NAKASAKAUPETA NEC ENGINEERING COLLEGE
(AUTONOMOUS)

II B.Tech II Semester Regular & Supple. Examinations, May-2023

Sub Code: R20CC2201   **TECHNICAL AND COMMUNICATIVE ENGLISH-II**

Time: 3 hours   (Common to All)   Max. Marks: 70

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks   (5 X 14 = 70M)

Q.No.		Questions	KL	CO	Marks
		Unit-I			
1	a	i) "I need a vacation; why not take a trip around the world?" Expand the idea and determination of the narrator's words "I want to go around the world!"	3	1	8M

		ii) b) **Give the appropriate verb forms in the following sentences.**
		   i. My teacher -------- (announce) the mid-term exam dates yesterday.
		   ii. The boys --------- (be) playing in the ground now.
		   iii.The train ------(have) left the platform before we reached the station.
		   iv. If you work hard, you ------ (will) get the success.
		   v. One of my friends -------- (be) coming today.
		   vi. The Sun ----- (rise) the east.
			3	4	6M

		OR			
	b	i) Explain the central theme of Nellie Bly's **"A Proposal to Girdle the Earth".**	3	1	8M
		ii) Write a brief description on the most memorable event in your life.	6	2	6M
		Unit-II			
2	a	i) "Mary Smith was my first teacher, and the dearest to my heart I ever had". Elucidate the author's reasons for admiring his teacher.	3	1	8M
		ii) Write a paragraph of in about 200 words on "the need and importance of Communicative English in the Technical Era".	6	2	6M
		OR			
	b	i) Write the short summary of Warren Burtons's "The District School As It Was by One who Went to It".	6	2	8M

		ii) **Fill in the blanks with appropriate articles where necessary**:
		           a. ……..Gold is a precious medal.
		           b. Where are ------songs of spring?
		           c. Honesty is …….best policy.
		           d. --------God is omnipresent.
		           e. Every dark cloud has----- silver lining.
		           f. The more you work, ------more you gain.
			3	3	6M

		Unit-III			
3	a	i) Discuss briefly how to attract new talent, build better leaders, and create a competitive organization from the view point of Jacob Morgan.	3	1	8M
		ii) **Correct the following sentences:** i) They are living in Bangalore since 2020. ii) One of the books are thought-provoking. iii) His parents didn't came to the party. iv) The boy want to go to his hometown. v) The principal and the students is attending the meeting. vi) How much hours is there in a day?	3	3	6M
		OR			
	b	i) Elucidate the writer's views on how to create a competitive organization in the twentieth century.	3	1	8M
		ii) **Fill the blanks with suitable prepositions:**	3	3	6M

		i) He prefers coffee------tea. ii) She speaks English..........French. iii) Smith is suffering---------headache. iv) Sheena met …...... an accident yesterday. v)The visit of the Prime Minister has been advanced -------two days. vi)Temperance in life is conducive ---------health.			

Unit-IV

4	a	i) Explain the substance of the essay H. G. Wells and the Uncertainties of Progress.	3	2	8M
		ii) **Write the Antonyms for the following words.** i) Battle ii) admire iii) Joy iv) Destroy v) Success vi) Conquer	3	4	6M
		OR			
	b	i) Explain the author's ideas on how H.G.Wells it heralded "a new thing in human experience … such a change in human life as to constitute a fresh phase of history".	6	2	8M
		ii) Write a short paragraph in about 250 words on the topic "ScienceVs Humanity".	6	2	6M

Unit-V

5	a	i) Describe the author's multiple identities as someone attached to both the East and West, and she embraces both China and America?	3	1	8M
		ii) Write an essay in about 250 words on the topic "The impact of Indian Cinema on the Youth".	6	2	6M
		OR			
	b	i) Critically appreciate the short autobiographical memoir *Leaves from the Mental Portfolio of a Eurasian*.	3	1	8M

		ii) **Read the following passage and answer the questions that given below.**
		   I rather pride myself on my packing. Packing is one of those many things that I feel I know more about than any other person living. (It surprises me myself, sometimes, how many such things there are). I impressed the fact upon George and Harris and told them that they had better leave the whole matter entirely to me. They fell into the suggestion with a readiness that had something uncanny about it. George put on a pipe and spread himself over the easy chair, and Harris cocked his legs on the table and lit a cigar.
		1. The author here is:
		       (a) joking about his trip
		       (b) happy about his trip
		       (c) sure of himself
		       (d) arrogant
		2. What was the relation of the author with George and Harris?
		       (a) They were strangers to him
		       (b) He was their servant
		       (c) They were his friends
		       (d) They were his distant relatives
		3. The writer offered to
		       (a) Light a pipe
		       (b) Pack on his own
		       (c) Sit on a easy chair
		       (d) Pack for all of them for the trip on his own
			3	3	6M

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II B.Tech II Semester Regular & Supple. Examinations, May-2023
COMPLEX VARIABLES, PROBABILITY AND STATISTICS

Time: 3 Hours   Program: B.Tech.   Max.Marks:70.   Branch:ME & EEE

Note: Answer All **FIVE** Questions.
All Questions Carry Equal Marks (5 X 14 =70M)

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1. A) I) **Prove that** an analytic function with constant real part is constant.

   II) **If** $f(z)$ is a regular function of z, **prove that** $\left(\dfrac{\partial^2}{\partial x^2}+\dfrac{\partial^2}{\partial y^2}\right)|f(z)|^2=4|f'(z)|^2$.

   OR

   B) I) **Determine** the analytic function whose real part is $\dfrac{y}{x^2+y^2}$.

   II) **Verify**, if $f(z)=\dfrac{x\,y^2(x+iy)}{x^2+y^4}$, $z\neq0\,;f(0)=0$ is analytic or not.

2. A) I) **Evaluate** $\displaystyle\int_0^{2+i}(\bar{z})^2\,dz$ along the line $y=\dfrac{x}{2}$.

   II) **Evaluate** $\displaystyle\oint_C \dfrac{\sin\pi z^2+\cos\pi z^2}{(z-1)(z-2)}\,dz$ where C is the circle $|z|=3$ using Cauchy's- Integral formula.

   OR

   B) I) **Evaluate** $\displaystyle\oint_C \dfrac{e^{2z}}{(z+2)(z+4)(z+7)}\,dz$ where C is $|z|=3$ using Cauchy's-Residue theorem.

   II) **Find** the Laurent's expansion of $f(z)=\dfrac{7z-2}{(z+1)z(z-2)}$ in the region $1<|z+1|<3$.

3. A) I) A businessmen goes to hotels X, Y, Z, 20%, 50%, 30% of the time respectively. It is known that 5%, 4%, 8% of the rooms in X, Y, Z hotels have faulty plumbing's. **What** is the probability that businessman's room having faulty plumbing is assigned to hotel Y?

   II) The probability density function of a variable X is

X	0	1	2	3	4	5	6
P(X)	k	3k	5k	7k	9k	11k	13k

   (a) **Find** k (b) **Find** $P(X<4)$ (c) **Find** $P(3<X\leq6)$

   OR

   B) I) Ten coins thrown simultaneously. **Find** the probability of getting at least
   (a) Seven heads (b) Six heads (c) One head

   II) The mean and standard deviation of the marks obtained by 1000 students in an examination are respectively 34.5 and 16.5. Assuming the normality of the distribution, **find** the approximate number of students expected to obtain marks between 30 and 60.

4. A) I) **What** is the size of the smallest sample required to estimate an unknown proportion to within a maximum error of 0.06 with at least 95% confidence.

   II) A random sample of size 100 has a standard deviation of 5. **What** can you say about the maximum error with 95% confidence.

<div align="center">OR</div>

B) I) A random sample of size 81 was taken whose variance is 20.25 and mean in 32, **construct** 98% confidence interval.

II) A professor's feelings about the mean mark in the final examination in "probability" of a large group of students is expressed subjectively by normal distribution with $\mu_0 = 67.2$ and $\sigma_0 = 1.5$

(a) **If** the mean mark lies in the interval $(65.0, 70.0]$ **determine** the prior probability the professor should assign to the mean mark.

(b) **Find** the posterior mean and standard deviation, if the examinations are conducted on a random sample of 40 students yielding mean 74.9 and standard deviation 7.4.

5. A) I) A random sample of 64 students have a mean weight of 70 kgs. **Can** this be regarded as a sample from a population with mean height 56 kgs and standard deviation 25 kgs.

II) In a sample of 1000 people in Karnataka 540 are rice eaters and the rest are wheat eaters. **Can** we assume that both rice and wheat are equally popular in this state at 1% level of significance.

<div align="center">OR</div>

B) I) Two independent samples of 8 and 7 items respectively had the following values.

Sample I	11	11	13	11	15	9	12	14
Sample II	9	11	10	13	9	8	10	-

Is the difference between the means of samples significant?

II) In one sample of 8 observations from a normal population, the sum of the squares of deviations of the sample values from the sample mean is 84.4 and in another sample of 10 observations it was 102.6. **Test** at 5% level whether the populations have the same variance.

