AR20

CODE: 20CET206 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Regular Examinations, July, 2022

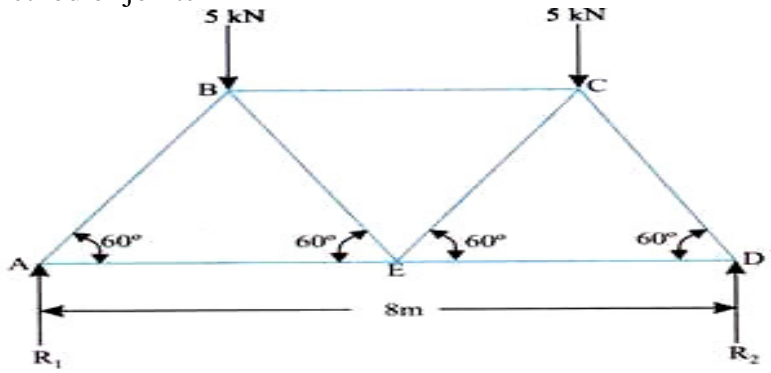
STRUCTURAL ANALYSIS

(Civil Engineering)

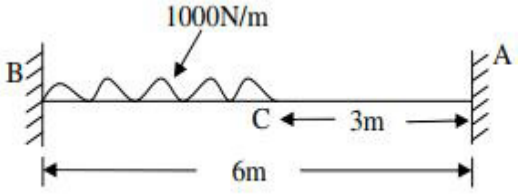
Time: 3 Hours **Max Marks: 60**

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.	Explain the procedure Determination of forces in members of plane, pin-jointed trusses by method of joints	10M	CO1	L5
	(OR)			
2.	Determine the forces in all the members of the frame shown in fig . Use method of joints	10M	CO1	L4

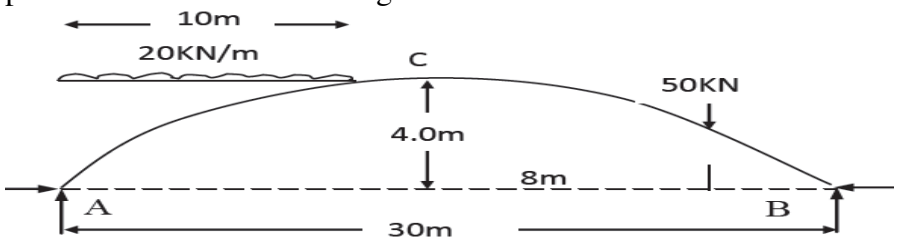


		Marks	CO	Blooms Level
	UNIT-II			
3.	A cantilever of length4m carries a uniformly distributed load of 1kN/m length over the whole length .The free end of the cantilever is supported on a prop. If E = 2 x 10^5 N/ mm2 and I = 10^8 mm^4 , then (i) find the prop reaction (ii) Draw BMD and SFD.	10M	CO2	L2
	(OR)			
4.	Find fixed end moments for the fixed beam shown in below figure.	10M	CO2	L2



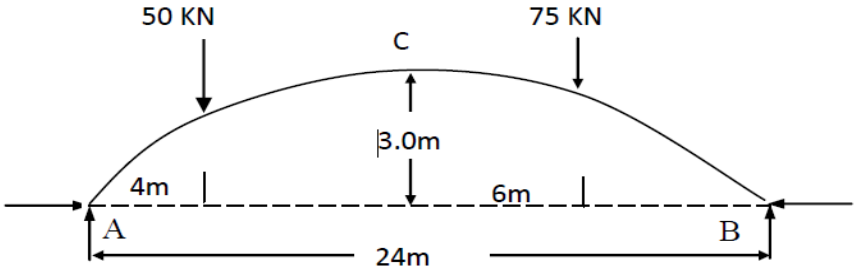
		Marks	CO	Blooms Level
	UNIT-III			
5.	a) Derive the strain energy due to shear and axial load.	5M	CO3	L1
	b) State the Castigliano's theorem-1	5M		
	(OR)			
6.	a) Derive the strain energy due to bending moment.	5M	CO3	L1
	b) State the Castigliano's theorem-2	5M		

		Marks	CO	Blooms Level
	UNIT-IV			
7.	Calculate Horizontal thrust, Reactions at supports and Maximum bending moment on a parabolic three-hinged arch is loaded as shown in figure. Draw bending moment for the arch and indicate the position of maximum bending moment.	10M	CO4	L2

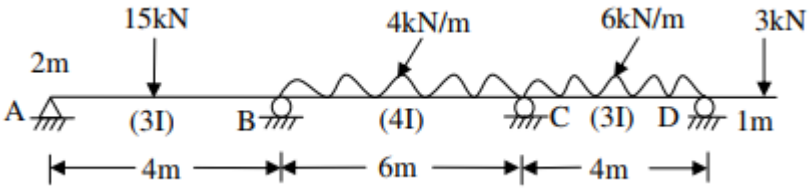


(OR)

8.	Calculate Horizontal thrust, Reactions at supports and Maximum bending moment on a parabolic three-hinged arch is loaded as shown in figure	10M	CO4	L2



		Marks	CO	Blooms Level
	UNIT-V			
9.	Analyse the beam ABCD shown in figure by Clapeyron's theorem of three moments method and draw bending moment diagram	10M	CO5	L3



