b		i) Explain three Color theories of Color TV	K2	3	6M
			ii) Explain in detail about Monochrome Picture tubes.	K2	3	6M
4			**Unit-IV**			
	a		i) Discuss the Common Operating controls of Monochrome TV receiver.	K2	4	6M
			ii) Write short notes on Digital TV System.	K1	4	6M
			OR			
	b		i) Write short notes on Remote controls	K1	4	6M
			ii) Explain in detail about Common service controls of Color TV receivers	K2	4	6M
5			**Unit-V**			
	a		i) Draw the setup diagram of Microwave oven and explain its working of Microwave oven	K1	5	6M
			ii) Write a short note on Xerography	K1	5	6M
			OR			
	b		i) Explain the working of digital clock	K2	5	6M
			ii) Write a short note on Washing Machine	K1	5	6M

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

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III B.Tech I Semester Regular Examinations, February-2022

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) Write about OSI reference model with critical review.	2	2	6M
			ii) What are the key features of Novel Netware?	2	1	6M
			OR			
	b		i) Explain features of TCP/IP reference model.	4	2	6M
			ii) Compare LAN and WAN.	4	1	6M
			Unit-II			
2	a		Present design issues of Data Link layer.	2	3	12M
			OR			
	b		i)Illustrate with example use of Parity bit in error detection.	4	3	6M
			ii) Illustrate with example use of Hamming code in error detection and correction.	4	3	6M
			Unit-III			
3	a		i) Explain sender and receiver modules of simplex stop and wait protocol.	4	3	6M
			ii) Discuss about CSAM/CD protocol for collision less carrier transmission.	2	3	6M
			OR			
	b		Discuss features of any two sliding window protocols.	2	3	12M
			Unit-IV			
4	a		i)Illustrate with example shortest path routing algorithm.	4	4	6M
			ii) Compare and contrast Connection Oriented and Connection Less Services.	4	4	6M
			OR			
	b		i) Illustrate with example Distance Vector Routing algorithm.	4	4	6M
			ii) Discuss IP Address formats.	2	4	6M
			Unit-V			
5	a		i) What are the service primitives of simple transport layer?	2	5	6M
			ii) Explain the features of TCP protocol.	4	5	6M
			OR			
	b		i) Explain the use of DNS in internet web browsing.	4	6	6M
			ii) What is URL? Explain HTTP.	2	6	6M

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

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III B.Tech I Semester Regular Examinations, February-2022

Sub Code: 19BCS5TH04 **OOAD THROUGH UML**
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) What are the building blocks of UML? Explain	2	1	6M
		ii)Explain modeling of relationships in UML with examples	3	1	6M
		OR			
	b	I) Present Software Development Life Cycle in UMLand Explain	3	1	6M
		ii)List out Structural Diagrams and Behavioral diagrams and give their significance in Modeling	3	1	6M
		Unit-II			
2	a	What are the various classifiers of UML? Briefly explain with appropriate representation .	2	2	12M
		OR			
	b	i) Illustrate Modelling of Logical Database Schema	3	2	6M
		ii) Explain Object Diagram with example.	3	2	6M
		Unit-III			
3	a	i) What are the properties of Sequence diagrams? Explain modeling of time ordering of events using a sequence diagram with example.	2	3	6M
		ii) Explain modeling of a context of a system using use case diagram with example.	2	3	6M
		OR			
	b	i) Explain modeling of structural organization of the objects using collaboration diagram with example.	2	3	6M
		ii) Distinguish between Action State and Activity State. Illustrate with erxamples	3	3	6M
		Unit-IV			
4	a	i) What is an event? Explain different types of events used in modeling using UML	2	4	6M
		ii) Explain modeling of concurrent states with example	2	4	6M
		OR			
	b	i)Explain Modeling Flow of Control in UML with example	2	4	6M
		ii) Explain Modeling Timing Constraint in UML with example	2	4	6M
		Unit-V			
5	a	i) Define a component. Demonstrate relation between Components and Classes	3	5	6M
		ii) Explain Modeling of Processors and Devices in UML	3	5	6M
		OR			
	b	i) Draw and explain a component diagram to visualize the static aspect of physical components.	3	5	6M
		ii) Explain modeling of an Embedded system using Deployment diagram in UML	3	5	6M