NARASARAOPETA ENGINEERING COLLEGE
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II B.Tech II Semester Regular & Supple. Examinations, May-2023

Sub Code: R20CC2203 **DATABASE MANAGEMENT SYSTEMS**

Time: 3 hours (CSE,IT & AI) Max. Marks: 70

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No.		Questions	KL	CO	Marks
		UNIT-I			
1	a	Discuss the functionalities of Database administrator.	2	1	7 M
		Compare and Contrast File systems and DBMS.	3	1	7 M
		OR			
	b	With a neat diagram, explain the structure of Database Management System.	2	1	10 M
		Explain data independence and how does a DBMS support it?	2	1	4 M
		UNIT-II			
2	a	Discuss about generalization and specialization in E-R diagrams.	2	2	7 M
		Construct ER diagram of university data which represents a relation between different entities Courses, students and faculty	4	2	7 M
		OR			
	b	What is Integrity constraint? Explain different constraints with example.	2	2	10 M
		What is a view in DBMS? Explain with example?	2	2	4 M
		UNIT-III			
3	a	What is a Trigger? And what are its three parts? Explain the differences between Triggers and Integrity constraints.	2	3	10 M
		Why we use NULL values in DBMS?	2	3	4 M
		OR			
	b	How would you use the operators IN, EXISTS, UNIQUE, ANY and ALL in writing nested queries? Explain with an example.	2	3	10 M
		Discuss about aggregate functions with example.	2	3	4 M
		UNIT-IV			
4	a	What are the problems caused by redundantly storing information? Explain.	2	4	7 M
		Explain BCNF with example.	2	4	7 M
		OR			
	b	Define Transitive functional dependency? Explain it with an example.	2	4	7 M
		Discuss about Properties of decompositions.	2	4	7 M
		UNIT-V			
5	a	Explain the ACID properties with example.	2	5	7 M
		What is Indexing? Explain the differences among primary, secondary and clustering indexes?	2	5	7 M
		OR			
	b	Explain the Two-Phase Locking protocol and its variants.	2	5	7 M
		Discuss the benefits of using dynamic indexing.	2	5	7 M

II B.Tech II Semester Regular & Supple Examinations, May-2023

Sub Code: R20CC2204   **SOFTWARE ENGINEERING**

Time: 3 hours   (CSE,IT & AI)   Max. Marks: 70

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks   (5 X 14 = 70M)

Q.No		Questions	KL	CO	Marks
		UNIT-I			
1	a	Describe the nature of the software and software process.	K2	CO1	7
		Interpret the goal of requirements analysis phase and Discuss reasons why it is a difficult one.	K4	CO1	7
		OR			
	b	Differentiate system engineering and software engineering	K4	CO1	7
		Examine Evolutionary and Incremental Model.	K4	CO1	7
		UNIT-II			
2	a	Elaborate the principles to be followed in data oriented analysis.	K2	CO2	7
		Discuss in detail requirement engineering process	K2	CO2	7
		OR			
	b	Discuss in detail the Requirement elicitation with an example.	K2	CO2	7
		How class diagram is important in UML? Explain with an example..	K2	CO2	7
		UNIT-III			
3	a	Draw the activity diagram for online shopping cart	K6	CO3	7
		What are state representations? Explain With data modeling concepts.	K2	CO3	7
		OR			
	b	Discuss about structured design methodologies	K2	CO3	14
		UNIT-IV			
4	a	Illustrate various design concepts considered during design	K2	CO4	7
		Compare Analysis Model vs. Object Design model	K4	CO4	7
		OR			
	b	Examine function oriented design	K4	CO4	14
		UNIT-V			
5	a	Explain the testing objectives and its principles.	K2	CO5	7
		Discuss on the various methods encountered in cost estimation.	K3	CO5	7
		OR			
	b	Discuss various types of black-box testing methods.	K2	CO5	7
		Analyze COCOMO model	K4	CO5	7

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II B.Tech II Semester Regular & Supple. Examinations, May-2023

Sub Code: R20CE2202 **ENGINEERING GEOLOGY**

Time: 3 hours (CE) Max. Marks: 70

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No		Questions	KL	CO	Marks
1	a	Write an Importance of geology from Civil Engineering point of view in detail	1	1	8
		Explain the types of weathering	1	1	6
		OR			
	b	Identify and explain Important branches of geology	2	1	14
2	a	With suitable example explain the physical properties of minerals	2	2	8
		Describe the different methods of study of minerals	1	2	6
		OR			
	b	With suitable sketch explain the rock cycle	2	2	8
		Compare and Contrast Sedimentary rocks and Metamorphic rocks	2	2	6
3	a	What is fold? Classify and explain the different types of fold with sketches.	1	3	8
		Explain the anticline and decline with suitable sketches	1	3	6
		OR			
	b	Discuss the Fundamental aspects of rock mechanics and environmental geology.	2	3	14
4	a	Illustrate the causes and effects of earthquake in detail	2	4	8
		Explain precautions to be taken for building construction in seismic areas	2	4	6
		OR			
	b	Describe the following methods with neat sketch. 1. Magnetic methods 2. Electrical resistivity methods	2	4	14
5	a	Enumerate Geological Considerations in the selection of a dam site	3	5	7
		List and explain Geological factors influencing water Lightness and life of reservoirs	3	5	7
		OR			
	b	Explain Purposes of tunneling	1	5	7
		Explain the Role of Geological Considerations in tunneling	1	5	7

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II B.Tech II Semester Regular & Supple Examinations, May-2023

Sub Code: R20CE2203

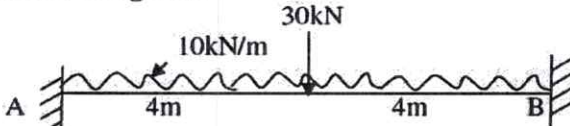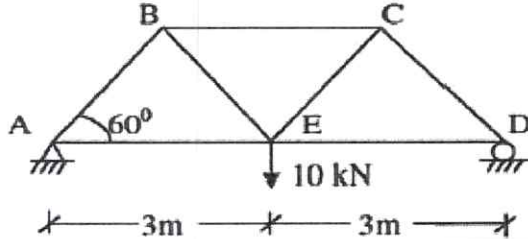**STRUCTURAL ANALYSIS**

Time: 3 hours   (CE)   Max. Marks: 70
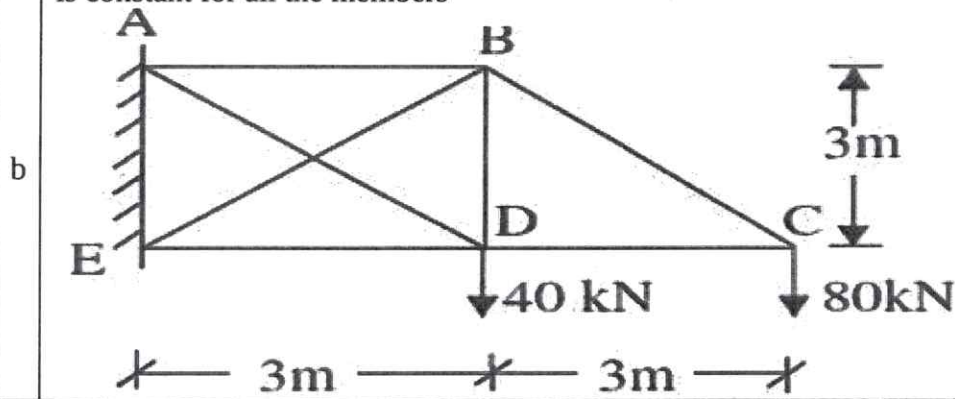
Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks   (5 X 14 = 70M)

Q.No		Questions	KL	CO	Marks
		UNIT-I			
	a	State the difference between Degree of Static and Kinematic indeterminacy of Beams	1	1	4
		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	4	1	10
1		**OR**			
	b	A fixed beam is shown in below Figure. Solve the beam and also draw the BM and SF Diagrams	4	1	10
		Write about deflection of fixed beams	1	1	4
		UNIT-II			
2	a	A continuous beam ABC consists of spans AB and BC of lengths 4m and 6m respectively, the ends A and B being fixed. C is a free end. The span AB carries a uniformly distributed load of 24 kN/m while the span BC carries a point load of 108 kN at a distance of 2m from C. Find the support moments and support reactions	4	2	9
		State the assumptions made in slope-deflection method? Write down the slope deflection equation for a fixed end support.	1	2	5
		OR			
	b	A continuous beam ABC consists of two spans AB of length 4m, and BC of length 3m.The span AB carries a point load of 100 KN at its middle points. The span BC carries a point load of 120 KN at 1m from C. The end A is fixed and the end C is simply supported. Find i) The moments at the supports ii) The reactions at the supports and iii) Draw the B.M diagram. Use Clapeyron's theorem of three moments	4	2	14
		UNIT-III			
3	a	Determine the vertical deflection of Joint 'C' for the truss shown in below Figure. Take A=500x10-6m2, E=200x106kN/m2 are constant for all members. Use strain energy method.	4	3	14

	b	Find the force in the member BE of the frame shown in below Figure. Take AE is constant for all the members	4	3	14

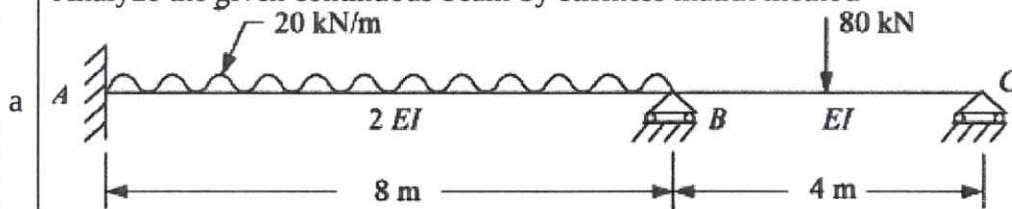|					
4	a	Draw the Influence line diagram for reactions of a simply supported beam of 12 m span carries a UDL of 20kN/m. Also draw the influence line diagrams for Shear force and bending moments at quarter span and mid-span sections and calculate the values.	4	4	14

OR

	b	Draw the influence line diagram for B.M at a point 8m from the left abutment on a bridge girder of span 30m and find the maximum B.M at that point due to a series of wheel loads 80kN, 160kN, 160kN and 160kN at centre to centre distances of 4m, 2.5m, 2.5m and 2.5m respectively. The loads can cross in either directions with the 80kN load leading.	4	4	14