(OR)

10.	Derive the Clayperon's theorem of three moments.	10M	CO5	L3

		Marks	CO	Blooms Level
	UNIT-VI			
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	L2
	(OR)			
12.	Draw the IL for bending moment for simply supported beam	10M	CO6	L2

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AR20

CODE: 20EET206 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech.II Semester Regular Examinations, July, 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

UNIT-I

			Marks	CO	Blooms Level
1.	a	Explain the production of a rotating magnetic field in a three-phase induction motor	5	CO1	B2
	b	A three-phase 6 pole, 50Hz induction motor has a slip of 2% at no load and 3% at full load. Determine synchronous speed, no load speed, full load speed, and frequency of rotor current at full load.	5	CO2	BL3
		(OR)			
2.	a	Briefly explain the equivalent circuit of an induction motor	5	CO2	BL2
	b	Derive the torque equation of a three-phase induction motor.	5	CO1	BL2

UNIT-II

			Marks	CO	Blooms Level
3.		A 4kW, 400V three-phase delta connected slip ring induction motor gave the following results OC TEST: 210V, 16A and power factor of 0.45 SC Test: 400V, 3.3A and power factor = 0.174 Draw the circle diagram and calculate maximum torque, efficiency, and line current. Assume rotor copper loss is 0.5 times the stator copper loss.	10	CO1	BL3
		(OR)			
4.	a	Explain any one speed control method for three phase induction motor.	5	CO1	BL3
	b	Explain the working of induction generator and write their applications	5	CO5	BL2

UNIT-III

			Marks	CO	Blooms Level
5		What is armature reaction and how does it affect the performance of an alternator for different power factors of load?	10	CO	B2
		(OR)			
6.	a	A 4-pole alternator has an armature with 25 slots and 8 conductors per slot. The flux per pole is 0.06wb and the machine rotates at 1500rpm. Calculate the EMF generated, if the winding factor is 0.96and all the conductors in a phase are connected in series.	5	CO3	B3
	b	Derive the EMF equation of three phase alternator.	5	CO3	B2

UNIT-IV

			Marks	CO	Blooms Level
7.		A 30kVA, 440V, 50Hz star connected alternator gave the following test data	10	CO3	B3

Field current(A)	2	4	6	7	8	10	12	14
Terminal voltage kV(L-L)	155	287	395	440	475	530	570	592
SC current(A)	11	22	34	40	46	57	69	80

The resistance between any two terminals is 0.3Ω find the regulation at full load 0.8 power factor lagging by MMF method.

(OR)

8.	a	Explain Synchronous impedance method for determining voltage regulation of an alternator	5	CO3	B2
	b	Explain Potier triangle method for determining voltage regulation of an alternator	5	CO3	B2

UNIT-V

			Marks	CO4	Blooms Level
9.		Draw the phasor diagram of a synchronous motor. Explain the effect of change in excitation if the load is constant.	10	CO4	B2

(OR)

10.	a	Write a short note on the applications of a synchronous condenser	5	CO5	B2
	b	Explain various starting methods of synchronous motors.	5	CO5	B2

UNIT-VI

			Marks	CO	Blooms Level
11.	a	Explain the working of a shaded-pole induction motor with help of necessary diagram.	5	CO6	B2
	b	Explain the working of capacitor start and run induction motor	5	CO6	B2

(OR)

12.	a	Explain double field revolving theory incase of single phase induction motor.	5	CO6	B2
	b	Obtain the equivalent circuit for single phase induction motor.	5	CO6	B2

AR20

CODE: 20MET206 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech.II Semester Regular Examinations, July, 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	Draw the cross sectional view of a well prepared mould and mention the function of each element of it.	5	1	Understand
	b	Explain the working of cupola furnace with the help of a neat sketch.	5	1	Understand
		(OR)			
2.	a	What is a pattern? Why shrinkage and machining allowances are to be provided on it? Explain.	5	1	Understand
	b	Enumerate casting defects due to faulty gating system and suggest remedies to eliminate them.	5	1	Understand
		UNIT-II			
3.	a	Interpret the significance of gating system in sand casting process.	5	2	Apply
	b	Explain different types of flames used in oxyacetylene welding With neat sketches. Also mention their applications.	5	3	Understand
		(OR)			
4.		Explain Centrifugal Casting process with neat sketch. Mention applications, advantages and limitations of the process.	10	2	Analyse
		UNIT-III			
5.	a	Distinguish TIG and MIG welding processes	5	3	Understand
	b	Explain the principle of Spot welding with suitable diagram.	5	3	Understand
		(OR)			
6.		Suggest and explain a suitable welding method to join rails at remote area with neat sketch. Also mention merits and demerits of the method.	10	3	Analyse
		UNIT-IV			
7.	a	Differentiate between hot and cold working processes.	5	4	Understand
	b	A strip with a cross section of 150X4.5 mm is being rolled with 20% reduction of area using 450 mm diameter rolls. Determine the angle subtended by the deformation zone at the roll centre?	5	4	Apply
		(OR)			
8.	a	Explain the principle of hydrostatic extrusion with sketch. Also mention its applications.	5	4	Understand
	b	Explain wire drawing operation with a neat sketch.	5	4	Understand
		UNIT-V			
9.	a	What are the basic forging operations and explain any two of them with suitable sketch.	5	5	Understand
	b	Distinguish between blanking and piercing operation.	5	5	Understand
		(OR)			
10.		Discuss about the following with neat sketches: (i) Smith forging (ii) Press forging (iii) drop forging	10	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