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

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) Illustrate Lifecycle of a Servlet	K4	1	6M
			ii) Explain how to work with initialization parameters using an example servlet program.	K2	1	6M
			OR			
	b		i) Develop a web application which demonstrates Session Tracking.	K3	1	6M
			ii) Describing the HttpServlet Request & HttpServletResponse interfaces	K1	1	6M
			Unit-II			
2	a		Differentiate Servelts and JSPs and Demonstrate the use of all the three types of scriptlets with example programs.	K2	2	12M
			OR			
	b		i) Explain directive Elements in JSP	K2	2	6M
			ii)Develop JSP application design with MVC	K3	2	6M
			Unit-III			
3	a		i) How to pass data between JSP Pages using session object?	K1	3	6M
			ii) Demonstrate Error Handling and Debugging in JSPs.	K2	3	6M
			OR			
	b		i) How to pass the control between the JSP pages	K1	3	6M
			ii) How to pass the data between the JSP pages	K4	3	6M
			Unit-IV			
4	a		i) Describe how JDBC works and also explain JDBC Architecture	K2	4	6M
			ii) Develop a JSP page to register a student using registration form and student table.	K3	4	6M
			OR			
	b		i) Classify JDBC driver types?	K2	4	6M
			ii) Explain how to access database from JSP page?	K5	4	6M
			Unit-V			
5	a		i) How to create and run a PHP script explain with an example?	K6	5	6M
			ii) List out different types of arrays in PHP	K4	5	6M
			OR			
	b		i) Construct a PHP script to retrieve the data from MySQL database.	K4	6	6M
			ii) Design a PHP code to validate the form consisting of a username, password and email fields.	K6	5	6M

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

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III B.Tech I Semester Regular Examinations, February-2022

Sub Code: 19BCI5TH02

COMPILER DESIGN

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 phases of a complier and show the transformation that takes after each phase in translating the statement: $S=(a+b+c)/2$ Assume that all variables are double.	L2	1	6M
			ii) Write regular expressions & FA for the following informally described languages: a. All strings of a's and b's with the subsequence abb. b. All strings of a's and b's with an even number of a's and an odd number of b's..	L3	1	6M
			OR			
	b		i) Describe the phases of a complier and show the transformation that takes after each phase in translating the statement: $X=25+(b+c/d*e)/(f*g-h*i)$ Assume that all variables are double	L2	1	6M
			ii) Show that following grammar in not LL(1) $S\to iEtSS^1/a$ $S^1\to eS/\varepsilon$ $E\to b$	L3	1	6M
			Unit-II			
2	a		i) Consider two binary operators '$\uparrow\uparrow$' and '$\downarrow$' with the precedence of operator $\downarrow$ being lower than that of the operator $\uparrow\uparrow$. Operator $\uparrow\uparrow$ is right associative while $\downarrow$ is left associative. Then draw the parse tree for the following expression. $(7\downarrow3\uparrow\uparrow4\uparrow\uparrow3\downarrow2)$	L2	2	6M
			ii) Consider the following grammar defined over = {0, 1}. $S\to0S11$ $S\to S1$ $S\to@$ a. Briefly describe the language generated by this grammar. b. Show that this grammar is ambiguous by giving a string that can be parsed in two different ways and showing the two corresponding parse trees. c. Rewrite the grammar to eliminate the ambiguity	L3	2	6M
			OR			
	b		i) Consider the following grammar defined over = {True, False}. BExp->BExp or BExp | BExp and BExp | not BExp | True | False a. Briefly describe the language generated by this grammar. b. Show that this grammar is ambiguous by giving a string that can be parsed in two different ways and showing the two corresponding parse trees. c. Rewrite the grammar to eliminate the ambiguity	L3	2	6M
			ii) Generate LL(1) and SLR(0) Passing table for grammar $E\to TE^1$ $E^1\to +TE^1/\varepsilon$ $T\to FT^1$ $T^1\to *FT^1/\varepsilon$ $F\to(E)/id$	L3	2	6M

			KL	CO	M
		Unit-III			

3	a	**i)** Consider the following grammar. Note that id, +, [,], and "," are terminals. E-> E + T | T T-> id | id[] | id[X] X E-> , E | E
		
		   a. Eliminate left recursion in the grammar.
		   b. Perform left factoring for the grammar.
			L4	3	6M

		ii) Consider the grammar and construct LALR Parsing Table. S' –> S, S –> XX, X –> aX, X –> b	L4	3	6M
		OR			

	b	**i)** Consider the grammar and construct SLR Parsing Table.
		   S → X
		   X → Yb | aa
		   Y → a | bYa
			L4	3	6M

		ii) Consider the grammar and construct CLR (1) Parsing Table.
		   S → Z
		   Z → aMa | bMb | aRb | bRa
		   M → c
		   R → c
			L4	3	6M

