AR20

CODE: 20CET206 SET-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

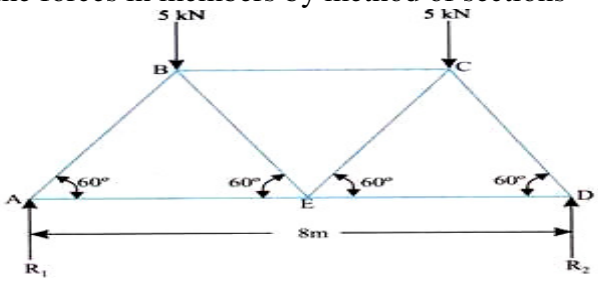
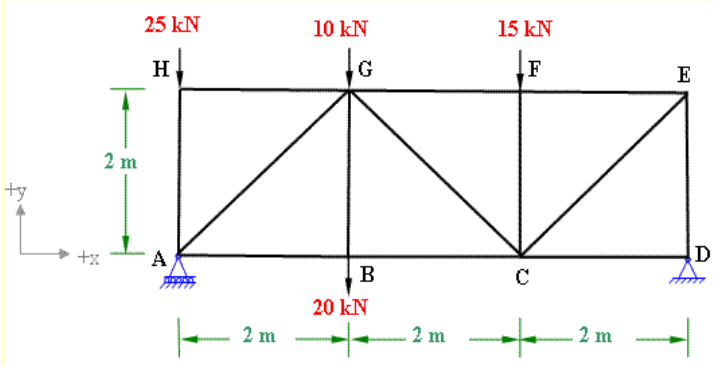
II B.Tech II Semester Supplementary Examinations, September, 2022

STRUCTURAL ANALYSIS

(Civil Engineering)

Time: 3 Hours **Max Marks: 60**

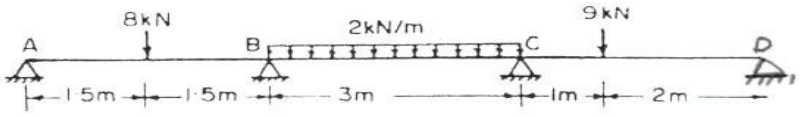
Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

		Marks	CO	Blooms Level
	UNIT-I			
1.	Determine the forces in members by method of sections 	10M	CO1	L1
	(OR)			
2.	Using the method of sections determine forces in BC,GC and GF of pin jointed plane truss shown in below figure 	10M	CO1	L4
	UNIT-II	Marks	CO	Blooms Level
3.	Derive an expression for the prop reaction in a cantilever carrying a u.d.l over the entire span and propped at the free end.	10M	CO2	L1
	(OR)			
4.	A fixed beam AB of 3m span is subjected to a point load of 15kN at a distance of half of span. Find the fixing moments of the beam under the load. Take EI = 2 x 10^3kN-m	10M	CO2	L2
	UNIT-III	Marks	CO	Blooms Level
5.	Derive the strain energy due to shear and axial load	10M	CO3	L1
	(OR)			
6.	State the Castigliano's theorem-2 and explain with example.	10M	CO3	L6
	UNIT-IV	Marks	CO	Blooms Level
7.	A 3-hinged arch is circular, 25 m in span with a central rise of 5m. It is loaded with a concentrated load of 10 kN at 7.5m from the left hand hinge. Find the i) Horizontal thrust ii) Reaction at each end hinge	10M	CO4	L2
	(OR)			

8.	Derive the expression for normal thrust radial shear and horizontal thrust for a two hinged circular arch with u.d.l	10M	CO4	L1

UNIT-V

		Marks	CO	Bloom s Level
9.	Prove the Clapeyron's theorem of Three Moments.	10M	CO5	L3
	(OR)			
10.	Analyze the continuous beam shown in Figure by Three Moment Equation	10M	CO5	L3



UNIT-VI

		Marks	CO	Blooms Level
11.	Draw the Influence line diagram for reactions of a simply supported beam of 12 m span. Also draw the influence line diagrams for Shear force and bending moments at quarter span and mid-span sections	10M	CO6	L4
	(OR)			
12.	Describe the procedure for drawing the influence lines for the forces in the vertical and diagonal members of a truss? How does it differ from the bottom chord horizontal members	10M	CO6	L5

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CODE: 20EET206 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, September, 2022

A.C. MACHINES

(Electrical and Electronics Engineering)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

			Marks	CO	Blooms Level
		UNIT-I			
1.		A 3-phase, 4-pole, 50 Hz, induction motor has a star connected wound rotor The rotor EMF is 50V between the slip rings at standstill. The rotor resistance and standstill reactance are 0.4Ω and 2.0 Ω respectively. Solve (i) rotor current per phase at starting when slip rings are short circuited (ii) Rotor current per phase at starting if 50 Ω per phase resistance is Connected between slip rings. (iii) Rotor EMF when the motor us running at full load at 1440 rpm (iv) Rotor current at full load and (v) Rotor power factor at full load	10M	CO1	BL3
		(OR)			
2.	a	Evaluate the condition for maximum torque for an induction motor?	6M		BL 5
	b	Demonstrate a power flow diagram of a three phase induction motor and explain all the stages?	4M	CO1	BL 2
		UNIT-II			
3.	a	Illustrate the principle of operation of induction generator	7M	CO2	BL 2
	b	Justify why starters are necessary for induction motors	3M		BL 5
		(OR)			
4.	A	Analyze DOL starter with neat sketch and obtain the expression for starting torque in terms of full-load torque.	6M	CO2	BL 4
	b	Classify the speed control methods of induction motor	4M		BL 2
		UNIT-III			
5.	a	An alternator runs at 250 rpm and generates an EMF at 50HZ. There are 216 slots each containing 5 conductors. The winding is distributed and full pitch. All the conductors of each phase are in series and flux per pole 30mwb which is sinusoidally distributed. If the winding is star connected, determine the value of induced available across the terminals.	7M	CO3	BL 5
	b	Illustrate about different types of armature windings?	3M		BL 2
		(OR)			
6.		A 3-phase, 16-pole alternator has the following data: Number of slots=192; conductors/slot=8; coil span=160 electrical degrees; speed of the alternator=375 rpm; flux/pole=55 mWb; Determine the phase and line voltages.	10M	CO3	BL 5
		UNIT-IV			
7.	a	Illustrate Potier triangle method of determine the voltage regulation of an alternator	7M	CO4	BL 2
	b	Explain Xd and Xq of a salient pole alternator	3M		BL 2
		(OR)			