AR20

CODE: 20ECT206 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech.II Semester Regular Examinations, July-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.	a	Explain the generation of AM Wave using Square law modulator	5	CO1	L2
	b	A carrier frequency of 16k Hz is modulated by audio frequency range from 300 to 2700. What will be the range of upper and lower side side	5	CO1	L4
		(OR)			
2.	a	Explain the demodulation of AM Wave using Square law detector.	5	CO1	L2
	b	The AM wave $10[1+0.5\cos(2\pi 500t)]\cos(2\pi 10^6 t)$ is demodulated by an envelope detector. Find the time constant and the resistor if capacitor used is 100pF.	5	CO1	L4
		UNIT-II			
3.	a	With a neat block diagram and relevant equations explain coherent detection of DSB-SC wave .	5	CO2	L3
	b	Explain VSB modulation? Mention the advantages and applications of VSB modulation.	5	CO2	L2
		(OR)			
4.	a	Derive the equations for SSB signal for which upper side band is retained .	5	CO2	L3
	b	With a neat block diagram, explain the BALANCED MODULATOR method for generating DSB-SC wave.	5	CO2	L3
		UNIT-III			
5.	a	Derive the expression for single - tone frequency modulation with necessary waveforms.	5	CO3	L4
	b	Explain the demodulation of FM signal with the help of balanced frequency discriminator.	5	CO3	L2
		(OR)			
6.	a	Explain the demodulation of FM signal with the help of PLL.	5	CO3	L2
	b	A 107.76MHz carrier signal is frequency modulated by a 7kHz sine wave. The resultant FM signal has a frequency deviation of 50kHz. Determine carrier swing, highest & lowest frequencies of frequency modulated signal, and modulation index of FM wave.	5	CO3	L4

UNIT-IV

7.	a	Explain about sensitivity, selectivity and fidelity.	5	CO4	L2
	b	Explain AM transmitter with the help of block diagram	5	CO4	L1
		(OR)			
8.	a	Draw block diagram of Super-heterodyne AM receiver and explain function of each block.	5	CO4	L3
	b	Explain FM transmitter with the help of block diagram.	5	CO4	L2

UNIT-V

9.	a	Draw the wave forms of pulse modulations and explain briefly	5	CO5	L3
	b	Explain the generation of PAM signal.	5	CO5	L2
		(OR)			
10.		Explain the generation and demodulation of PPM with the help of block diagram and hence discuss its spectral characteristics	10	CO5	L3

UNIT-VI

11.	a	Derive for Signal to Noise Ratio and Figure of Merit in AM receivers.	5	CO6	L4
	b	A sinusoidal signal with a frequency of 5 kHz is transmitted through a channel after modulation. The peak amplitude of the unmodulated carrier is 2V. The modulation index is μ 0.5. The two sided power spectral density of noise is 10^{-5}W/Hz. Find in dB i) signal to noise ratio at the input of the receiver ii) signal to noise ratio at the output of the receiver	5	CO6	L4
		(OR)			
12.	a	What is time division multiplexing? Explain the need of guard band.	5	CO6	L2
	b	Derive the expression for Figure of merit of Coherent reception of DSB modulated wave	5	CO6	L4

AR20

CODE: 20CST206 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech.II Semester Regular Examinations, July, 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.	Compare conventional file processing system vs DBMS.	5M	CO1	K2
	b.	Draw and explain the three-level architecture of database system.	5M	CO1	K2
		(OR)			
2.		With a neat sketch explain detailed database system structure.	10M	CO1	K2
		UNIT-II			
3.		Consider your College Sports Day. Identify entities, attributes, relations etc. Draw ER diagram for college sports day	10M	CO2	K4
		(OR)			
4.		Explain relational algebra various Join operations with neat example	10M	CO2	K3
		UNIT-III			
5.		Explain various DDL commands in SQL with example	10M	CO3	K3
		(OR)			
6.	a.	With the help of an example explain INSERT, UPDATE and DELETE operations in SQL.	5M	CO3	K3
	b.	Explain the advantages of NULL values used in SQL.	5M	CO3	K2
		UNIT-IV			
7	a	Explain Multivalued dependency with an example.	5M	CO4	K3
	b	Explain 3NF with example	5M	CO4	K3
		(OR)			
8.		Consider the below table. Identify, which normal form(s) are satisfied and apply remaining normalisation upto BCNF.	10M	CO4	K4

Stud_rollno	proj_id	stud_name	age	proj_name	address	dept_id	dept_name

		UNIT-V			
9.		Explain in detail about Log based recovery methods with examples	10M	CO5	K3
		(OR)			
10.		What is locking protocol? And explain various locking protocols in DBMS.	10M	CO5	K4
		UNIT-VI			
11.		Discuss in detail about primary and secondary indexes.	10M	CO6	K3
		(OR)			
12.	a.	By considering relevant example for students, show insertion and deletion operations on a B+Tree.	5M	CO6	K4
	b.	Explain in detail about indexed accessing methods	5M	CO6	K2