		Unit-IV			
4	a	**i)** Describe how three address statements can be represented as records with fields for the operator and operands in compilers.	L2	4	6M
		ii) Write the quadruples ,triples and indirect triples for the expression -(a+b)*(c+d)-(a+b+c)	L3	4	6M
		OR			
	b	**i)** Generate three address code for "if A<B then 1 else 0", using numerical method.	L3	4	6M
		ii) What is a syntax tree? Write syntax directed definition for constructing a syntax tree for an expression. The grammar for an expression is given below E→E+T, E→T, T→T*F, T→F, F→id Construct syntax tree for the expression: a+b*c using above SDD?	L3	4	6M
		Unit-V			
5	a	**i)** Explain peep-hole optimization and loop optimization.	L1	5	12M
		OR			
	b	**i)** Describe dead code elimination, constant folding, and strength reduction.	L1	5	12M

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

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2

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
1			**Unit-I**			
	a		i) Explain how is a data warehouse different from a database? How are they similar?	L1	1	6M
			ii) Discuss whether or not each of the following activities is a data mining task. a. Predicting the outcomes of tossing a (fair) pair of dice. b. Monitoring the heart rate of a patient for abnormalities. c. Monitoring seismic waves for earthquake activities.	L2	1	6M
			OR			
	b		i) With an example, describe different types of Data. Describe various Applications of Mining.	L1	1	6M
			ii) Present an example where data mining is crucial to the success of a business. What data mining functionalities does this business need (e.g., think of the kinds of patterns that could be mined)? Can such patterns be generated alternatively by data query processing or simple statistical analysis?	L3	1	6M
2			**Unit-II**			
	a		i) In real-world data, tuples with missing values for some attributes are a common occurrence. Describe various methods for handling this problem.	L1	2	6M
			ii) Given two objects represented by the tuples (22, 1, 42, 10) and (20, 0, 36, 8): (a) Compute the Euclidean distance between the two objects. (b) Compute the Manhattan distance between the two objects. (c) Compute the Minkowski distance between the two objects, using h = 3. (d) Compute the supremum distance between the two objects.	L4	2	6M
			OR			
	b		i) Explain the various Data pre-processing techniques. How data reduction helps in data pre-processing.	L2	2	6M
			ii) Briefly outline how to compute the dissimilarity between objects described by the following: (a) Nominal attributes (b) Asymmetric binary attributes (c) Numeric attributes (d) Term-frequency vectors	L2	2	6M
3			**Unit-III**			
	a		i) Illustrate three-tier Data Warehouse Architecture and explain various levels in the architecture.	L2	3	6M
			ii) Suppose that a data warehouse consists of the three dimensions time, doctor, and patient, and the two measures count and charge, where charge is the fee that a doctor charges a patient for a visit. a. Enumerate three classes of schemas that are popularly used for modeling data warehouses.	L4	3	6M

			KL	CO	M
		b. Draw a schema diagram for the above data warehouse using one of the schema classes listed in (a).			
		OR			
	b	i) A data warehouse can be modelled by either a star schema or a snowflake schema. Briefly describe the similarities and the differences of the two models, and then analyse their advantages and disadvantages with regard to one another. Give your opinion of which might be more empirically useful and state the reasons behind your answer.	L4	3	6M
		ii) What are the differences between the three main types of data warehouse usage: information processing, analytical processing, and data mining? Discuss the motivation behind OLAP mining (OLAM).	L2	3	6M
4		**Unit-IV**			
	a	i) Why is tree pruning useful in decision tree induction? What is a drawback of using a separate set of tuples to evaluate pruning? Explain.	L2	4	6M
		ii) It is difficult to assess classification accuracy when individual data objects may belong to more than one class at a time. In such cases, comment on what criteria you would use to compare different classifiers modeled after the same data.	L3	4	6M
		OR			
	b	i) Why is naive Bayesian classification called "naive"? Briefly outline the major ideas of naive Bayesian classification.	L2	4	12M
5		**Unit-V**			
	a	i) The Apriori algorithm makes use of prior knowledge of subset support properties. Prove that all nonempty subsets of a frequent itemset must also be frequent.	L3	5	6M
		ii) Use an example to show why the k-means algorithm may not find the global optimum, that is, optimizing the within-cluster variation.	L2	5	6M
		OR			
	b	i) The Apriori algorithm makes use of prior knowledge of subset support properties. Prove that the support of any nonempty subset s' of itemset s must be at least as great as the support of s.	L3	5	6M
		ii) Prove that in DBSCAN, the density-connectedness is an equivalence relation.	L2	5	6M