											BL 3
8.		A 30 kVA, 440 V, 50 Hz, 3 Phase, Star connected alternator gave the following test data									

If(A)	2	4	6	7	8	10	12	14
Voc(V	155	287	395	440	475	530	570	592
Isc(A)	11	22	34	40	46	57	69	80

10M CO4

Armature resistance/ph is 0.15 Ω. Determine the regulation at full load 0.8 pf lag by MMF method

UNIT-V

9.	a	Classify the various starting methods of synchronous motor	5M		BL 4
	b	Illustrate the V-curves and inverted V-curves of synchronous motor	5M	CO5	BL 2
		(OR)			
10.		A 75KW, 400V, 4-pole, 3-phase, 50Hz, star connected synchronous motor has a resistance and synchronous reactance of 0.04Ω and 0.4Ω respectively. evaluate for full load 0.8pf lead the open circuit emf per phase and gross mechanical power developed. Assume an efficiency of 92.5%.	10M	CO5	BL 5

UNIT-VI

			Marks	CO	Blooms Level
11.	a	Explain the principle of operation of single-phase induction motor based on "double revolving field theory".	7M		BL 2
	b	Classify the different methods of starting of a single phase induction motor.	3M	CO6	BL 2
		(OR)			
12.	a	Analyze the equivalent circuit of a single phase induction motor with neat sketch.	5M		BL 4
	b	Illustrate the constructional features and working principle of capacitor start induction motor with their applications.	5M	CO6	BL 2

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CODE: 20MET206 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B. Tech II Semester Supplementary Examinations, September, 2022

MANUFACTURING TECHNOLOGY-I

(Mechanical Engineering)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

			Marks	CO	Blooms Level
		UNIT-I			
1.	a	Explain the basic steps involved in casting	5	1	Understand
	b	Outline the process of shell molding with neat sketches. Also discuss the merits and demerits of the process.	5	1	Understand
		(OR)			
2.	a	Define Pattern. Explain how the pattern is differed from casting.	5	1	Understand
	b	With the help of diagram explain the working of a cupola furnace.	5	1	
		UNIT-II			
3.	a	A cylindrical riser must be designed for a casting. The casting itself is a steel rectangular plate with dimensions 7.5 cm x 12.5 cm x 2 cm. previous observations have indicated that the solidification time for the casting is 1.6 min. the cylinder for the riser will have a diameter to height ratio as 1.Determine the dimensions of the riser so that its solidification time is 2 min.	5	2	Apply
	b	Explain the various elements of a gating system with the help of a sketch.	5	2	Understand
		(OR)			
4.		Explain Centrifugal casting with a neat sketch. Also mention the advantages and limitations of the process.	10	2	Analyse
		UNIT-III			
5.	a	Differentiate between soldering, brazing and welding.	5	3	Understand
	b	Explain about TIG welding process in detail with a sketch.	5	3	Understand
		(OR)			
6.	a	Compare the use of straight polarity and reverse polarity in arc welding.	5	3	Understand
	b	Explain about Laser beam welding process with a neat sketch.	5	3	Understand
		UNIT-IV			
7.	a	Explain the classification of rolling mills based on number of rollers with sketches	5	4	Understand
	b	Explain Tube drawing operation with a neat sketch.	5	4	Understand
		(OR)			
8.	a	Discuss about the relative merits and demerits of hot working process compared to cold working process.	5	4	Understand
	b	Explain forward extrusion process with neat sketch. Also mention merits and demerits of the process.	5	4	Understand
		UNIT-V			
9.		Explain in detail about the following with neat sketches: (i) Smith forging (ii) Press forging (iii) drop forging	10	5	Understand
		(OR)			
10.	a	Explain deep drawing operation with neat sketch.	5	5	Understand
	b	Explain fullering and edging in forging operation with relevant sketch.	5	5	Understand
		UNIT-VI			
11.		Enumerate various high energy rate forming processes. Explain any one process with neat sketch. Also mention its applications.	10	6	Understand
		(OR)			
12.		Explain the following techniques with neat sketch. Also mention the applications of each process. (i)Injection moulding (ii)Blow moulding	10	6	Understand

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CODE: 20ECT206 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, September, 2022

ANALOG COMMUNICATIONS

(Electronics and Communication Engineering)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