5	a	Analyze the given continuous beam by stiffness matrix method	4	5	14

OR

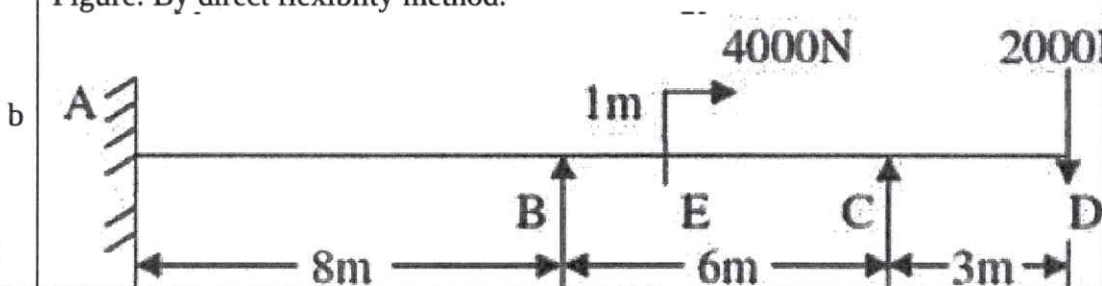|					
	b	A continuous beam of constant moment of Inertia is loaded as shown in below Figure. By direct flexiblity method.	4	5	14

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II B.Tech II Semester Regular & Supple Examinations, May-2023

Sub Code: R20CE2204   **STRENGTH OF MATERIALS-II**

Time: 3 hours   (CE)   Max. Marks: 70

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks   (5 X 14 = 70M)

Q.No		Questions	KL	CO	Marks
		UNIT-I			
1	a	An element in a stressed material has tensile stress of 500MN/m² and a compressive stress of 350MN/m² acting on two mutually perpendicular planes and equal shear stress of 100MN/m² on these planes. Find principal stresses and position of the principal planes. Find also maximum shearing stress	K3	CO1	7M
		In a two dimensional stress system the normal stresses on two planes at right to one another are 150MPa (tensile) and 50MPa (compressive). The magnitude of the maximum shear stress at the point is 150MPa. Determine the largest principal stress at the point	K3	CO1	7M
		OR			
	b	At a point in a stressed element, the normal stresses in two mutually perpendicular directions are 45 MPa and 25 MPa both tensile. The complimentary shear stress in these directions is 15 MPa. By using Mohr's circle method, determine the maximum and minimum principal stresses	K3	CO1	7M
		Discuss maximum principal strain theory	K2	CO1	7M
		UNIT-II			
2	a	Find the maximum shear stress induced in a solid circular shaft of diameter 15 cm when the shaft transmits 150kN power at 180 r.p.m.	K3	CO2	7M
		A shaft has to be designed to transmit a power of 100 kW at 300 rpm. Determine the diameter required for a solid circular shaft of steel for which the permissible shear stress is 90 N/mm²	K3	CO2	7M
		OR			
	b	A closely coiled helical spring of round steel wire 8 mm in diameter having 10 complete turns with a mean diameter of 10 cm is subjected to an axial load of 350 N. Determine: (i) the deflection of the spring, (ii) maximum shear stress in the wire and (iii) stiffness of the spring. Take C= 8 x 10⁴ N/mm²	K3	CO2	14M
		UNIT-III			
3	a	A hollow C.I. column when outside diameter is 200mm has a thickness of 20mm. It is 4.5m long and fixed at both ends. Calculate the safe load by Rankine's formula using a factor of safety of 4, σ_c= 550MN/m², a = 1/1600	K3	CO3	7M
		A Strut,30 mm diameter and 2.2 m long is hinged at both ends .it carries a UDLoad of 60 N/m in addition to an axial thrust of 8000N .Calculate the maximum stress. E=200 GPa	K3	CO3	7M
		OR			
	b	Compare the crippling loads given by Rakine's and Euler's formulae for tubular strut 2.4m long having outer and inner diameters of 40.5mm and 35.5mm loaded through pin-joint at both ends. Take: Yield stress as 315MN/m²; Rankine constant a=1/7500, and E=200 GN/m².If elastic limit for the material is taken as 200MN/m²	K4	CO3	7M
		What is equivalent length of a column? Give the ratios of equivalent length and actual length of the columns with various end conditions.	K2	CO3	7M

		UNIT-IV			
4		Describe the different types of dams.Why a trapezoidal dam is mostly used these days.	K2	CO4	7M
	a	A trapezoidal masonry dam having 4.5m top width, 9.5m bottom width and 15m high, is retaining water upto a height of 12m.The density of masonry is 2000 kg/m^3 and co-efficient of friction between the dam and soil is 0.6. The allowable stress is 392400 N/m^2. Check the stability of the dam.	K4	CO4	7M
		OR			
	b	A masonry retaining wall of trapezoidal section is 10m high and retains each witch is level upto the top. The width at the top is 2m and at the bottom is 8m and the exposed face is vertical. Find the maximum and minimum intensities of normal stress at the base.	K3	CO4	14M
		UNIT-V			
5		Derive the equation of shear center for channel section	K3	CO5	7M
	a	An I-Section of a beam consists of top flange 140mmX40mm and bottom flange 140mm X 40mm, web 20mm X 220mm. The center line of web is 80mm from the left edge of flange and 60mm from the right edge. Calculate the shear center of the beam	K3	CO5	7M
		OR			
	b	A beam of rectangular section 20 mm X 40 mm has its centre line curved to a radius of 50mm. the beam is subjected to a bending moment of 45x10^5 N.mm. Solve the intensity of maximum stresses in the beam. Also plot the bending stress across the section	K3	CO5	14M

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II B.Tech II Semester Regular & Supple. Examinations, May-2023

Sub Code: R20CE2205   **HYDRAULICS AND HYDRAULIC MACHINERY**

Time: 3 hours   (CE)   Max. Marks: 70

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks   (5 X 14 = 70M)

Q.No		Questions	KL	CO	Marks
		UNIT-I			
1	a	A trapezoidal channel carries water of 25 m³/s which has a side slope of 60⁰. Find the most economical channel cross section if C = 50 and slope of bed is 1 in 1000. (C = Chezy's constant).	3	1	09
		Explain the specific energy diagram with a neat sketch.	2	1	05
		OR			
	b	Define most economical channel section. Derive the conditions for most economical channel section for maximum discharge through a circular channel section.	2	1	06
		A 8 m wide channel conveys 15 m³/s of water at a depth of 1.2 m. Calculate (i) Specific energy of the flowing water (ii) Critical Depth, Critical velocity and Minimum Specific Energy.	4	1	08
		UNIT-II			
2	a	Derive the differential equation for steady gradually varied flow open Channels and list all assumptions?	2	2	06
		A rectangular channel of 8 m wide discharges water through a sluice gate with a depth of flow of 0.4 m and velocity 6 m/s. Find whether hydraulic jump will occur and if so, find the height of hydraulic jump and loss of energy per kg of water. Also find the power lost in hydraulic jump.	5	2	08
		OR			
	b	Write the classification and characteristics of surface profiles	1	2	06
		Obtain an expression for the depth after the hydraulic jump and the loss of head due to the jump. Write the assumptions made.	2	2	08
		UNIT-III			
3	a	Obtain an expression for efficiency when jet striking an unsymmetrical moving curved vane tangentially at one of the tips.	2	3	06
		A jet of water 150 mm diameter strikes a series of flat plate normally with a velocity of 12 m/s. The plate is moving with a velocity of 6 m/s in the direction of jet. Find (i) the force exerted by the jet on the plate (ii) work done by the jet on the plate per second (iii) power of the jet (iv) efficiency of the moving plate.	3	3	08
		OR			
	b	A jet of water having velocity of 45 m/s impinges without shock on a series of vanes moving at 15 m/s, the direction of motion of vanes being inclined at 20⁰ to that of jet. The relative velocity at the outlet is 0.9 times of that of inlet. Absolute velocity of water at exit is to be normal to the motion of vanes. Find (i) Vane angles at entrance and exit (ii) Hydraulic efficiency.	3	3	14
		UNIT-IV			
4	a	Draw a neat diagram of cross section of Kaplan turbine and explain its working principle.	2	4	06

		An inward flow water turbine has blades. The inner and outer radii of which are 30 cm and 50 cm respectively. Water enters the blades at the outer periphery with a velocity of 45 m/s making an angle of 25^0 with the tangent to the wheel at the inlet tip. Water levels of the blade with a flow velocity of 8 m/s. If the blade angles at the inlet and outlet are 35^0 and 25^0 respectively. Determine (i) speed of turbine wheel (ii) work done per Newton of water.	4	4	08
		OR			
	b	Draw the energy block diagram of a Pelton wheel arrangement showing nozzle, Pelton wheel, shaft and give expressions for (i) Power at nozzle (ii) Kinetic energy of jet outside the nozzle (iii) Hydraulic power after the Pelton wheel (iv) Shaft power (v) Nozzle efficiency (vi) Hydraulic efficiency (vii) Mechanical efficiency and (viii) Overall efficiency.	2	4	14
		UNIT-V			
5	a	A centrifugal pump runs at 1000 rpm and delivers water against a head of 15 m. The impeller diameter and width at the outlet are 0.3 m and 0.05 m respectively. The vanes are curved back at an angle of 30^0 with the periphery at the outlet η_{mono} = 0.92, find discharge.	4	5	07
		A single acting reciprocating pump running at 30 rpm, delivers 0.012 m³/s of water. The diameter of the piston is 25 cm and stroke length is 50 cm. Determine: (i) The theoretical discharge of the pump, (ii) Co-efficient of discharge and (iii) Slip and percentage slip of the pump.	4	5	07
		OR			
	b	What is reciprocating pump? Describe the principle and working of a reciprocating pump with a neat sketch.	2	5	08
		A multi-stage centrifugal pump is required to lift 0.04 m³/s of water against a head of 700 m of water. If the speed of the pump is 2500 rpm find the minimum number of stages required. If the specific speed is not less than 25.	5	5	06