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AR18

CODE: 18CET209 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

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

STRUCTURAL ANALYSIS-I

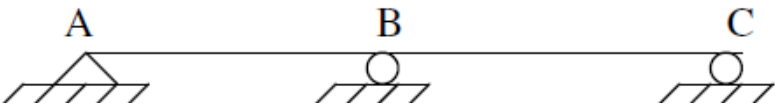
(Civil Engineering)

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

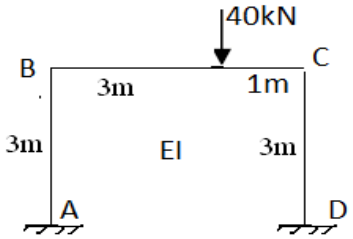
Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. a) For the beam shown in Fig. what is the static and kinematic indeterminacy for inclined point load acting anywhere on the beam 6M

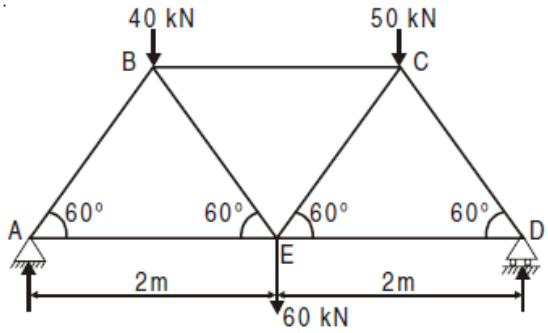


b) For the frame shown in Fig. what is the static and kinematic indeterminacy 6M



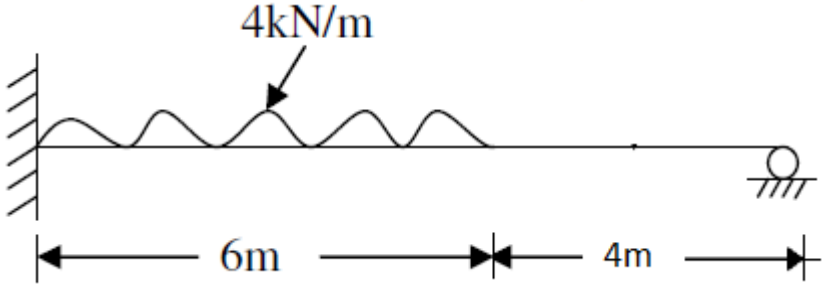
(OR)

2. Determine the forces in all the members of the truss shown in Figure and indicate the magnitude and nature of forces on the diagram of the truss. All inclined members are at 60° to horizontal and length of each member is 2 m. 12M



UNIT-II

3. A propped cantilever beam is shown in figure. Calculate the prop Reaction and also draw the BM and SF diagrams. 12M

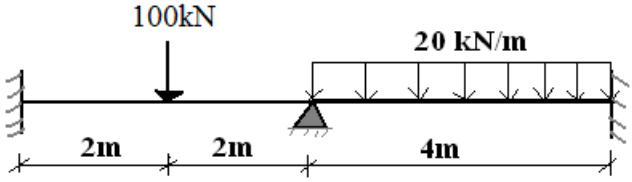


(OR)

4. A fixed beam of span 6 m is subjected a UDL of 20 kN/m on the left half of the span and a point load of 50 kN at the middle of the right half of the span. Draw the S.F. and B.M. diagrams. 12M

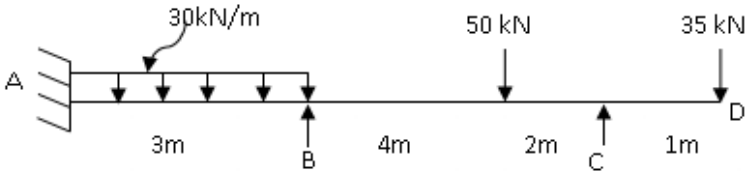
UNIT-III

5. For the beam loaded as shown in **Figure,** Draw shear force and bending moment diagrams. Use Clapeyron's theorem of three moments 12M



(OR)

6. Analyse the continuous beam shown in Figure and draw the Bending Moment diagram and Shear Force Diagram. Use Clapeyron's theorem of three moments 12M



UNIT-IV

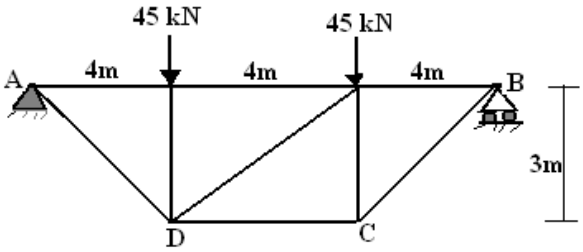
7. Find the deflection at free end and strain energy of a cantilever beam of span 3m carrying a load of 20kN if E=200GPa and I = 6 x $10^{-4}m^4$. 12M

(OR)

8. Discuss about the Castigliano's first and second theorems with suitable examples 12M

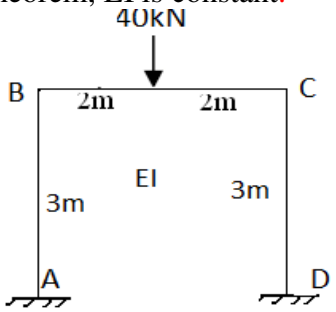
UNIT-V

9. The steel truss supported as shown in Fig. if the truss is so designed that, under the given loading, all tension members are stressed to 100 N/mm^2 and all compression members to 80 N/mm^2, find the vertical deflection of the point C take E= 200Gpa. 12M