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

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III B.Tech I Semester Regular Examinations, February-2022

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			
1	a	i) What is the Use of Angular 8 and explain the Architecture of Angular 8?	K2	1	6M
		ii) Explain the Components and Templates of Angular 8.	K2	1	6M
		OR			
	b	i) What do you mean by binding and explain different types of Data bindings.	K3	1	6M
		ii) Explain the elements of directives and explain with example.	K3	1	6M
		Unit-II			
2	a	What is the role of Http Client Programming in Angular 8 and explain with suitable example?	K3	2	12 M
		OR			
	b	i) What do you mean by Form Validation in Angular 8 and explain with simple example?	K3	2	6M
		ii) What is the purpose of CLI Commands in Web Development and explain important commands with example.	K3	2	6M
		Unit-III			
3	a	i) What is the purpose of Node.js and explain feature of Node.js?	K3	3	6M
		ii) Explain different types of Node.js Process Models with neat diagram.	K3	3	6M
		OR			
	b	i) How to create a simple Node.js web server and handle HTTP requests and explain with simple example.	K3	3	6M
		ii) What is NPM and explain the features.	K3	3	6M
		Unit-IV			
4	a	i) Define and Differentiate Node js and Express js.	K3	4	6M
		ii) What is Node.js File System and explain Node.js Flags for Read/Write with simple example?	K3	4	6M
		OR			
	b	i) What is Express.js Web App and What type of web application can build using Express js?	K3	4	6M
		ii) What are the ways of Serving Static Resources in Node.js?	K3	4	6M
		Unit-V			
5	a	i) What is the pupose of MongoDB and Explain Advantages of MongoDB over RDBMS	K3	5	6M
		ii) What is the the relationship of RDBMS terminology with MongoDB?	K2	5	6M
		OR			
	b	i) How does MongoDB connect to database and explain with example?	K3	5	6M
		ii) How do I update a single, multiple and replace document in MongoDB with example?	K3	5	6M

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

DESIGN AND ANALYSIS OF ALGORITHMS

Sub Code: 19BIT5TH03

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) What are the different mathematical notations used for algorithm analysis? Explain them.	2	1	6M
		ii) Give the algorithm for transpose of a matrix of size mxn and determine the time complexity of the algorithm by frequency – count method.	3	1	6M
		OR			
	b	i) Write different pseudo code conventions used to represent an algorithm.	3	1	6M
		ii) What do you mean by performance analysis? Give the algorithm for matrix multiplication and find the time complexity of the algorithm using step–count method.	3	1	6M
		Unit-II			
2	a	Illustrate the tracing of quick sort algorithm for the following set of numbers and find the time complexity of algorithm: 25, 10, 72, 18, 40, 11, 64, 58, 32, 9.	3	2	12M
		OR			
	b	i) Discuss the working strategy of merge sort and illustrate the process of merge sort algorithm for the given data: 43, 32, 22, 78, 63, 57, 91 and 13.	3	2	6M
		ii) Describe binary search in detail and provide time complexity analysis with an example.	3	2	6M
		Unit-III			
3	a	i) Use the greedy algorithm for sequencing unit time jobs with deadlines and profits to generate the solution when n=7, (p1, p2,…p7)=(3, 5, 20, 18, 1, 6, 30), and (d1, d2,…, d7)=(1, 3, 4, 3, 2, 1, 2).	3	3	6M
		ii) What is a Minimum Cost Spanning tree? Explain Kruskal's Minimum cost spanning tree algorithm with a suitable example.	3	3	6M
		OR			
	b	i) Solve the following instance of knapsack problem using greedy method. n=7(objects), m=15, profits are (P1,P2,P3,P4,P5,P6,P7)=(10,5,15,7,6,18,3) and its corresponding weights are (W1,W2,W3,W4,W5,W6,W7) = (2,3,5,7,1,4,1).	3	3	6M
		ii) Discuss the single-source shortest paths algorithm with a suitable example.	3	3	6M
		Unit-IV			
4	a	I) Solve the following instance of 0/1 KNAPSACK problem using Dynamic programming n = 3, (W1, W2, W3) = (2, 3, 4), (P1, P2, P3) = (1, 2, 5), and m = 6.	3	4	6M