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NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)
II B.Tech II Semester Regular & Supple. Examinations, May-2023
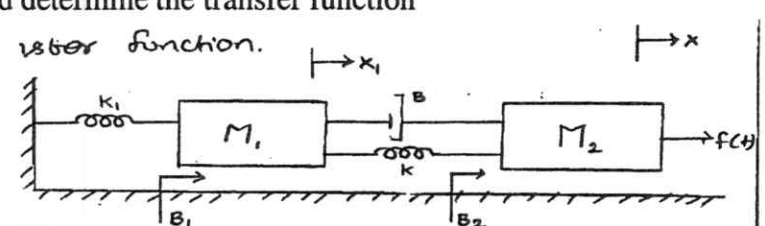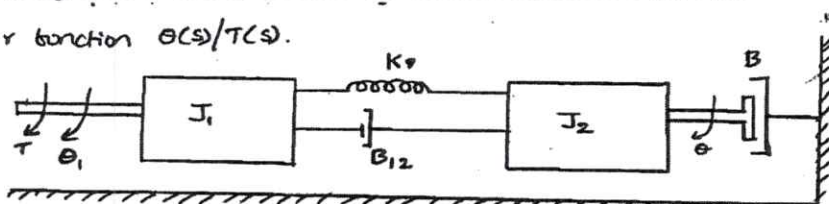
Sub Code: R20EE2203   **CONTROL SYSTEMS**

Time: 3 hours   (EEE)   Max. Marks: 70

Note: Answer All **FIVE** Questions. All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No		Questions	KL	CO	Marks
		UNIT-I			
	a	i)Explain the differences between open loop and closed loop control systems	K2	1	7
		ii)Determine the differential equations governing the mechanical system shown below and determine the transfer function	K3	1	7
1		**OR**			
	b	i)Discuss the differential equations governing the mechanical rotational system shown in fig. below and determine the transfer function $\Theta(s)/T(S)$	K3	1	7
		ii)What different types of control systems & explain any 3 of them.	K1	1	7
		UNIT-II			
	a	i)Define different time domain specifications? Derive the expressions for them.	K3	2	7
		ii) Explain standard test signals	K3	2	7
2		**OR**			
	b	i)The open loop transfer function of a unity feedback system is $G(s) = \dfrac{50}{s^2(s+2)}$. Find the steady state error and error constants for the unit step input.	K2	2	7
		ii)Determine the response of 1st order system for unit step input	K3	2	7
		UNIT-III			
3	a	i)The characteristic polynomial of a system is $s^7+9s^6+24s^5+24s^4+24s^3+24s^2+23s+15=0$. Determine the location of roots on s-plane and hence comment on the stability of the system using Routh-Hurwitz criterion	K1	3	10
		ii)Explain the location of poles on s-plane for stability.	K3	3	4
		OR			
	b	i)Sketch the root locus for unity feedback system whose open loop transfer function is, G(s) H(s) =K/S(S+4)(S²+4S+20)	K2	3	14

		UNIT-IV			
4	a	i)Sketch the Bode plot for the following transfer function and determine the system gain K for the gain cross over frequency to be 5rad/sec. $$G(s) = \frac{K s^2}{(1+0.2 s)(1+0.02 s)}.$$	K2	4	14
		OR			
	b	i) Draw the Nyquist plot for a given transfer function $G(s) = \dfrac{3}{s(1+5 s)(1+2 s)}$	K3	4	14
		UNIT-V			
5	a	I) Explain the properties of state transition matrix	K5	5	7
		ii) State and explain observability tests	K5	5	7
		OR			
	b	For the given state model $$\dot{X}(t) = \begin{bmatrix} -3 & 1 \\ -2 & -1 \end{bmatrix}\begin{bmatrix} X_1 \\ X_2 \end{bmatrix} + \begin{bmatrix} 0 \\ 1 \end{bmatrix} u(t)$$ I) check weather the given system is controllable or not ii) Also find the state transition matrix	K3	5	14

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II B.Tech II Semester Regular & Supple. Examinations, May-2023

Sub Code: R20EE2204   **ELECTRICAL MACHINES-II**

Time: 3 hours   (EEE)   Max. Marks: 70

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks   (5 X 14 = 70M)

Q.No		Questions	KL	CO	Marks
1	a	I)Explain the torque -slip characteristics of three phase induction motor	1	1	7
		II)An 18.65 KW, 4 pole, 50 Hz, 3 phase induction motor has friction and windage losses of 2.5% of the output. Full load slip is 4%. Find for full load (i) rotor copper losses (ii) rotor input (iii) shaft torque (iv) the gross mechanical torque	2	1	7
		OR			
	b	A 15kW, 400V, 50Hz, 3 phase star connected induction motor gave the following test results: No load test: 400V, 9A, 1310W Blocked rotor test: 200V, 50A, 7100W Stator and rotor ohmic losses at standstill are assumed equal. Drwa the circle diagram and calculate (i) Line current (ii) Power factor (iii) Slip (iv) Torque and efficiency at full load	2	1	14
2	a	I)Why starters are necessary for starting of three phase induction motor. What are the various types of starter. Explain auto transformer starter in detail.	2	2	7
		II)A 15 H.P., three phase, 6 pole, 50 Hz, 400 V, delta connected IM runs at 960 rpm on full load. If it takes 86.4 A on direct starting, find the ratio of starting torque to full-load torque with a star delta starter. Full load efficiency and power factor are 88% and 0.85 respectively	2	2	7
		OR			
	b	Explain the following methods of speed control scheme of three phase induction motor. (i) Cascaded connection. (ii) Slip power recovery scheme.	1	2	14
3	a	I)Explain the operation of a single phase induction motor using double field revolving theory	1	3	7
		II)Explain the no load and blocked rotor test of single phase induction motor	1	3	7
		OR			
	b	I)Explain the working principle of capacitor start-capacitor run single-phase induction motor.	1	3	7
		II)Explain the principle and operation of repulsion motor and state its applications	1	3	7
4	a	I)Explain the constructional details of alternator	1	4	7
		II)Calculate the speed and open-circuit line and phase voltages of a 4-pole,3-phase, 50 Hz star-connected alternator with 36 slots and 30 slots 30 conductors per slot. The flux per pole is 0.05wb	1	4	7

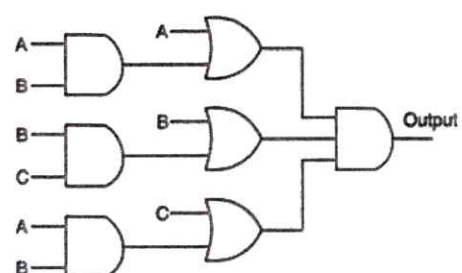|					
		OR			
	b	I)Explain the determination of voltage regulation of alternator by synchronous Impedance method.	1	4	7
		II)Two identical 2MVA alternators operate in parallel. The governor of first machine is such that the frequency droops uniformly from 50 Hz on no-load to 47.5 Hz on full-load. The corresponding uniform speed droop of the second machine is 50 Hz to 48 Hz. How will they share a load of 3MW?	2	4	7
	a	I)Explain the principle of operation of synchronous motor	1	5	7
5		II)Derive an expression for the power developed per phase of a synchronous motor	1	5	7
		OR			
		I)Explain how a synchronous motor can be operated as synchronous condenser	1	5	7
	b	II)A synchronous motor has an equivalent armature reactance of 3.3Ω. The exciting current is adjusted to such a value that the open circuit emf is 950V. Find the Power factor at which the motor would operate when it takes 80kW from 800V supply line	2	5	7

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II B.Tech II Semester Regular & Supple. Examinations, May-2023

Sub Code: R20EE2205   **DIGITAL ELECTRONICS**

Time: 3 hours   (EEE)   Max. Marks: 70

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks   (5 X 14 = 70M)

Q.No		Questions	KL	CO	Marks
		UNIT-I			
	a	i)Perform subtraction using 2's complement. a) 100010 – 100011 b) 110000 – 10101	3	1	7
		ii) Find the gray sequence of the following number $(BABA.D7)_{16}$	3	1	7
		OR			
1	b	i)Express the following numbers in decimal: (a) $(10110.0101)_2$ (b) $(26.24)_8$ (c) $(DADA.BE)_{16}$	3	1	7
		ii) a) Find the BCD addition of (459 + 999). b) Describe a self-complementing code, with example.	4	1	7
		UNIT-II			
	a	i) Show that a positive logic NAND gate is a negative logic NOR gate and vice versa.	4	2	7
2		ii) Write the Boolean expression for the logic diagram given below and simplify it. Draw the logic diagram that implements the simplified expression. 	3	2	7
		OR			
	b	i)Simplify the following Boolean function. $F(A,B,C,D)=\sum m(1,3,8,10,15)+d(0,2,9)$ Realize its logic circuit with NAND-NAND implementation.	3	2	7
		ii)Simplify function using tabulation (Quine-McCluskey) method and find essential prime implicants: $F(A,B,C,D)= \sum m(1,5,6,12,13,14)+d(2,4)$	3	2	7
		UNIT-III			
	a	i)Design a 4:2 priority encoder with D0, D1, D2, D3 as input variables; A, B as output variables for a given priority function D0>D1>D2>D3.	4	3	7
3		ii) Implement the following boolean functions with a 8x1 multiplexer. Connect the inputs A, B and C as the selection lines and D as data line. $F(A,B,C, D) = \sum m (1,2,4,7,8,9,10,11,13,15).$	3	3	7
		OR			
	b	i) Define decoder. Construct 3x8 decoder using logic gates and truth table.	3	3	7
		ii) Construct a full subtractor using a suitable demultiplexer.	4	3	7

		UNIT-IV			
4	a	i)Describe how an S-R flip-flop can be converted into a J-K flip-flop. Draw the conversion table and the logic diagram for the same.	3	4	7
		ii)Design MOD-10 Asynchronous up-counter. Draw the circuit diagram for the designed counter. Explain its operation.	3	4	7
		OR			
	b	An elevator in a two floor building has two buttons in it for representing 1st and 2nd floor. There is an elevator request button in each floor. Assume the 1st and 2nd floor buttons inside the lift are connected to respective request in the floors. Form a boolean expression and develop a digital model for the movement of the elevator when respective buttons are pressed. Note: Consider a button for indicating current position of the lift.	6	4	14
		UNIT-V			
5	a	Design an 8:4 PROM . Implement $w(a,b,c) = \Sigma(14,3)$; $x(a,b,c) = \Sigma(5)$; $y(a,b,c) = \Sigma(0,1,6)$; $z(a,b,c) = \Sigma(0,2,3,5)$ using PROM.	3	5	7
		Implement a 3-bit squaring circuit using PROM	4	5	7
		OR			
		Obtain PLA program table and show PLA hardware to implement following functions. $F1(A,B,C)= \Sigma m(3,5,6,7)$ $F2(A,B,C)= \Sigma m(0,2,4,7)$. Also realize above function using ROM showing all links.	4	5	14