(OR)

10. Determine the deflection under the point load for the frame loaded as shown in figure using Castigliano's theorem, EI is constant. 12M



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AR18

CODE: 18EET207 SET-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B. Tech II Semester Supplementary Examinations, July-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)	Write any 6 differences between Squirrel cage and Slip ring Induction Motor.	6M
	b)	Explain briefly about the concept of Rotating magnetic field in a Induction motor.	6M
		(OR)	
2.	a)	Explain the constructional features of Squirrel cage and Slip ring Induction motor.	6M
	b)	Explain the equivalent circuit of a Induction motor with a neat sketch.	6M

UNIT-II

3.	a)	Explain briefly about the different types of starting methods in a Induction Motor.	12 M
		(OR)	
4.	a)	Explain briefly the working principle of an Induction Generator	6M
	b)	What is No-load test of a induction motor. Explain briefly.	6M

UNIT-III

5.		Explain the phenomena of armature reaction when an alternator is delivering a load Current at i) purely lagging power factor ii) unity power factor iii)purely leading power Factor	12M
		(OR)	
6.		Explain briefly about Pitch factor and Distribution factor in a Alternator.	12M

UNIT-IV

7.	a)	Explain briefly about blondel two reaction theory in synchronous machine.	6M
	b)	Write the applications of synchronous generator and synchronous motor.	6M
		(OR)	
8.		Explain briefly about parallel operation of alternators. Also write the advantages .	12M

UNIT-V

9.	a)	Explain briefly the working principle of Synchronous motor with a neat sketch.	6M
	b)	What is the necessity of connecting a synchronous condenser in a network.	6M
		(OR)	
10.	a)	Explain briefly the different starting methods of Synchronous motor.	8M
	b)	Write the applications of synchronous motor.	4M

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AR18

CODE: 18MET206 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B. Tech II Semester Supplementary Examinations, July-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. Explain any four types of patterns and their applications	6M
	b)	Explain the shell moulding process. Write merits and demerits of the process	6M
		(OR)	
2.	a)	Explain different types of casting defects and their remedies	6M
	b)	Calculate the size of a cylindrical riser (height and diameter equal) necessary to feed a steel slab casting 25X25X5 cm with a side riser casting poured horizontally into the mould	6M

UNIT-II

3.		Explain GAS welding principle , advantages, disadvantages and applications of the process with neat sketch	12M
		(OR)	
4.		Explain TIG welding principle , advantages, disadvantages and applications of the process with neat sketch.	12M

UNIT-III

5.	a)	Differentiate hot working and cold working processes	6M
	b)	In a rolling process, sheet of 25mm thickness is rolled to 20mm thickness. Roll is of diameter 600mm and it rotates at 100rpm.Find the roll strip contact length.	6M
		(OR)	
6.	a)	Show by schematic sketches the process of forward and backward extrusion?	6M
	b)	Explain the tube drawing process	6M

UNIT-IV

7.	a)	Define forging. Explain the upsetting forging operation and its applications	6M
	b)	Describe the drop forging operation and its applications	6M
		(OR)	
8.	a)	Describe clearances for die and punch (i) Blanking (ii) Punching	6M
	b)	Describe Embossing and coining	6M

UNIT-V

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

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AR18

CODE: 18ECT208 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B. Tech II Semester Supplementary Examinations, July,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 how the amplitude modulation can be expressed in time domain and frequency domain?	6M
	b)	Explain the generation of AM wave by using switching modulation technique.	6M
		(OR)	
2.	a)	Explain the reasons for doing modulation. Mention its advantages.	6M
	b)	A carrier wave of frequency 10MHz and peak value of 10V is amplitude modulated by 5KHz sine wave of amplitude 6V. Determine the modulation index and draw the one sided spectrum of modulated wave.	6M

UNIT-II

3.	a)	Explain about frequency discrimination method of SSB-SC wave generation and mention its advantages and disadvantages.	8M
	b)	An AM transmitter of 1KW power is fully modulated. Calculate the power transmitted if it is transmitted as SSB.	4M
		(OR)	
4.	a)	A 400W carrier is modulated on a depth of 75%, Calculate the total power in the modulated wave in the following forms of AM. a) Double Sideband with Full Carrier (DSBFC) b) Double Sideband Suppressed Carrier (DSBSC)	6M
	b)	Explain the need of VSB modulation and why VSB system is widely used for TV broadcasting? Explain.	6M

UNIT-III

5.	a)	Obtain the expression for angle modulation from fundamentals.	6M
	b)	Explain the demodulation of FM signal with the help of PLL.	6M
		(OR)	
6.	a)	Explain the process of detection of FM wave using frequency discriminator method.	6M
	b)	Explain frequency division multiplexing technique with neat diagram.	6M

UNIT-IV

7.	a)	Explicate the working of AM transmitter using high level modulation with a neat block diagram.	6M
	b)	Clarify the operation of FM receiver with neat block diagram.	6M
		(OR)	
8.	a)	Elucidate the working of variable reactance type FM transmitter with a neat block diagram.	6M
	b)	Explicate the operation of Tuned Radio Frequency Receiver (TRF) with neat block diagram.	6M