			Marks	CO	Blooms Level
		UNIT-I			
1.		What is the principle of Amplitude modulation? Derive expression for the AM wave and draw its spectrum.	10	CO1	Understanding
		(OR)			
2.		Draw the switching Modulator and explain the process of generation of AM waves	10	CO1	Remembering
		UNIT-II	Marks	CO	Blooms Level
3.	a	With necessary circuit diagram and waveforms, explain how DSB-SC wave is generated using Balance Modulators	5	CO2	Applying
	b	Describe the coherent detection of DSB-SB modulated waves.	5	CO2	Understanding
		(OR)			
4.	a	Explain the phase discrimination method for generating SSB signal.	5	CO2	Understanding
	b	Discuss the process of Detection of FM Waves by Phase locked loop.	5	CO2	Remembering
		UNIT-III	Marks	CO	Blooms Level
5.		Show that Narrowband FM is equivalent to AM with respect to transmission bandwidth	10	CO3	Applying
		(OR)			
6.		Explain the indirect method of generation of FM wave and any one method of demodulating an FM wave.	10	CO3	Understanding
		UNIT-IV	Marks	CO	Blooms Level
7.		Discuss the Effects of feedback on the performance of AM Transmitter	10	CO4	Remembering
		(OR)			
8.		Draw the block diagram of Superhetrodyne receiver and explain the function of each block.	10	CO4	Remembering
		UNIT-V	Marks	CO	Blooms Level
9.	a	Explain, how a PPM signal can be generated from PWM signal?	5	CO5	Understanding
	b	Compare PAM, PWM and PPM pulse modulation techniques.	5	CO5	Applying
		(OR)			
10.	a	Describe the generation and demodulation of PWM with the help of block diagram.	10	CO5	Remembering
		UNIT-VI	Marks	CO	Blooms Level
11.	a	Discuss the noise performance of AM system using envelope detection.	5	CO6	Remembering
	b	What is noise? Explain the difference between thermal noise and shot noise.	5	CO6	Understanding
		(OR)			
12.	a	Define white noise and plot the power spectral density (PSD) and explain the signal to noise ratios.	5	CO6	Understanding
	b	Compare merits and demerits of TDM and FDM.	5	CO6	Applying

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CODE: 20CST206 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, September, 2022

DATABASE MANAGEMENT SYSTEMS

(Common to CSE & IT)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

			Marks	CO	Blooms Level
		UNIT-I			
1.	a)	List the advantages of DBMS? List the database Applications?	5M	CO1	K1
	b)	Explain DDL and DML in SQL	5M	CO1	K2
		(OR)			
2.	a)	Explain database storage structure.	5M	CO1	K2
	b)	Define Entity, Attribute, Instances and Schema.	5M	CO1	K1
		UNIT-II			
3.	a)	State about SELECT and PROJECT operation in Relation algebra?	5M	CO2	K3
	b)	Discuss the basic form of SQL Query? List the set operations of SQL.	5M	CO2	K3
		(OR)			
4.	a)	What is domain integrity? Give example. Define Null Values	5M	CO2	K4
	b)	Define Aggregate Functions? Discuss the use of rename operations? With example	5M	CO2	K3
		UNIT-III			
5.	a)	Define Functional dependency? Why are some functional dependencies trivial?	5M	CO3	K4
	b)	Define dependency preserving decomposition?	5M	CO3	K3
		(OR)			
6.	a)	Define Armstrong axioms of FDs? List out the problems related to decomposition?	5M	CO3	K3
	b)	Explain the concept of scheme refinement in database design?	5M	CO3	K2
		UNIT-IV			
7.	a)	Explain BCNF. What is lossless join dependency	5M	CO4	K3
	b)	Describe properties of Decomposition	5M	CO4	K2
		(OR)			
8.	a)	Define Normalization? Explain 2NF, and 3NF Normal Forms	5M	CO4	K2
	b)	Define decomposition and how does it address redundancy? Discuss the problems that may be caused by the use of decomposition.	5M	CO4	K4
		UNIT-V			
9.	a)	Define Transaction? List the properties of the transaction.	5M	CO5	K2
	b)	Explain different types of locks?	5M	CO5	K1
		(OR)			
10.	a)	Define a two-phase commit protocol. What are multiple granularities?	5M	CO5	K3
	b)	Explain Conflict Serializability and View Serializability.	5M	CO5	K3
		UNIT-VI			
11.		Explain the B+ tree index file with example.	10M	CO6	K3
		(OR)			
12.	a)	Explain Hash-based indexing. With example. What is static hashing?	5M	CO6	K4
	b)	Explain Clustered indexes. Discuss the cost model of clustered files.	5M	CO6	K4

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CODE: 18CET209 SET-2

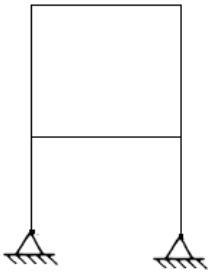
ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B. Tech II Semester Supplementary Examinations, September, 2022
STRUCTURAL ANALYSIS-I
(Civil Engineering)

Time: 3 Hours **Max Marks: 60**

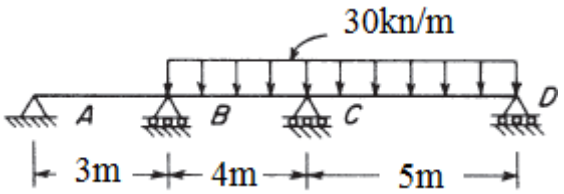
Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. a) What is the Static and Kinematic Indeterminacy of the plane frame shown in Figure. 6M

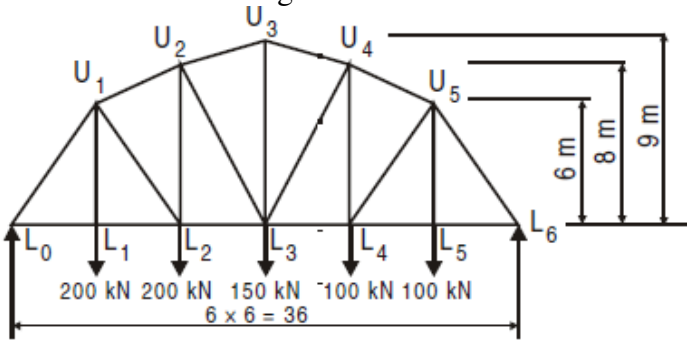


b) What is the Static and Kinematic Indeterminacy of the beam shown in Figure 6M



(OR)