			KL	CO	M
		ii) Construct an optimal travelling sales person tour using Dynamic Programming for the given data: 0 10 9 3 5 0 6 2 9 6 0 7 7 3 5 0	3	4	6M
		OR			
	b	i) Write and explain an algorithm to compute the all pairs shortest path using dynamic programming and prove that it is optimal.	3	4	6M
		ii) Design a three stage system with device types D1, D2, D3. The costs are $30, $15, $20 respectively. The cost of the system is to be not more than $105 and the reliability of each device type is 00.9, 0.8 and 0.5 respectively.	3	4	6M
5		**Unit-V**			
	a	i) Explain the Graph–Coloring problem and draw the state space tree for m= 3 colors and n=4 vertices graph. Discuss the time and space complexity.	3	5	6M
		ii) Draw the portion of the state space tree generated by LC branch and bound of knapsack problem for an instance n=4, (P1, P2, P3, P4) = (10, 10, 12, 18), (w1, w2, w3, w4) = (2, 4, 6, 9), and m=15.	3	5	6M
		OR			
	b	i) Find all possible subsets of w that sum to m. Let w={5,7,10,12,15,18,20}and $m=35$ and draw the portion of the state space tree that is generated using backtracking.	3	5	6M
		ii) Explain the Travelling sales person problem using LCBB procedure with the following instance and draw the portion of the state space tree and find an optimal tour. | ∞	20	30	10
15	∞	16	4
3	5	∞	2
19	6	18	∞		3	5	6M

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

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III B.Tech I Semester Regular Examinations, February-2022

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
1			**Unit-I**			
	a		i) Discuss Software Engineering Challenges?	K6	CO1	6M
			ii) Illustrate Software Process Model?	K2	CO1	6M
			OR			
	b		i) Explain Boehm's Spiral Model with a neat diagram.	K2	CO1	6M
			ii) Distinguish between process and methods.	K4	CO1	6M
2			**Unit-II**			
	a		Difference between Functional and Non-Functional requirements?	K4	CO2	12 M
			OR			
	b		i) Explain user requirements in detail.	K2	CO2	6M
			ii) Explain requirement validation.	K2	CO2	6M
3			**Unit-III**			
	a		i) Write short notes on coupling?	K2	CO3	6M
			ii) List and explain the Design Principles?	K5	CO3	6M
			OR			
	b		i) Compare function oriented and object oriented design?	K4	CO3	6M
			ii) What is the purpose of Data Flow diagram? Give an example with neat diagram.	K1	CO3	6M
4			**Unit-IV**			
	a		i) Differentiate between Testing and Debugging?	K4	CO4	6M
			ii) Discuss black box testing in a detailed view?	K6	CO4	6M
			OR			
	b		i) Compare validation testing and system testing?	K4	CO4	6M
			ii) List and explain different types of testing done during the testing phases?	K2	CO4	6M
5			**Unit-V**			
	a		i) List and explain different Effort Estimation Techniques?	K1	CO4	6M
			ii) Explain in detail ISO 9000 quality standards?	K5	CO4	6M
			OR			
	b		i) Write short note on the various estimation techniques?	K2	CO4	6M
			ii) What is COCOMO model? Give the procedure of the Delphi method.	K3	CO4	6M

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

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III B.Tech I Semester Regular Examinations, February-2022

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	C01	6M
		ii) Explain the operations, requirements, components of Network security model.	K4	C02	6M
		OR			
	b	i) Use Caesar cipher with key =15 to encrypt the message "Hello".	K2	C01	6M
		ii) Discuss the various principles involved in private and public key cryptography	K2	C05	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	C03	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	C01	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	C03	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	C04	6M
		ii) How man in middle attack can be performed in Diffie Hellman algorithm	K2	C06	6M
		Unit-IV			
4	a	i) Describe HMAC algorithm. Comment on the security of HMAC.	K2	C04	6M
		ii) Differentiate digital signature from digital certificate.	K2	C05	6M
		OR			
	b	i) Illustrate in detail about the message authentication code and its requirements	K2	C06	6M
		ii) Describe the steps in finding the message digest using SHA-512 algorithm.	K3	C03	6M
		Unit-V			
5	a	i) Write about Kerberos in detail	K2	C01	6M
		ii) Write the methodology involved in computing the keys in SSL/TLS protocol	K3	C03	6M
		OR			
	b	i) Explain about Secure Electronic Transaction(SET) in detail with neat diagram	K2	C01	6M
		ii) What is Firewall? What are the various Types of Firewalls? Explain each firewall purpose	K4	C02	6M