UNIT-V

9.	a)	Draw the circuit of PPM demodulator and explain the operation.	6M
	b)	Discuss the noise performance of AM system using envelope detection.	6M
		(OR)	
10.	a)	Compare PAM, PWM and PPM pulse modulation techniques.	6M
	b)	Distinguish between pre-emphasis and de-emphasis.	6M

AR18

CODE: 18CST207 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

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

DATABASE MANAGEMENT SYSTEMS

(Common to CSE AND 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)	Explain in detail the structure of the DBMS system.	6M
	b)	Differentiate Database Systems versus file Systems.	6M
		(OR)	
2.	a)	Discuss different Data Models.	6M
	b)	Discuss i. Data Abstraction ii. Instances and Schemas	6M

UNIT-II

3.	a)	Explain the additional features of ER model.	6M
	b)	Discuss briefly Entities, Attributes and Entity sets.	6M
		(OR)	
4.	a)	Explain the following relational algebra operations? i. Select ii.Project	6M
	b)	Explain strong and weak entity sets.	6M

UNIT-III

5.	a)	Explain in detail Set- Comparison Operators.	6M
	b)	Explain Nested Queries with example.	6M
		(OR)	
6.	a)	Explain about NULL values with example.	6M
	b)	Explain Aggregative Operators.	6M

UNIT-IV

7.	a)	Define 1NF, 2NF & 3NF with suitable example and illustrate how an unnormalized table is converted to 2NF.	6M
	b)	Define and describe functional dependency.	6M
		(OR)	
8.	a)	What is serializabiity? Explain the types with examples.	6M
	b)	Discuss the types of locks used in concurrency control?	6M

UNIT-V

9.	a)	Discuss briefly Shadow Paging.	6M
	b)	Explain Log – Based Recovery.	6M
		(OR)	
10.	a)	Explain Primary and Secondary Indexes.	6M
	b)	Explain Hash Based Indexing and Tree based Indexing	6M

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AR16

CODE: 16CE2008 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

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

STRUCTURAL ANALYSIS-I

(Civil Engineering)

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

Answer ONE Question from each Unit

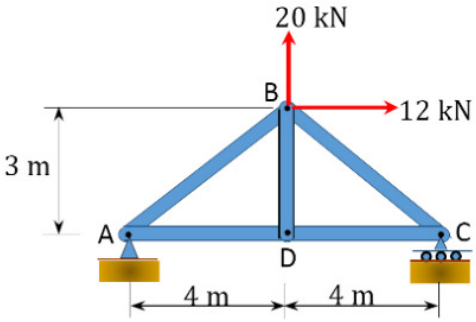
All Questions Carry Equal Marks

All parts of the Question must be answered at one place

UNIT-I

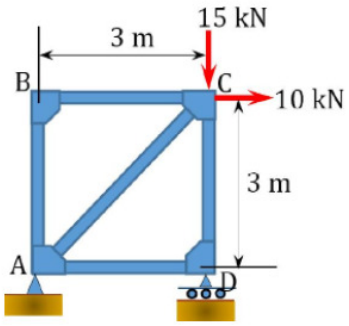
1. a) Define static and kinematic indeterminacy of structures 4 M

   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

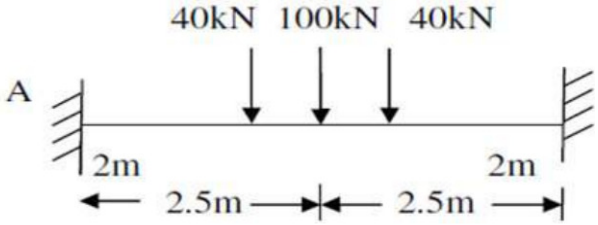


UNIT-II

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

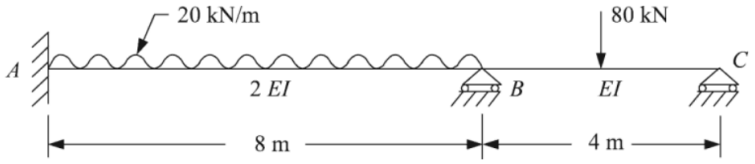
(OR)

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



UNIT-III

5. Analyse the continuous beam shown below using three moment equation. Draw SFD and BMD. 14M



(OR)

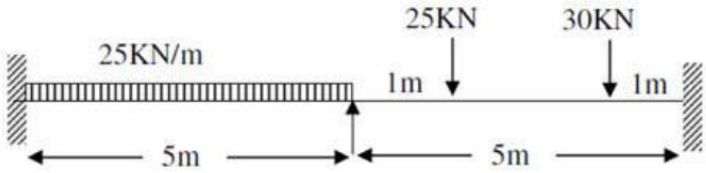
6. A continuous beam ABC is simply supported at A and C and continuous over support B with AB = 5m and BC = 6m. A uniformly distributed load of 12kN/m is acting over the beam. The moment of inertia is I throughout the span. Analyse the continuous beam using theorem of three moments and draw S.F.D and 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, July, 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)	Derive Max torque and starting torque equations of a 3-phase induction motor	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)	Explain any one speed control method of a 3-phase induction motor	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) Explain the 'ZPF' method of finding voltage regulation of an alternator. 7M
   b) Explain two reaction theory for a salient pole synchronous machine 7M