2. Find the magnitude and nature of the forces in the members U3U4, L3L4 and U4L3 of the loaded truss shown in Figure. 12M



UNIT-II

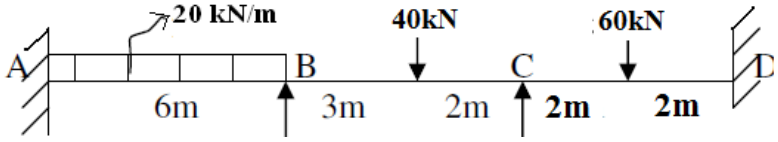
3. A propped cantilever beam of span 8m subjected to a uniformly, distributed load whose intensity is 20 kN/m is acting entire length of the beam. Draw bending moment diagram and find the maximum bending moment and locate the point of inflection. 12M

(OR)

4. A fixed beam of span 8m is subjected a UDL of 20 kN/m over the entire span and a point load of 50 kN at the middle of the span. Draw the S.F. and B.M. diagrams. 12M

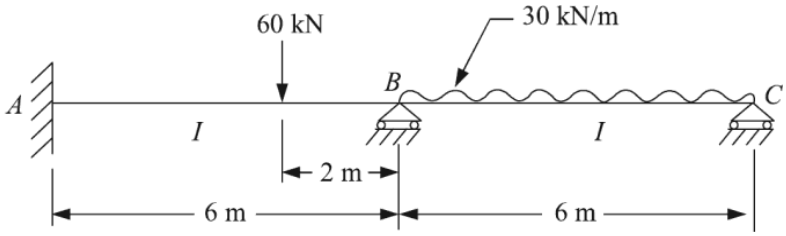
UNIT-III

5. Analyse the continuous beam shown in figure using Clapeyron's theorem of three moments and Draw the BMD 12M



(OR)

6. Analyse the beam ABC shown in figure by Clapeyron's theorem of three moments and Draw the BMD 12M

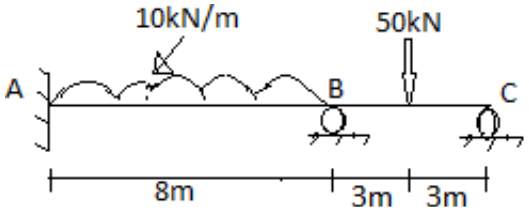


UNIT-IV

7. A simply supported beam of span 5m subjected to a point load of 50kN at 2m from the left support, determine the deflection under the point load using strain energy principle. Take E = 200GPa and I = 6x $10^{-7}m^4$. 12M

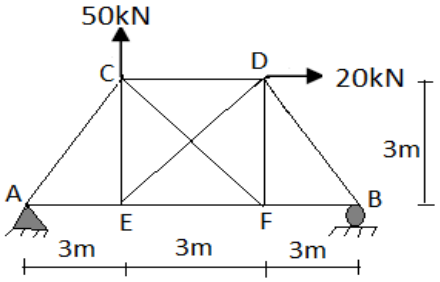
(OR)

8. Analyze the continuous beam shown in figure by the Castigliano's theorem, draw the shear force and bending moment diagrams 12M



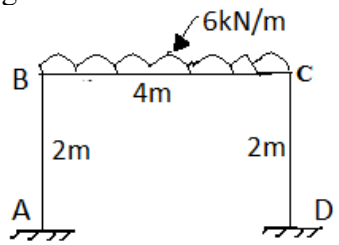
UNIT-V

9. The truss supported as shown in figure if the truss is so designed that, under the given loading, all tension members are stressed to 120 N/mm^2 and all compression members to 100 N/mm^2, find the vertical deflection of the point D. Take E= 200Gpa. 12M



(OR)

10. Determine the deflection at the midpoint of member BC for the frame loaded as shown in figure using Castigliano's theorem. EI is constant. 12M



AR18

CODE: 18EET207 SET-2

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B. Tech II Semester Supplementary Examinations, September, 2022

ELECTRICAL MACHINES-II
(Electrical and Electronics Engineering)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a)	Draw the torque slip characteristics of a induction motor and explain briefly.	12M
		(OR)	
2.	a)	Derive the Expression for torque equation of a three phase induction motor.	12M

UNIT-II

3.	a)	Write the applications of three phase induction motor.	6M
	b)	What are the different types speed control techniques of induction motor explain any 2 briefly.	6M
		(OR)	
4.	a)	Explain briefly about Blocked Rotor test on a Induction Motor.	12M

UNIT-III

5.	a)	Explain briefly the construction of Synchronous motor.	6M
	b)	Distinguish between distributed and concentrated windings employed in synchronous machines	6M
		(OR)	
6.	a)	Derive the EMF equation of a synchronous Generator.	6M
	b)	Describe briefly about the armature reaction in a Synchronous Generator.	6M

UNIT-IV

7.	a)	Explain the method for finding the voltage regulation of alternator by using synchronous impedance method	6M
	b)	Explain briefly about two reaction theory in synchronous machine.	6M
		(OR)	
8.	a)	Explain briefly about the different methods for finding the synchronous impedance of a alternator.	12M

UNIT-V

9.	a)	Explain briefly the various applications of synchronous motor.	6M
	b)	Explain briefly the operating principle of synchronous motor.	6M
		(OR)	
10.	a)	Explain briefly about V and inverted V curves in a synchronous motor.	12M

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CODE: 18MET206 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B. Tech II Semester Supplementary Examinations, September, 2022

MANUFACTURING TECHNOLOGY -I

(Mechanical Engineering)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a)	Define casting. Discuss steps in the casting process and applications	6M
	b)	Explain Shell moulding process. Discuss merits and demerits of the process	6M
		(OR)	
2.	a)	Explain the construction & zones of Cupola furnace with a neat sketch	6M
	b)	Discuss types risers in casting with neat sketches	6M