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II B.Tech II Semester Regular & Supple. Examinations, May-2023

Sub Code: R20ME2203

Time: 3 hours

MANUFACTURING TECHNOLOGY
(ME)

Max. Marks: 70

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No		Questions	KL	CO	Marks
		UNIT-I			
1	a	With the help of diagrams discuss the following types of pattern: Loose piece pattern, Drawback, Gated pattern, Match plate pattern, Cope and drag patter, Sweep pattern, Skeleton pattern, Segmental pattern and follow board pattern.	2	1	14
		OR			
	b	(i)Discuss the various properties of moulding sand.	2	1	7
		(ii)Differentiate between centrifugal die casting and permanent mould casting.	2	1	7
		UNIT-II			
2	a	(i)Name and briefly explain the various equipment used in gas welding.	2	2	7
		(ii)Give a brief classification of the various welding processes.	2	2	7
		OR			
	b	(i)What are the advantages and disadvantages of D.C. and A. C. welding?	2	2	7
		(ii) Briefly explain Gas cutting in detail?	2	2	7
		UNIT-III			
3	a	With the help of neat sketches explain the following welding methods: butt welding, spot welding and seam welding.	2	3	14
		OR			
	b	Explain the following electric arc welding processes with the help of neat sketches: TIG, MIG and PAW.	2	3	14
		UNIT-IV			
4	a	(i)Discuss principle and mechanism of rolling.	2	4	7
		(ii) Explain recovery, recrystalization and grain growth	2	4	7
		OR			
	b	Explain the following:Open-die forging and Closed-die forging.	2	4	7
		ii)Explain various defects in forging.	2	4	7
		UNIT-V			
5	a	(i)List the advantages, limitations and applications of extrusion process.	2	5	7
		(ii)Explain briefly the following extrusion processes: Hydrostatic extrusion; Impact extrusion	2	5	7
		OR			
	b	(i)Describe briefly the extrusion defects.	2	5	7
		(ii)Explain the following processes: Tube Drawing and wire drawing	2	5	7

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II B.Tech II Semester Regular & Supple Examinations, May-2023

Sub Code: R20ME2204 **APPLIED THERMODYNAMICS**

Time: 3 hours (ME) Max. Marks: 70

Note: Answer All **FIVE** Questions. All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No		Questions	KL	CO	Marks
		Unit-I			
1	a	Compare four stroke and two stroke cycle engines. Bring out clearly their merits and demerits	K2	CO1	[7M]
		The diameter and stroke length of a single cylinder two stroke gas engine working on constant volume cycle are 200 mm and 300 mm respectively with clearance volume 2.78 liters. When the engine is running at 135 rpm, the indicated mean effective pressure was 5.2 bar and the gas consumption is 8.8 m^3 /hr. If the calorific value of the gas used is 16350 KJ/m^3, find (I) Air standard efficiency, (ii) Indicated power developed by the engine, and (iii) Indicated thermal efficiency of the cycle	K3	CO1	[7M]
		OR			
	b	Compare air standard cycle with fuel air cycle	K3	CO1	[7M]
		An air standard dual cycle has a compression ratio of 16, and compression begins at 1 bar, 50^{0}C. The maximum pressure is 70 bar. The heat transferred to air at constant pressure is equal to that at constant volume. Estimate (i) the pressures and temperatures at critical points of the cycle, (ii) the cycle efficiency, and (iii) the m.e.p of the cycle	K3	CO1	[7M]
		Unit-II			
2	a	Explain the effect of engine variables on the flame speed in SI engines	K2	CO2	[7M]
		Explain the phenomenon of knocking in SI engine. What are the effects of knocking?	K3	CO2	[7M]
		OR			
	b	Discuss in detail the various stages of combustion in the C.I. Engines	K2	CO2	[7M]
		What is the purpose of testing an engine? Name the various measurements that are to be taken in an IC engine test	K2	CO2	[7M]
		Unit-III			
3	a	What is the importance of heat balance sheet analysis in case of CI engine?	K2	CO3	[7M]
		An ideal diesel cycle with air as the working fluid has a compression ratio of 18 and a cut-off ratio off 2. At the beginning of compression, the air is at 100 kPa, 27^{0}C and 1917cm^3. Determine (a) the pressure and temperature of air at each point, (b) the net work and the thermal efficiency, and (c) the mean effective pressure	K3	CO3	[7M]
		OR			
	b	The power output of an IC engine is measured by a rope brake dynamometer. The diameter of brake pulley is 700 mm and rope diameter is 25 mm. The load on the brake drum is 500 N and spring balance reads 50 N. The engine runs at 900 rpm and consumes 4 kg/hr of fuel with a calorific value of 44000 KJ/kg. Calculate (i) Brake power, (ii) Brake specific fuel consumption, and (iii) Brake thermal efficiency	K4	CO3	[7M]
		Why Morse test is not suitable for single cylinder engine? Describe the method of finding frictional power using Morse test	K2	CO3	[7M]

		Unit-IV			
4		Explain the effect of inter cooling in a multistage reciprocating compressor	K2	CO4	[7M]
	a	Determine the size of the cylinder for a double acting air compressor of 40 KW indicated power, in which air is drawn at 1 bar and 15^{0}C and compressed according to the law PV $^{1.2}$= constant to 6 bar. The compressor runs at 100 rpm with average piston speed of 152.5 m/min. Neglect clearance	K3	CO4	[7M]
		OR			
	b	Derive the equation for work required for a single stage reciprocating air compressor	K3	CO4	[7M]
		Differentiate between positive displacement compressors and dynamic compressors	K2	CO4	[7M]
		Unit-V			
5		Explain with a neat diagram about the working of centrifugal air compressor with velocity diagram.	K2	CO5	[7M]
	a	An air compressor takes in air at 1 bar and 20^{0}C and compresses it according to law pv$^{1.2}$ = constant. It is then delivered to a receiver at a constant pressure of 10 bar. R=0.287 KJ/Kg K. Determine: (i) Temperature at the end of compression (ii) Work done and heat transferred during compression per kg of air.	K4	CO5	[7M]
		OR			
	b	An axial flow compressor with an overall is entropic efficiency of 85% draws air at 20^{0}C and compresses it in the pressure ratio of 4:1. The mean blade speed and flow velocity are constant throughout the compressor. Assuming 50% reaction and taking blade velocity as 180m/s and work input factor as 0.82, calculate i) Flow velocity ii) Number of stages take α_1=12^{0}and β_1=42^0	K3	CO5	[10M]
		What do you mean by multistage compression? And state its advantages.	K2	CO5	[4M]

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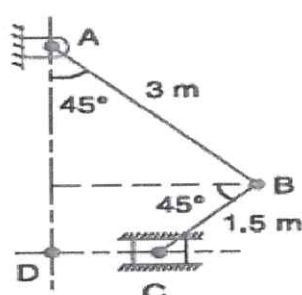**Sub Code:** R20ME2205   **KINEMATICS OF MACHINERY**

Time: 3 hours   (ME)   Max. Marks: 70

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks   (5 X 14 = 70M)

Q.No		Questions	KL	CO	Marks
		UNIT-I			
1	a	(i) Explain with neat sketches the various inversions of Four bar Chain Mechanism.	K2	01	7M
		(ii) Explain briefly lower and higher pairs with examples.	K2	01	4M
		(iii) Write notes on complete and incomplete constraint motion.		01	3M
		OR			
	b	(i) Explain Whitworth quick return mechanism with a neat sketch.	K2	01	7M
		(ii) Explain the different inversions of the double slider crank chain.	K2	01	7M
		UNIT-II			
2	a	(i) Explain with a neat sketch how the Davis steering gear mechanism works?	K2	02	10 M
		(ii) Explain about the Ackerman steering gear mechanism and bring out the advantages of it.	K2	02	4M
		OR			
	b	(i) Derive an expression for the ratio of angular velocities of the shafts of a Hooke's joint	K3	02	10M
		(ii) In a Hooke's joint the angle between the shafts is 15^0. Find the angles turned by the driving shaft when the velocity of the driven shaft is maximum, minimum and equal to that of driving shaft. Also, determine when the driven shaft will have the maximum acceleration and retardation.	K3	02	4M
		UNIT-III			
3	a	PQRS is a four-bar chain with link PS fixed. The lengths of the links are PQ= 62.5 mm; QR = 175 mm; RS = 112.5 mm; and PS = 200 mm. The crank PQ rotates at 10 rad/s clockwise. Draw the velocity and acceleration diagram when angle QPS = 60° and Q and R lie on the same side of PS. Find the angular velocity and angular acceleration of links QR and RS.	K3	03	14M
		OR			
	b	In the mechanism shown in Figure, the slider C is moving to the right with a velocity of 1 m/s and an acceleration of 2.5 m/s². The dimensions of various links are AB = 3 m inclined at 45° with the vertical and BC = 1.5 m inclined at 45° with the horizontal. Determine: 1. The magnitude of vertical and horizontal component of the acceleration of the point B, and 2. The angular acceleration of the links AB and BC.	K3	03	14M