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) Explain the operation of synchronous motor as synchronous condenser 7M
    b) Explain various starting methods of synchronous motor 7M

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AR16

CODE: 16ME2010 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, July, 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	6M

UNIT-II

3.	a)	Briefly explain the difference 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 fuel 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)	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.	8M
	b)	Explain any one dynamo meter for measurement of frictional power of IC engine.	6M

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 power required to compress the air.	6M

AR16

CODE: 16EC2007 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

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

ANALOG COMMUNICATIONS

(Electronics and Communication 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 Amplitude modulation. Explain about Amplitude Modulation with the help of waveforms and write necessary expressions	7M
	b)	Explain the demodulation of AM wave using envelope detector with necessary block diagram and waveforms	7M

(OR)

2.	a)	Explain the generation of AM wave using square law modulator with neat block diagram and waveforms	7M
	b)	An audio frequency signal m(t)= 10Sin [2π (500)t] is used to amplitude modulate a carrier of c(t) = 50sin[5π10^5t]. Find (i) Modulation index (ii) Side band frequencies (iii) Bandwidth required (iv) Total power delivered to the load of 600Ω.	7M

UNIT-II

3.	a)	Compare AM, DSBSC and SSBSC modulation schemes in terms of power, bandwidth and applications	7M
	b)	Explain the generation of DSBSC wave using ring modulator with necessary block diagram and waveforms	7M

(OR)

4.	a)	Explain the generation of SSB signal using phase discriminator method with neat block diagram	7M
	b)	What is DSBSC modulation? Draw the waveforms for DSBSC signal both in time and frequency domain.	7M

UNIT-III

5.	a)	Distinguish between Narrow Band FM and Wide Band FM.	7M
	b)	Draw the block diagram of an Indirect method of FM generation and explain its operation	7M

(OR)

6.	a)	The equation for an FM wave is given by: S(t) = 10 Cos[2π * 10^8 t + 5 Sin (2π * 10^3 t)] Volts. Find (i) Carrier frequency, (ii) Modulating signal frequency, (iii) modulation index and (iv) Power dissipation across 100 ohm	7M
	b)	Explain the working principle of Time Division Multiplexing system With neat block diagram	7M

UNIT-IV

7.	a)	Illustrate the principle of operation of a Tuned radio frequency receiver	7M
	b)	Explain about AM transmitter with block diagram	7M

(OR)

8.	a)	Discuss the following i) Effect of feedback on performance of AM Transmitter ii) frequency stability in FM Transmitter	6M
	b)	Explain the principle of operation of a super heterodyne radio receiver.	8M

UNIT-V

9.	a)	What is Pulse modulation? List various types of Pulse modulation	5M
	b)	Derive the expression for the figure of merit in AM receivers using envelope detection	9M

(OR)

10.	a)	Explain the generation of Pulse Amplitude Modulation(PAM) with neat block diagram and necessary waveforms	7M
	b)	What is Pre-emphasis & de-emphasis? Explain in detail	7M

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AR16

CODE: 16CS2008 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, July, 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

AR13

CODE: 13CE2008 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

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

STRUCTURAL ANALYSIS-I

(Civil Engineering)

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

PART-A

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

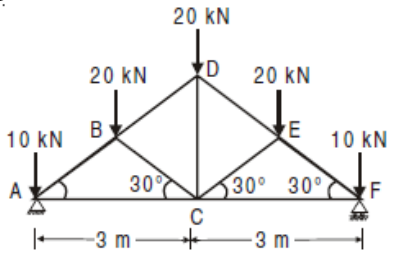
1. a) State clearly the difference between a perfect frame and imperfect frame
   b) How would you distinguish between a deficient frame and redundant frame
   c) State Eddy's theorem
   d) Differentiate between beam and arch
   e) What do you mean by the continuous beam?
   f) Show different types of continuous beams with sketches
   g) Explain with figures the difference of fixed beam and continuous beam
   h) A fixed beam carries a central point load. Draw shear force
   i) Define influence lines
   j) What will be the shape of ILD curve for vertical reaction

PART-B

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

UNIT-I

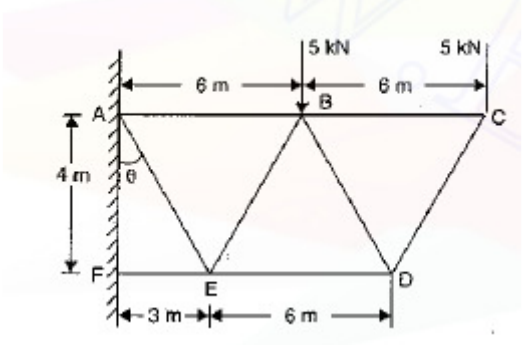
2. Find the magnitude and nature of the forces in the members BD, BC and CF of the loaded truss shown in Fig



12

(OR)

3. A cantilever truss is loaded as shown in fig. find the forces in the member



12

UNIT-II

4. A parabolic 3 hinged arch carries a UDL of 25 kN/m on the left half of the span. It has a span of 16 m and a central rise of 3 m. Determine the resultant reaction at supports. Find also the bending moment, normal thrust and radial shear at a section 4 m from left support — 12

(OR)