UNIT-II

3.	a)	Describe three different types of resistance welding processes	6M
	b)	Discuss types of flames of Oxy-fuel gas welding process and its applications	6M
		(OR)	
4.	a)	Explain the principle of submerged arc welding process and its applications	6M
	b)	Explain the principle of TIG welding process and its applications	6M

UNIT-III

5.	a)	Differentiate Hot working and cold working processes	6M
	b)	What is Bite angle ? Derive the length of deformation zone in rolling	6M
		(OR)	
6.	a)	Explain the Impact extrusion and hydrostatic extrusion processes	6M
	b)	Discuss Wire drawing process	6M

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UNIT-IV

7.	a)	Define forging. Discuss Upsetting forging operation and its applications	6M
	b)	Describe drop forging operation and its applications	6M
		(OR)	
8.	a)	Explain Punching, blanking and bending operations	6M
	b)	Describe Embossing and coining Processes	6M

UNIT-V

9.	a)	Explain explosive forming process and its applications	6M
	b)	Describe Electro hydraulic forming process and its applications	6M
		(OR)	
10.	a)	Explain the principle of injection moulding and its applications.	6M
	b)	Discuss the principle of blow moulding process	6M

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CODE: 18ECT208 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B. Tech II Semester Supplementary Examinations, September, 2022

ANALOG COMMUNICATIONS

(Electronics and Communication Engineering)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a)	Explain the need of modulation. And mention its advantages.	6M
	b)	Explain the generation of AM wave using square law modulator.	6M
		(OR)	
2.	a)	Explain amplitude modulation for an arbitrary baseband signal m(t) with necessary expressions, wave forms and spectrums.	6M
	b)	Explain the method of AM detection by envelope detector.	6M

UNIT-II

3.	a)	Explain the balanced modulator method to generate DSBSC waveform with neat diagram.	6M
	b)	Explain the phase discrimination method of generating SSB modulated wave with neat diagram.	6M
		(OR)	
4.	a)	Explain the coherent detection process of DSBSC modulated waveform with neat diagram.	6M
	b)	Calculate the percentage of power saving when the carrier and one of the sidebands are suppressed in a AM wave modulated to a depth of (i) 100% (ii) 50%.	6M

UNIT-III

5.	a)	Obtain the relationship between phase and frequency modulation techniques with suitable expressions and sketch the modulated outputs of both the techniques for sinusoidal modulating signal.	6M
	b)	Compare AM and FM modulation techniques.	6M
		(OR)	
6.	a)	Describe the process of detection of FM wave using phase discriminator method.	6M
	b)	Explain time division multiplexing technique with neat diagram.	6M

UNIT-IV

7.	a)	Explain phase modulated type FM transmitter with a neat block diagram.	6M
	b)	Compare AM and FM receivers.	6M
		(OR)	
8.	a)	Explain AM transmitter using low level modulation with a neat block diagram.	6M
	b)	Explicate the operation of Super heterodyne receiver with neat block diagram.	6M

UNIT-V

9.	a)	Describe the generation and demodulation of PPM with the help of block diagram.	6M
	b)	Obtain the expression for figure of merit for FM receiver.	6M
		(OR)	
10.	a)	Illustrate the modulation and demodulation of PAM with the help of block diagram.	6M
	b)	What is threshold effect in FM? Explain how it can be reduced?	6M

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AR18

CODE: 18CST207 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B. Tech II Semester Supplementary Examinations, September, 2022

DATABASE MANAGEMENT SYSTEMS

(Common to CSE & IT)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a)	What is DBMS? What are the applications of Database System?	6M
	b)	Explain in detail i. Storage Manager ii.Query Processor	6M
		(OR)	
2.	a)	Explain in detail the major components in ER Diagram and construct an E-R diagram for Online Banking system.	6M
	b)	Discuss the responsibilities of DBA and database designers?	6M

UNIT-II

3.	a)	Explain briefly about Integrity constraints.	6M
	b)	Explain the following relational algebra operations? i. Cartesian-Product ii. Division	6M
		(OR)	
4.	a)	Explain inner and outer joins with examples.	6M
	b)	Explain the Destroying and Altering tables with examples.	6M

UNIT-III

5.	a)	What are Correlated Nested Queries? Explain?	6M
	b)	Explain Aggregative Operators.	6M
		(OR)	
6.	a)	Discuss in detail about Triggers.	6M
	b)	Discuss the Basic SQL Query.	6M

UNIT-IV

7.	a)	What is Normalization? Explain different types of Normalizations?	6M
	b)	Discuss insertion, deletion and modification anomalies.	6M
		(OR)	
8.	a)	Explain two – phase locking protocol? How does it guarantee serializability?	6M
	b)	Discuss briefly Timestamp Based Protocols	6M

UNIT-V

9.	a)	Discuss briefly Failure Classification.	6M
	b)	Write short notes on Buffer Management.	6M
		(OR)	
10.	a)	Explain different types of ordered indices.	6M
	b)	Discuss about B+ Trees with example.	6M

AR16

CODE: 16CE2008 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B. Tech II Semester Supplementary Examinations, September, 2022