		UNIT-IV			
		(i) A tangent cam operates a roller follower. Assuming suitable dimensions sketch the position velocity and acceleration diagrams	K3	04	7M
	a	(ii) Derive the expressions for position-velocity and acceleration of the follower undergoing uniform acceleration and deceleration during the rise and indicate the same on neat sketches	K3	04	7M
4		OR			
	b	An offset translating roller follower is driven by a SHM cam rotating at 600 rpm. The maximum follower rise is 30 mm during 150^0 of cam rotation and the prime circle radius of the cam is 4 mm. If the amount of offset is 0.5 mm, Find (i) pressure angle for the offset follower at a cam angle of 60^0, and (ii) the pressure angle for radial follower at a cam angle of 70^0.	K3	04	14M
		UNIT-V			
5	a	An epicyclic gear train, as shown in the figure given below, is composed of a fixed annular wheel A having 150 teeth. The wheel A is meshing with wheel B which drives wheel D through an idle wheel C, D being concentric with A. The wheels B and C are carried on an arm which revolves clockwise at 100 r.p.m. about the axis of A and D. If the wheels B and D have 25 teeth and 40 teeth respectively, find the number of teeth on C and the speed and sense of rotation of C.	K3	05	14M
		OR			
	b	(i) Explain the terms Pressure angle, addendum and pitch	K2	05	6M
		(ii) Write the differences between cycloidal, involute tooth forms	K3	05	4M
		(iii) What is Law of gearing?	K1	05	4M

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II B.Tech II Semester Regular & Supple Examinations, May-2023

Sub Code: R20EC2202   **INTERNET OF THINGS**

Time: 3 hours   (ECE)   Max. Marks: 70

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No		Questions	KL	CO	Marks
1	a	What are the main challenges of an Internet of Things (IoT)?	2	1	7 M
		Discuss about different communication Technologies.	2	1	7 M
		OR			
	b	Explain the different characteristics of IoT.	2	1	7 M
		What kind of information do Internet of Things (IoT) objects communicate?	2	1	7 M
2	a	Discuss about Information model specification.	2	2	7 M
		Discuss in detail about Domain model specification of IoT system.	2	2	7 M
		OR			
	b	Discuss about service specification of IoT design.	2	2	7 M
		Discuss about functional view specification.	2	2	7 M
3	a	Write the Differences between IOT and M2M.	2	3	7 M
		What are the different types of Sensors used in IoT Network?	2	3	7 M
		OR			
	b	What are the differences between SDN and NFV.	2	3	7 M
		How does M2M communication work? Explain.	2	3	7 M
4	a	Discuss about components of Arduino UNO board.	2	4	7 M
		Explain about System on Chips.	2	4	7 M
		OR			
	b	Why we need to choose raspberry pi to develop IOT applications?	2	4	7 M
		Differentiate between sensors and actuators.	2	4	7 M
5	a	Discuss about Agriculture applications of IoT.	2	5	7 M
		Analyze Home Applications of IOT.	2	5	7 M
		OR			
	b	How does IoT and Smart City application are worked.	2	5	14 M

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II B.Tech II Semester Regular & Supple. Examinations, May-2023

Sub Code: R20EC2203   **ANALOG AND DIGITAL COMMUNICATIONS**

Time: 3 hours   (ECE)   Max. Marks: 70

Note: Answer All **FIVE** Questions. All Questions Carry Equal Marks   (5 X 14 = 70M)

Q.No		Questions	KL	CO	Marks
1	a	Explain the demodulation of AM using envelope detector.	2	1	7M
		In an AM-SC system, modulating signal is a single tone sinusoid $4\cos2\pi x10^3t$ which modulates a carrier signal $6\cos2\pi x10^6t$. Write the equation of the modulated wave. Plot the two-sided spectrum of the modulated wave. Calculate the amount of power transmitted.	3	1	7M
		OR			
	b	Obtain the expressions for single tone FM and PM by defining modulation index in each case.	3	1	7M
		Compare FM and AM systems.	2	1	7M
2	a	Discuss with neat block diagram explain the operation of Low-Level Transmitter.	2	2	7M
		Explain the Block Diagram of Super heterodyne Receiver and write its applications.	2	2	7M
		OR			
	b	Discuss with neat block diagram explain the operation of High-Level Transmitter.	3	2	7M
		Draw the block diagram of TRF Receiver and explain each block in detail.	2	2	7M
3	a	Explain any four Standards Organizations for Data Communication.	2	3	7M
		Draw the block diagram of pulse code modulation and demodulation and explain each block in detail.	2	3	7M
		OR			
	b	Comparison the various parameters of the PAM, PWM and PPM techniques with neat block diagrams of operation in detail.	3	3	14M
4	a	Distinguish between coherent and non-coherent reception. With a neat sketch, explain the modulation and detection of Quadrature Phase shift Keying	3	4	7M
		With a neat sketch, explain the non-coherent detection of FSK.	2	4	7M
		OR			
	b	Draw the representation of BPSK and calculate the error probability of BPSK.	2	4	14M
5	a	Write notes on Shanon-Fano coding.	2	5	7M
		A source emits seven messages with probabilities 1/2, 1/4, 1/8, 1/16, 1/32, 1/64, and 1/64, respectively. Obtain the Huffman code and find the average length of the code word.	3	5	7M
		OR			
	b	What is the trade-off between bandwidth and SNR?	2	5	7M
		Show that the channel capacity of an ideal AWGN channel with infinite BW is given by $C_\infty \approx 1.44\dfrac{S}{\eta}$ bits/second where S is the average signal power and $\dfrac{\eta}{2}$ is the power spectral density of WGN.	3	5	7M

II B.Tech II Semester Regular & Supple Examinations, May-2023

Sub Code: R20EC2204   **ELECTRONIC CIRCUITS AND PULSE CIRCUITS**

Time: 3 hours   (ECE)   Max. Marks: 70

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks   (5 X 14 = 70M)

Q.No		Questions	KL	CO	Marks
		UNIT-I			
1	a	Discuss the frequency response characteristics of RC-coupled Amplifier. Derive the general expressions for voltage gains at middle, low and high frequencies.	K2	1	6M
		Sketch the common emitter hybrid model and derive A_I, A_V, Z_I, Z_O.	K2	1	8M
		OR			
	b	Discuss the frequency response and gain bandwidth terms of a single stage CE amplifier.	K2	1	7M
		Explain how the loading effect in early amplifier stages of a multistage Amplifier using Transistors causes in reduction in gain. Further explain whether such effect come into picture in multistage Amplifiers using FET devices	K2	1	7M
		UNIT-II			
2	a	Using a block diagram illustrate the concept of negative feedback and further explain the concept of Current Series feedback in Amplifiers.	K2	2	7M
		Draw the circuit of Emitter Follower. Discuss the nature of feedback that exists in the circuit. Derive the expressions for feedback factor b, voltage gain, input and output impedances. Discuss the circuit application as unity gain buffer Amplifier.	K3	2	7M
		OR			
	b	Draw the Voltage Shunt Feedback Amplifier circuit. Substantiate the method of sampling and the nature of feedback. Derive the expressions for voltage gain, current gain, input impedance and output impedance of the circuit.	K2	2	7M
		The gain of internal Amplifier $A = 3900$ and feedback factor $b = 0.01$ in a Voltage Series negative Feedback Amplifier. Calculate the gain A_{FB} of the Feedback Amplifier and desensitivity factor D, Sensitivity factor S. For the internal Amplifier, the input resistance $Zin = 1,200 \, \Omega$ and output impedance $Zout = 5 \, k\Omega$. Calculate the input and output impedances of the Feedback Amplifier.	K3	2	7M
		UNIT-III			
3	a	For a class B amplifier providing a 20-V peak signal to a $16 \, \Omega$ load (speaker) and a power supply of $VCC = 30$ V, determine the input power, output power, and circuit efficiency.	K3	3	7 M
		What is crossover distortion? How does a Class-AB Power Amplifier avoid crossover distortion?	K3	3	7 M
		OR			
	b	(i). Determine the maximum dissipation allowed for a 100-W silicon transistor (rated at 25°C) for a derating factor of 0.6 W/°C at a case temperature of 150°C. (ii). Sketch the circuit diagram of a complementary symmetry power amplifier, showing voltage waveforms in the circuit.	K3	3	6+8 M

		UNIT-IV			
4	a	In the diode positive peak limiting circuit of Fig. 4(a), VR = 10 V, Vi(t) = 20 sin 2πft and the diode forward resistance is Rf = 100 Ω while Rr = ∞ and Vr = 0. Neglect all capacitances in the circuit. Draw the input and output waveform if R =1.2 kΩ. Figure 4(a)	K3	4	7M
		Describe the response of low pass RC circuit for sinusoidal, square and ramp inputs.	K3	4	7M
		OR			
	b	(i). Describe the response of high pass RC circuit for sinusoidal, square and ramp inputs. (ii). What is a clamper? Discuss with the help of circuit diagram and waveforms, the operation of a clamping circuit.	K3	4	7+7M
		UNIT-V			
5	a	How the astable multivibrator works as voltage to frequency converter, explain its operation with the suitable diagram.	K3	5	7M
		List out the applications of astable and monostable multivibrator.	K3	5	7M
		OR			
	b	With a neat diagram, describe the working of a Bi-stable multivibrator. On that factors do the frequency of the output waves depend?	K3	5	7M
		What is a monostable multivibrator? Explain its working principle with the help of waveforms.	K3	5	7M

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NARASARAOPETA ENGINEERING COLLEGE

(AUTONOMOUS)

II B.Tech II Semester Regular & Supple. Examinations, May-2023

Sub Code: R20EC2205 **ELECTROMAGNETIC WAVES AND TRANSMISSION LINES**

Time: 3 hours   (ECE)   Max. Marks: 70

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks   (5 X 14 = 70M)