5. A circular (three hinged) arch of span 25 m with a central rise of 5 m is hinged at the crown and the end supports. It carries a point load of 100 kN at 6 m from the left support. Calculate — 12
   a. The reaction at the supports and
   b. Moment at 5 m from the left support

UNIT-III

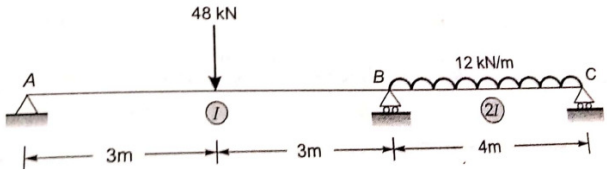
6. A Propped cantilever beam of span L subjected to Uniformly distributed load *w* per unit length over its entire span from its fixed support. Determine the prop reaction. Draw Shear force and Bending moment Diagram — 12

(OR)

7. A fixed beam carries a point load W at mid span of the beam. Draw Shear force and bending moment — 12

UNIT-IV

8. Analyze the continuous beam as shown fig by using three moment equation. Draw SFD and BMD — 12



(OR)

9. Derive the Clayperon's theorem of three moments — 12

UNIT-V

10. Two-wheel loads of 15kN and 5kN, at a fixed distance apart of 2m, crosses a beam of 10m span. Draw the influence line for bending moment and shear force for a point 4m from the left abutment, and find the maximum bending moment and shear force at that point. — 12

(OR)

11. Five-point loads 10kN, 12kN, 16kN, 16kN and 20kN spaced equally at a distance of 5m roll over a simply supported beam of span 80m from left to right with 20kN load leading. Calculate the position and magnitude of Maximum bending which may occur any where on the beam. — 12

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AR13

CODE: 13EE2011 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.TECH II SEM SUPPLEMENTARY EXAMINATIONS, JULY, 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) Write the e.m.f. equation of a transformer?
   b) What will happen if the primary of a transformer is connected to dc supply?
   c) Why SC test of a transformer is conducted on HV Side?
   d) Write the Comparison between Core & Shell Type Transformers?
   e) State the conditions for satisfactory parallel operation of transformers?
   f) What are the various types of starters used for induction motor?
   g) What is cogging of an induction motor?
   h) What is the condition for maximum starting torque?
   i) Draw the torque speed-characteristics of an induction motor?
   j) List any two speed control methods w.r.t. stator side.

PART-B

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

UNIT-I

2. Obtain the equivalent circuit of a transformer when referred to primary from the Fundamentals. 12M

(OR)

3. A transformer has a maximum efficiency of 98% at 15kVA at u.p.f. During the day, it is loaded as follows: 12M
   10 Hours - 3kW at 0.6 p.f.
   5 Hours - 10kW at 0.8p.f.
   5 Hours - 18kW at 0.9 p.f.
   4 Hours - no load
   Determine the all-day efficiency of the transformer?

UNIT-II

4. a) A 1-phase, 10kVA, 2500/250V transformer gave the following test results: 6M
   OC test: 250V, 0.8A, 50W (LV side)
   SC test: 60V, 3A, 45 W (HV side)
   (i) Calculate the efficiency at 1/4 of the full load, 0.8 p.f. lagging
   (ii) Calculate the kVA output at which maximum efficiency occurs
   b) Two 1-phase transformers with equal turns have impedances of (0.5 + j3) Ω and (0.6 + j10) Ω with respect to the secondary. If they operate in parallel, determine how they will share a total load of 100 kW at p.f. 0.8 lagging? 6M

(OR)

5. a) Explain how a two winding transformer can be converted into an auto-transformer. 6M
   b) Three single-phase transformers, connected in delta-delta, supply a balanced load 3-phase load of 1500kW at 4400V at 0.8 p.f lagging. The transformers are supplied from 3-phase mains at 11000V. Find the currents in the windings of each transformer. 6M

UNIT-III

6. a) A 3-phase, 460V, 100HP, 60Hz, 4-pole induction machine delivers rated output power at a slip of 0.05. Determine (i) Synchronous speed, (ii) Motor speed, (iii) Frequency of the rotor circuit, and (iv) Slip speed 6M
   b) Derive the condition of max. torque of induction motor. Also explain factors affecting max. torque condition? 6M

(OR)

7. Show that when a 3-phase supply is given to the stator winding of induction motor, it produces a rotating magnetic field of constant magnitude and rotating at synchronous speed. 12M

UNIT-IV

8. a) Explain Auto-transformer starter with neat sketch and obtain the expression for starting torque in terms of full load torque? 6M
   b) It is desired to install a 3-phase cage induction motor restricting the maximum line current drawn from a 400 V 3-phase supply to 120 A. If the starting current is 6 times full load current, what is the maximum permissible full load kVA of the motor when 6M
   i) It is directly connected to the mains
   ii). It is connected through an auto-transformer with a tapping of 60%

(OR)

9. Explain the procedure to conduct blocked rotor test and no-load test on induction motor. 12M

UNIT-V

10. Explain the following schemes of speed control with neat sketches 12M
    i) Cascade method
    ii) Rotor resistance control

(OR)

11. a) What is the necessity of starter in 3-phase induction motor? State the difference between DOL starter and Star-delta starter? 6M
    b) What is an induction generator? Explain the operating principle. 6M

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