STRUCTURAL ANALYSIS-I

(Civil Engineering)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit

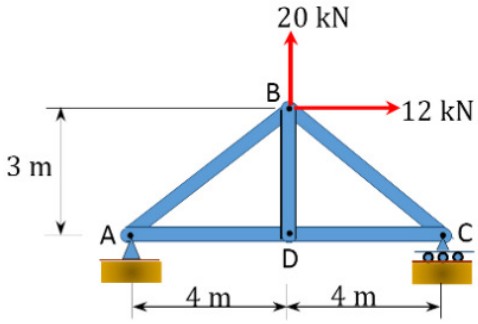
All Questions Carry Equal Marks

All parts of the Question must be answered at one place

UNIT-I

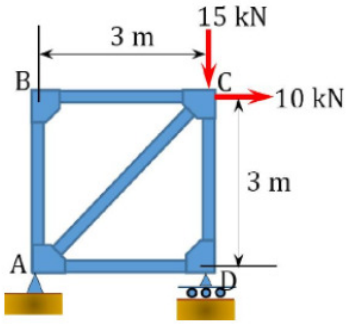
1. a) Define static and kinematic indeterminacy of structures 4 M

   b) Determine the quantity and nature of forces in the members of plane truss shown below using method of joints 10M



(OR)

2. Determine the force in each member of the truss shown below using method of joints 14M

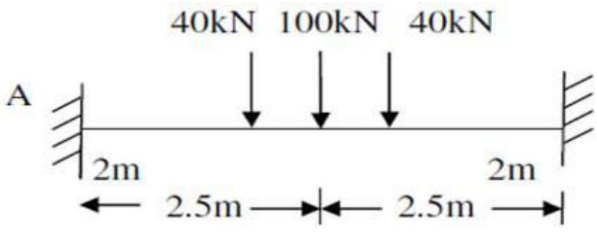


UNIT-II

3. Draw the bending moment and shear force diagram of a propped cantilever beam of span 6m due to a point load of 6 kN at the mid span. 14M

(OR)

4. A fixed beam is shown in below figure. Analyse the beam and also draw the BMD and SFD. 14M



UNIT-III

5. Derive the expression for Clapeyron's theorem of three moments of the continuous beam. 14M

(OR)

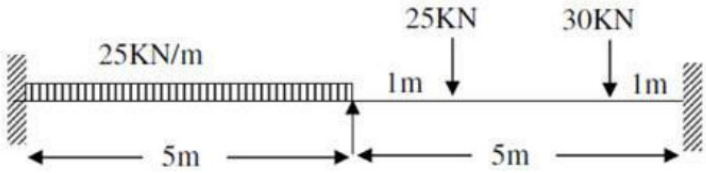
6. A continuous beam ABC is simply supported at A and C and continuous over support B with AB = 5m and BC = 6m. A uniformly distributed load of 12kN/m is acting over the beam. The moment of inertia is I throughout the span. Analyse the continuous beam using theorem of three moments and draw S.F.D and B.M.D. 14M

UNIT-IV

7. A Continuous beam is fixed at A and is supported over rollers at B and C. AB=BC=12M.The beam carries a uniformly distributed load of 30kN/m over AB and a point load of 240kN at a distance of 4m from B on span BC. B has a settlement of 30mm. E= 2 x105 N/mm2, I= 2 x 109 mm^4. Analyse the beam by slope deflection method and draw S.F.D and B.M.D. 14M

(OR)

8. Analyse the continuous beam shown below using slope deflection method and draw SFD and BMD. 14M



UNIT-V

9. Define strain energy. Derive the expression for strain energy due to bending moment 14M

(OR)

10. Determine the deflection at free end of the cantilever beam having span equal to 6m and subjected to 30 kN point load at mid span using Castigliano's theorem. 14M

AR16

CODE: 16EE2012 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, September, 2022

ELECTRICAL MACHINES-II

(Electrical & Electronics Engineering)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a)	With the help of necessary derivation, show that a rotating magnetic field is produced in a 3-phase induction motor	7M
	b)	A 3-phase induction motor with star connected rotor has an induced emf per phase of 60 V with the slip rings open circuited and normal voltage applied to stator. The resistance and standstill reactance of each rotor phase are 0.6 ohm and 0.4 ohm respectively. Calculate the rotor current per phase: (i) at stand still when the rotor circuit is connected through rheostat having a resistance of 5 ohm and reactance 2 ohm per phase. (ii) when running with slip rings short circuited with slip of 4%.	7M

(OR)

2.	a)	Sketch and explain the torque-slip characteristics of a 3-phase induction motor.	7M
	b)	A 4-pole induction motor is energized from a 50Hz supply. If the machine runs on full load at 2% slip, determine the i) Rotor speed with respect to resultant rotor field. ii) Stator resultant field speed with respect to rotor structure, and iii) Frequency of rotor currents.	7M

UNIT-II

3.	a)	Explain the methods of speed control of 3-phase induction motor by i) stator voltage control ii) Stator frequency control.	7M
	b)	4-pole, 3-phase, 50Hz induction motor has a starting current which is 5 times its full load value when switched on directly. What will be the % reduction in starting torque if the motor is started with, i) Star-delta starter ii) Auto transformer starter with 65% tapping?	7M

(OR)

4.	a)	Explain the procedure of drawing the circle diagram of an induction motor. What information can be obtained from the circle diagram?	7M
	b)	Draw the circle diagram for a 5 hp, 200v, 50Hz, 4-pole, 3-phase, star-connected induction motor from the following data: 200V,5A, 350 watts ii)100V,26A, 1700 watts. Rotor copper loss at stand still=half of the total copper loss. Estimate there from the full load current, power factor, speed, and torque.	7M

UNIT-III

5. a) Derive the expression for per phase EMF induced in a 3-ø alternator? Explain the factors affecting the value of EMF induced. 7M

   b) A 4 pole alternator has an armature with 25 slots and 8 conductors per slot and rotates at 1500 rpm and the flux per pole is 0.05 wb. Calculate the EMF generated, if winding factor is 0.96 and all the conductors in a phase are in series. 7M

(OR)