Q.No.		Questions	KL	CO	Marks
		UNIT-I			
	a	I) Derive an expression for force on a current element in a magnetic field	3	1	7
		II)Analyze Electric field intensity due to the presence of line charge and surface charges	3	1	7
		OR			
1	b	I)A line charge ρ_L= 50nC/m is located along the line x=2, y=5 in free space. i) find E at P(1,3,-4) ii) If the surface x=4 contains a uniform surface charge denisity ρ_s= 18 nC/ m^2, at what point in z=0 plane E_{total} =0	3	1	7
		II)Explain the differences between magnetic vector potential and magnetic scalar potential	2	1	7
		UNIT-II			
	a	I)Derive the expression for one of the Maxwell's equation $\nabla\times E = -\partial B/\partial t$	3	2	7
		II)Determine the propagation constant, phase velocity, intrinsic impedance of uniform plane wave in a good conductor	2	2	7
2		OR			
	b	I)Derive the expressions for potential energy stored in magnetic field	3	2	7
		II)State and prove Gauss Law and derive the relation between E and V.	2	2	7
		UNIT-III			
	a	I)Discuss the analysis of EM wave oblique incidence on dielectric with parallel and perpendicular polarizations	2	3	7
		II)Derive the continuity equation with proper analysis	3	3	7
3		OR			
	b	I)Discuss in detail about reflection and refraction of plane wave	3	3	6
		II)Derive the equation of Uniform plane wave in free space	2	3	8
		UNIT-IV			
	a	I)Determine the transmission and reflection coefficients of a plane wave incident obliquely with E perpendicular to the plane of incidence	3	4	7
		II)For a Transmission line terminated in Z_0, Prove that $Z_0=\sqrt{Z_{SC}Z_{OC}}$	3	4	7
4		OR			
	b	I)Derive the condition for the distortion less propagation of a transmission line	3	4	7
		II)Derive the equation for input impedance of Transmission line in terms of load impedance	3	4	7

		UNIT-V			
5	a	I)Derive the expressions for the voltage and current at any point on the transmission line in terms of propagation constant, length and characteristic impedance of the line. Hence deduce an expression for input impedance in terms of reflection coefficient	3	5	8
		II)Explain the applications of Quarter-wave and Half-wave Transmission line?	2	5	6
		OR			
	b	I)Discuss the analysis of following: I.a) Reflection on a line not terminated with Z_o I.b) Open and short circuited lines	2	5	8
		II) A lossless 60Ω line is terminated by a 60+j60Ω load. Find reflection coefficient and SWR	2	5	6

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II B.Tech II Semester Regular & Supple. Examinations, May-2023

Sub Code: R20CS2202

FORMAL LANGUAGES AND AUTOMATA THEORY

Time: 3 hours (CSE) Max. Marks: 70

Note: Answer All **FIVE** Questions. All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No		Questions	KL	CO	Marks
		UNIT-I			
1	a	What is Finite State Automata? And explain about the Components and elements of Finite State Automata.	K2	CO1	7
		Discuss about the advantages, disadvantages and applications of Finite State Machine.	K2	CO1	7
		OR			
	b	Define a Language. And discuss about different language operations with an examples.	K2	CO1	7
		What is a grammar? And explain all types of Generative Grammars with an example.	K2	CO1	7
		UNIT-II			
2	a	Write and explain the procedure to convert from NDFA with ε to DFA with an example.	K4	CO2	7
		Discuss the differences between NDFA and DFA.	K4	CO2	7
		OR			
	b	Distinguish between Moore Machine and Mealy Machine.	K4	CO2	4
		Write the procedure to convert Moore machine into its equivalent Mealy machine.	K4	CO2	3
		Design a Moore machine to generate 1's complement of a given binary number. And Convert that Moore machine into its equivalent Mealy machine.	K4	CO2	7
		UNIT-III			
3	a	What is the meaning of DFA minimization? And write the procedure of DFA minimization.	K4	CO3	7
		Simplify (Minimize/Optimize) the following DFA. 	K4	CO3	7
		OR			
	b	Define 2DFA. And distinguish between DFA and 2DFA with an example.	K4	CO3	7
		How language is associated with regular expression? And explain all regular expression operations with an example.	K4	CO3	7
		UNIT-IV			
4	a	Explain minimization of CFG? Simplify the following grammar S -> a|aA|B|C, A -> aB| ε, B -> Aa , C -> cCD D -> ddd	K3	CO4	7
		What is a Greibach Normal Form (GNF)? Write the procedure to convert from CFG to GNF.	K3	CO4	7

		OR			

	b	Write a short notes on following:
		  i) Derivation
		  ii) Ambiguous grammar
		  iii) Regular grammar
		  iv) Unit productions
			K3	CO4	7

		Design a PDA, which accepts the language as $L = \{WW^R \mid W \in (0+1)^*\}$ and verify the string acceptance by empty stack.	K3	CO4	7
		UNIT-V			
5	a	What is a Turing Machine? And explain about the components of a Turing Machine.	K3	CO5	6
		Construct the Turing Machine, for the language $L = \{0^n1^n2^n\}$ where $n \geq 1$.	K3	CO5	8
		OR			
	b	Construct a Turing Machine for checking the palindrome of the string of even length.	K3	CO5	7
		Distinguish between class P and class NP Problems with an example.	K3	CO5	7

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II B.Tech II Semester Regular & Supple Examinations, May-2023

Sub Code: R20IT2202 **DESIGN ANALYSIS OF ALGORITHMS**

Time: 3 hours (IT) Max. Marks: 70

Note: Answer All **FIVE** Questions. All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No		Questions	KL	CO	Marks
1	a	Write the pseudo code for binary search	2	1	7
		Using step count find the time complexity of sum of 'n' natural numbers	2	1	7
		OR			
	b	Describe the characteristics of algorithm with an example	2	1	7
		Give the algorithm for transpose of a matrix m x n and determine the time complexity of the algorithm by frequency – count method	2	1	7
2	a	Describe the control abstraction for divide and conquer.	2	2	7
		Derive the Best, Worst and Average time complexities of Quick sorting technique	3	2	7
		OR			
	b	Explain the strassens matrix multiplication with example	3	2	14
3	a	Explain the jod sequencing with deadlines with example	3	3	7
		Find optimal solution to the knapsack problem instance n=6, m=15, $(p1...p6) = (10,5,15,7,6,18)$, $(w1...w6) = (2,3,5,7,1,4)$	3	3	7
		OR			
	b	Explain Kruskal's Minimum cost spanning tree algorithm with suitable example.	3	3	14
4	a	Consider $A_1=5X4$, $A_2=4X6$, $A_3=6X2$, $A_4=2X7$. $P_1=5$, $P_2=4$, $P_3=6$, $P_4=2$, $P_5=7$ and Apply matrix chain multiplication to obtain optimal sequence	3	4	7
		Obtain the solution to 0/1 knapsack problem by Dynamic Programming method n=6, $(p1, p2,...p6)=(w1,w2,...w6)=(100,50,20,10,7,3)$ and m=165	3	4	7
		OR			
	b	Construct a system with multiple devices connected parallel in three stages. The costs of the devices are 25, 10 and 15 respectively. The cost of the system is to be no more than 100. The reliability of each device type is 0.8, 0.7 and 0.4 respectively	3	4	14
5	a	Give the statement of sum –of subsets problem. Find all sum of subsets for n=4, (w1, w2, w3, w4) = (11, 13, 24, 7) and M=31.Draw the portion of the state space tree using fixed – tuple sized approach.	3	5	14
		OR			
	b	Solve the Travelling Salesman problem using branch and bound technique $$\begin{bmatrix} \infty & 5 & 1 & 10 & 6 \\ 1 & \infty & 4 & 12 & 7 \\ 3 & 6 & \infty & 4 & 16 \\ 7 & 1 & 3 & \infty & 9 \\ 16 & 12 & 7 & 6 & \infty \end{bmatrix}$$	3	6	14

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II B.Tech II Semester Regular & Supple Examinations, May-2023

Sub Code: R20IT2205
COMPUTER NETWORKS
Time: 3 hours
(IT)
Max. Marks: 70

Note: Answer All **FIVE** Questions.
All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No		Questions	KL	CO	Marks
		UNIT-I			
	a	Explain ISO - OSI model in detail	K2	CO1	10
		Discuss about Internet standards.	K2	CO1	4
1		OR			
	b	Explain the different topologies of the network	K2	CO1	7
		Illustrate some of the factors that determine whether a communication system is a LAN or WAN?	K2	CO1	7
		UNIT-II			
	a	List the responsibilities of the data link layer ?	K2	CO2	7
		Explain error detection and error correction techniques	K2	CO2	7
2		OR			
	b	Explain the concept of Checksum with example	K2	CO2	7
		Describe Hamming code with suitable example	K2	CO2	7
		UNIT-III			
	a	Discuss about the difference between Simplex Protocol, Simplex Stop and Wait Protocol?	K2	CO3	7
		Discuss in detail about Sliding Window protocol	K2	CO3	7
3					
	b	Explain in detail about Pure aloha and Slotted aloha and also derive its throughput	K2	CO3	7
		UNIT-IV			
	a	Define BGP Protocol. Describe its routing functionality in detail?	K2	CO4	7
		Write about Flow control and Buffering	K2	CO4	7
		OR			
4		Describe in detail about Ipv4 frame format	K2	CO4	7
	b	Explain link state routing algorithm in detail	K2	CO4	7
		UNIT-V			
	a	Write in detail about the Electronic mail and its services	K2	CO5	7
		Discuss about Connection Establishment and Connection Release in TCP	K2	CO5	7
5		OR			
	b	Explain in detail about MIME	K2	CO5	7
		Explain about WWW	K2	CO5	7

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II B.Tech II Semester Regular & Supple. Examinations, May-2023

Sub Code: R20AI2202   AUTOMATA AND COMPILER DESIGN

Time: 3 hours   (AI)   Max. Marks: 70

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks   (5 X 14 = 70M)

Q.No		Questions	KL	CO	Marks
1	a	Discuss about equivalence of NFA and DFA with an examples.	K3	CO1	7M
		Explain Applications of Finite Automata.	K3	CO1	7M
		OR			
	b	Construct a DFA to accept the language L={w/w has both an even number of 0's and even number of 1's}.	K3	CO1	7M
		Explain different phases of compilers.	K3	CO1	7M
2	a	Give Predictive parsing Algorithm and Construct LL(1) parsing table for the following grammar: E-> TE' ; E'-> +TE' | ϵ ; T-> FT' ; T' -> *FT' | ϵ F -> (E) | id .	K3	CO2	7M
		Explain process of left recursion and left factoring with example	K3	CO2	7M
		OR			
	b	Consider the grammar G, S -> aB / bA ; A-> a / aS / bAA ; B-> b/ bS / aBB For the string aaabbabbba , construct i) Leftmost Derivation Tree. ii) Rightmost Derivation Tree.	K3	CO2	7M
		Explain error recovery in predictive parsing.	K3	CO2	7M
3	a	Construct Operator precedence table for the following grammar E-> E+T ; E ->T; T-> T*F; T ->F; F-> id	K3	CO2	7M
		Explain how you can use handle and handle pruning in shift-reduce with an example.	K3	CO2	7M
		OR			
	b	Explain dangling ELSE ambiquity	K3	CO2	14M
4	a	What is dependency graph? Construct dependency graph for the expression a-4+c using syntax directed definition of E ->TE1 E1-> +TE1/-TE1/ϵ , T ->(E)/id/num	K2	CO4	7M
		Differentiate inherited and synthesized attributes with an example.	K2	CO4	7M
		OR			
	b	Explain different storage allocation strategies.	K2	CO4	14M
5	a	Write the algorithm to generate basic blocks and flow graph for quick sort algorithm.	K3	CO5	7M
		Explain register allocation and assignment	K3	CO5	7M
		OR			
	b	Explain how code motion and frequency reduction used for loop optimizations?	K3	CO5	14M

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II B.Tech II Semester Regular & Supple Examinations, May-2023

Sub Code: R20AI2205   **INTRODUCTION TO ARTIFICIAL INTELLIGENCE**

Time: 3 hours   (AI)   Max. Marks: 70

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks   (5 X 14 = 70M)

Q.No		Questions	KL	CO	Marks
		Unit-I			
1	a	Define the problem as a state space search.	K2	CO-1	7
		What is Agent? Explain types of Agents.	K2	CO-1	7
		OR			
	b	Explain the control strategies in a Production System.	K2	CO-1	7
		Explain about Heuristic Search.	K2	CO-1	7
		Unit-II			
2	a	Represent Simple Facts in Logic.	K4	CO-2	7
		Define Heuristic Search. Explain about steepest hill climbing.	K4	CO-2	7
		OR			
	b	Explain Best-First Search(greedy approach), A* search Algorithm.	K4	CO-2	7
		Explain the control strategies in a Production System.	K4	CO-2	7
		Unit-III			
3	a	What is Constraint Satisfaction, describe it with an example.	K2	CO-3	7
		Write in detail Forward versus Backward Reasoning.	K2	CO-3	7
		OR			
	b	Explain Strong Slot-and- Filler structures.	K2	CO-3	7
		Write in detail about Semantic Nets with examples.	K2	CO-3	7
		Unit-IV			
4	a	Explain Rote learning with Example.	K3	CO-4	7
		Write learning in problem solving Markov decision problem.	K3	CO-4	7
		OR			
	b	Explain Q-learning, Q-learning algorithm.	K3	CO-4	7
		Write Temporal difference algorithm.	K3	CO-4	7
		Unit-V			
5	a	Explain statistical Natural Language processing.	K3	CO-5	7
		Explain Distributed reasoning Systems.	K3	CO-5	7
		OR			
	b	Explain Syntactic processing with Example.	K3	CO-5	7
		Explain Discourse and Pragmatic Processing with Example.	K3	CO-5	7

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II B.Tech II Semester Regular & Supple Examinations, May-2023

Sub Code: R20CC1OE11   **WEB DEVELOPMENT USING MEAN STACK**

Time: 3 hours   (CSE)   Max. Marks: 70

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks   (5 X 14 = 70M)

Q.No		Questions	KL	CO	Marks
		Unit-I			
1	a	Explain all the Structural Directives with examples.	2	1	7M
		Explain about Life Cycle of Angular Components	2	1	7M
		OR			
	b	Explain Angular architecture.	2	1	7M
		Explain Services and Dependency Injection with example program.	2	1	7M
		Unit-II			
2	a	Write the process of installation of angular material module and explain the use of it.	2	2	7M
		Apply angular material module to create a toolbar in an angular app.	4	2	7M
		OR			
	b	Illustrate reactive forms validation with an angular app.	2	2	7M
		Explain the process of communicating with backend services using HTTP and list down the major features of HTTP client service.	2	2	7M
		Unit-III			
3	a	Illustarate the process of installing packages in node JS using node package manager and explain any three package features	3	3	14M
		OR			
	b	Write about the creation of Node.js webserver with code.	2	3	14M
		Unit-IV			
4	a	How does Node.js work? Why is Node.js is single Threaded? Explain elaborately with neat diagram.	2	4	7M
		List down the features of Express.js and advantages of Express with Node.js.	2	4	7M
		OR			
	b	Write how to create an Express.js Server with code.	3	4	14M
		Unit-V			
5	a	How to access MongoDB in Node.js and connecting to MongoDB with code.	2	5	7M
		Explain the process of inserting documents into MangoDB database with code.	2	5	7M
		OR			
	b	Write about deleting documents from MangoDB database with code.	3	5	7M
		Briefly illustrate about updating documents in MangoDB database with code.	2	5	7M

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NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

II B.Tech II Semester Regular Examinations, May-2023

Sub Code: R20CSHN02

DATA ANALYTICS AND VISUALIZATION

Time: 3 hours   (CSE, IT, AI)   Max. Marks: 70

Note: Answer All **FIVE** Questions.
All Questions Carry Equal Marks   (5 X 14 = 70M)

Q.No		Questions	KL	CO	Marks
		Unit-I			
1	a	Explain Data Scientist role in Data Analytics.	K3	CO1	7M
		Explain different data types NumPy.	K3	CO1	7M
		OR			
	b	Discuss different types of Data Analytics.	K3	CO1	14M
		Unit-II			
2	a	Explain the process of dropping entries from an axis.	K3	CO2	14M
		OR			
	b	Explain different features of pandas.	K3	CO2	7M
		Explain sorting, ranking and data alignment in pandas.	K3	CO2	7M
		Unit-III			
3	a	Illustrate reading Excel files using data frame.	K3	CO2	7M
		Explain the process of merging data sets	K3	CO3	7M
		OR			
	b	Describe the process loading data using HDF5	K3	CO2	14M
		Unit-IV			
4	a	Explain the process of Data Transformation	K3	CO3	14M
		OR			
	b	Illustrate merging on index with example	K3	CO3	14 M
		UNIT-V			
5	a	Explain different Data Aggregation operations.	K3	CO4	14M
		OR			
	b	Illustrate Sub-plots, colors and markers	K2	CO4	14M

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II B.Tech II Semester Regular Examinations, May-2023

Sub Code: R20CCMN03

FUNDAMENTALS OF FRONT END WEB TECHNOLOGIES

Time: 3 hours   (ECE & EEE)   Max. Marks: 70

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks   (5 X 14 = 70M)

Q.No		Questions	KL	CO	Marks
		Unit-I			
1	a	Explain the process of inserting images in HTML.	K5	CO1	7M
		Write html program to demonstrate heading tags.	K5	CO1	7M
		OR			
	b	Explain different text formatting tags.	K5	CO1	14M
		Unit-II			
2	a	Write a html program to create a form with different elements.	K3	CO3	7M
		Explain colors and canvas in html.	K3	CO3	7M
		OR			
	b	Explain the following: i) Images in HTML ii) Form elements in HTML	K3	CO3	7M
		List and Explain Multimedia elements in HTML.	K4	CO2	7M
		Unit-III			
3	a	Write CSS code that defines five classes of paragraph with different background, color, margins, padding and border style.	K5	CO3	7M
		What is external style sheet? Explain various advantages and disadvantages of external CSS	K3	CO3	7M
		OR			
	b	Explain cascading style sheets in html.	K3	CO3	14M
		Unit-IV			
4	a	Explain about following properties a. background Property b. color property c. display property	K4	CO3	7M
		Explain table layout in html.	K4	CO3	7M
		OR			
	b	Explain pseudo elements and pseudo classes in html.	K3	CO3	14M
		Unit-V			
5	a	Write about the various Objects used in Java script.	K4	CO4	7M
		Explain operators in javascript	K4	CO4	7M
		OR			
	b	Explain Functions in Java script with an example.	K3	CO4	14M

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II B.Tech II Semester Regular Examinations, May-2023

Sub Code: R20CCMN03

FUNDAMENTALS OF ARTIFICIAL INTELLIGENCE

Time: 3 hours   (ME)   Max. Marks: 70

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No			Questions	KL	CO	Marks
			Unit-I			
1	a		Define Artificial Intelligent? List out applications of it.	2	1	7M
			Write Breadth first search algorithm?	2	1	7M
			OR			
	b		List the advantages and disadvantages production system	2	1	7M
			Write the production rules of the water jug problem.	2	1	7M
			Unit-II			
2	a		Describe the heuristic search technique applied to a Best-First Search problem with an example?	4	2	7M
			Explain about steepest-ascent hill climbing	4	2	7M
			OR			
	b		Explain A* search Algorithm	4	2	7M
			Define problem reduction? Explain problem reduction with AND-OR graphs	4	2	7M
			Unit-III			
3	a		Explain the differences between Procedural and Declarative Knowledge.	2	3	14M
			OR			
	b		List out different issues in knowledge representation.	2	3	7M
			Explain the differences between Forward and Backward Reasoning	2	3	7M
			Unit-IV			
4	a		Define machine learning? What are the issues in machine learning?	3	4	7M
			Explain Markov Decision Problem with an example.	3	4	7M
			OR			
	b		What is Q-learning? Write an algorithm for Q-learning. Illustrate with an example	3	4	14M
			Unit-V			
5	a		Explain Natural Language Processing. List out applications of it.	3	5	7M
			Explain Semantic Analysis with an example	3	5	7M
			OR			
	b		Write differences between Discourse and Pragmatic Processing	3	5	7M
			Explain logic programming	2	3	7M

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