6. a) Obtain the expression for the short pitch factor & distributed winding factor? 7M

   b) A 3-Φ, 4 pole, star connected alternator has 60 slots with 2 conductors per slot. The pitch of the coil is 3 slots less than pole pitch. The flux per pole is 0.125 wb. Calculate the no load terminal voltage if the speed of alternator is 1500 rpm. 7M

UNIT-IV

7. a) What is the synchronous impedance method? Why the method is called so? What are the limitations of this theory? 7M

   b) The effective resistance of a 2200 V, 50 Hz, 440 kVA, single phase alternator is 0.5 ohms . On short circuit, a field current of 4 A gives the full load current. The EMF on open circuit for the same field current is 1160 V. Find Synchronous impedance, Synchronous reactance and % regulation of 0.6p.f lagging. 7M

(OR)

8. a) Compare the 'MMF' method and 'EMF' method of finding voltage regulation of an alternator. 7M

   b) Two similar star connected 3-Φ alternators share a load of 7500 kW equally at 6000 V and 0.8 pf lagging. The synchronous impedance of 2.5 + j50 Ω/ph. The excitation of second machine is changed, so that it delivers 40 A at a lagging pf. Find: 7M

   i. Armature current of first machine

   ii. EMF of each machine

UNIT-V

9. a) What is hunting? Why it is essential to suppress the hunting? 7M

   b) An industrial load of 4 MW is supplied at 11 kV, the power factor being 0.8 lagging. A synchronous motor is required to meet an additional load of 1103.25 kW and at the same time to raise the resultant power factor to 0.95 lagging. Determine the kVA capacity of the motor and the power factor at which it must operate. The efficiency of motor is 80 %. 7M

(OR)

10. a) With the help of vector diagram explain the operation of synchronous motor as synchronous condenser 7M

    b) A 20 MVA, 11 kV, 3-pahse delta connected synchronous motor has a synchronous impedance of 15 ohms /ph. Windage, friction & iron losses amount to 1200 kW. 7M

    i. Find the value of current at upf drawn by the motor at a shaft load of 15 MW. What is the excitation EMF under this condition?

    ii. If the excitation EMF is adjusted to 15.5 kV and shaft load is adjusted so that the motor draws, current at unity power factor, find the net motor output.

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AR16

CODE: 16ME2010 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, September-2022

THERMAL ENGINEERING - I

(Mechanical Engineering)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a)	What is the difference between air-standard cycle and fuel-air cycle analysis? Explain the significance of the fuel-air cycle.	8M
	b)	Explain with the help of a p-V diagram the loss due to variation of specific heats in an Otto cycle.	6M
		(OR)	
2.	a)	With a neat sketch explain the working principles of Four- stroke Petrol engine.	8M
	b)	Draw a port timing diagram for a two-stroke engine and explain salient features.	6M

UNIT-II

3.	a)	Briefly explain the differences between (i) pre-ignition, (ii) auto-ignition, and (iii) detonation	8M
	b)	What are the methods of detecting knock? Explain briefly.	6M
		(OR)	
4.	a)	Explain the phenomenon of knock in S.I engine with suitable sketches.	8M
	b)	Write a brief note on IC Engine fuels rating.	6M

UNIT-III

5.	a)	Explain the stages of combustion in C.I engines with the help of P-θ diagram.	8M
	b)	Compare engine knock in CI and SI engines.	6M
		(OR)	
6.	a)	Explain the direct injection combustion chamber with help of neat sketch.	8M
	b)	What is the knock rating of CI engine fuels? What is its significance?	6M

UNIT-IV

7.	a)	Find the air-fuel ratio of a four-stroke, single-cylinder, air-cooled engine with fuel consumption time for 10 cc is 20.4 s and air consumption time for 0.1 m3 is 16.3 s. The load is 17 kg at the speed of 3000 rpm. Find also brake specific fuel consumption in g/kW h and brake thermal efficiency. Assume the density of air as 1.175 kg/m3 and specific gravity of fuel to be 0.7. The lower heating value of fuel is 43 MJ/kg and the dynamometer constant is 5000.	8M
	b)	Briefly explain the willans line method for measurement of friction power	6M
		(OR)	
8.		A four stroke four-cylinder gasoline engine has a bore of 60 mm and a stroke of 100 mm. On test it develops a torque of 66.5 Nm when running at 3000 rpm. If the clearance volume in each cylinder is 60 cc the relative efficiency with respect to the brake thermal efficiency is 0.5 and the calorific value of the fuel is 42 MJ/kg. Determine the fuel consumption in kg/h and the BMEP.	14M

UNIT-V

9.	a)	Derive an expression for indicated work of a reciprocating air compressor by neglecting clearance.	8M
	b)	Differentiate Centrifugal and axial flow compressors	6M
		(OR)	
10.	a)	With help of a suitable sketch explain the working principle of a rotary compressor.	8M
	b)	A single-stage reciprocating compressor takes 1 m^3 of air per minute at 1.013 bar and 15°C and delivers it at 7 bar. Assuming that the law of compression is $pV^{1.35}$ =constant, and the clearance is negligible, calculate the indicated power.	6M

AR16

CODE: 16CS2008 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, September, 2022

DATABASE MANAGEMENT SYSTEMS

(Common to CSE & IT)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a)	What is a data model? Explain various data models	7M
	b)	Explain database system structure with neat diagram.	7M
		(OR)	
2.	a)	What is Data Independence? Explain the different types of data independence.	7M
	b)	Explain about the schemas in DBMS with examples.	7M

UNIT-II

3.	a)	A university database contains information about professors (identified by a social security number) and courses (identified by a course ID). Each of the following situations concerns the relationship set between the teacher and the student. Draw an ER diagram that describes it (assuming that no further constraints hold). i) Professors can teach the same course in several semesters, and each offering must be recorded. ii) Each professor teaches exactly one course. iii) Each professor teaches at least one course, and some professors may teach multiple courses. iv) Each professor teaches at least one course and some professors must teach all the courses.	8M
	b)	What is an integrity constraint? Brief various integrity constraints available in DBMS.	6M
		(OR)	
4.	a)	Explain Class hierarchies with neat ER diagrams.	7M
	b)	Explain the logical database design and ER to relational which suitable examples.	7M

UNIT-III

5.		Create the tables and insert two records for below schema: **Sailors** (Sid: integer, sname: string, rating: integer, age: real) **Boats** (bid: integer, bname: string, color: string) **Reserves** (Sid: integer, bid: integer, day: date) Write the following SQL queries: i. Find the names of sailors who have reserved boat 103 ii. Find the colors of boats reserved by lubber. iii. Find the names of sailors who reserved all boats called Interlake? iv. Find the names of Sailors who have reserved a red boat. v. Find the names of Sailors who have reserved at least one boat. vi. Find the names of Sailors who have reserved at least two boats. vii. Find the names of Sailors who have reserved all boats	14M

(OR)

6.	a)	What is a trigger? What are different types of triggers?	7M
	b)	Give the differences between a nested query and correlated query with suitable examples.	7M

UNIT-IV

7.		Explain 1NF, 2NF,3NF and Boyce-Codd normal form (BCNF) with suitable examples	14M

(OR)

8.	a)	List the properties of decompositions.	7M
	b)	What are the problems caused by Redundancy?	7M

UNIT-V

9.	a)	What is meant by B+ Tree? Explain its file organization?	8M
	b)	Explain about Log based recovery.	6M

(OR)

10.	a)	Discuss about Indexed sequential access methods (ISAM) with neat sketches.	10M
	b)	What are the main differences between ISAM and B+ tree indexes?	4M

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AR13

CODE: 13EE2011 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech II Semester Supplementary Examinations, September, 2022

ELECTRICAL MACHINES – II
(Electrical and Electronics Engineering)

Time: 3 Hours **Max Marks: 70**

PART-A

ANSWER ALL QUESTIONS **[1 x 10 = 10 M]**

1. a) Define voltage regulation of a transformer?
   b) What are the losses in transformer?
   c) What are the advantages of the star connection over the delta connection?
   d) A 6-pole induction motor the supply frequency was 60Hz then its synchronous speed will be?
   e) Define slip in 3 phase induction motor?
   f) Give any three applications for slipring induction motor?
   g) What is an open delta system?
   h) What is meant by Plugging?
   i) Name the tests required to draw circle diagram?
   j) What is the condition for maximum torque at starting in a 3-face induction motor?

PART-B

Answer one question from each unit **[5x12=60M]**

UNIT-I

2. a) Describe the constructional features and principle of operation of single phase transformer? 6M
   b) Calculate the regulation of a transformer in which the ohmic loss is 1%of the output and reactance drop of 5% of the voltage, when the power factor is 0.8 lagging 6M

(OR)

3. a) Draw and explain the phasor diagrams of a single phase transformer at lagging, leading and unity power factors? 12M

UNIT-II

4. a) Discuss unbalanced operation of 3phase transformers and also mention its advantages and disadvantages? 6M
   b) Three phase transformer has 400 turns on the primary and 40 turns on the secondary. The supply voltage is 3300 volts find the secondary voltage on no load and the windings are connected in star to delta, delta to star. 6M

(OR)

5. a) Draw and explain the scott connection of transformers and what are the applications? 6M

   b) In a scott connection, calculate the values of line current on 3phase side if the loads on the 2phase side are 300kW and 400kW both at 100volts and 0.7 pf lag, and the 3phase line voltage is 3300volts. The 300kW load is on the leading phase on the 2phase side. neglect transformer losses 6M

UNIT-III

6. a) Derive the condition for maximum torque of a 3 phase induction motor under running conditions? 6M

   b) A three phase induction motor has a starting torque of 100 % and maximum torque of 200% of the full load torque. determine i)slip at which maximum torque occurs ii)full load slip 6M

(OR)

7. a) Explain the power stages in three phase induction motor? 6M

   b) A three phase 4 pole,50HZ, induction motor has a slip of 2% at no load and 4% at full load find i) synchronous speed ii) no load speed iii)full load speed 6M

UNIT-IV

8. a) A 10KW, 400V, 6 pole delta connected squirrel cage induction motor gave following test results 6M
   No load test : 400V,8.1A,750W Blocked rotor test: 90V,34A,1350W
   Calculate equivalent circuit parameters

   b) Draw and discuss star to delta auto transformer starter for three phase induction motor? 6M

(OR)

9. a) Explain various methods of starting large induction motors and compare their values of starting torque? 6M

   b) A three phase 8 pole 50HZ induction motor takes 70A at full load speed of 900 RPM develops a torque of 130N-m. The starting current at rated voltage is 200A. What is starting torque? If a star delta starter is used to determine the starting torque and starting current? 6M

UNIT-V

10. a) Discuss pole changing method of speed control for a three phase induction motor? 6M

    b) The rotor of a 6 pole 50 HZ slip-ring induction motor has a resistance of 0.2 ohms per phase and runs at 960 rpm at full load and calculates the approximate resistance per phase of a rotor rheostat such that speed is reduced to 750 rpm for full load torque? 6M

(OR)

11. a) How is the speed of three phase induction motor control by its stator voltage control? 6M

    b) A 25 kW 400V three phase 4 pole 50HZ induction motor has full load slip of 5%.If the ratio of the stand still reactance to resistance per phase is 4. Estimate the plugging torque at full speed? 6M

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