SREE SAKTHI ENGINEERING COLLEGE
TNEA Admission Code 2673
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Web : www.sreesakthi.edu.in
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2.2.1

THE INSTITUTION ASSESSES THE LEARNING LEVELS OF THE STUDENTS AND ORGANIZES SPECIAL PROGRAMMES FOR ADVANCED LEARNERS AND SLOW LEARNERS

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DEAPERTMENT OF CIVIL ENGINEERING

2.2.1	**COACHING CLASS FOR FAILURE STUDENT**
	COACHING CLASS FOR FAILURE STUDENT ATTENDANCE
	SAMPLE ASSIGNMENT
	CIRCULAR
	ADVANCED LEARNERS NPTEL COURSE DETAILS
	NPTEL COURSE DEATSILS

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Dr R. PRABHU
PRINCIPAL,
SAKTHI ENGINEERING COL
COIMBATORE-641 104

SREE SAKTHI ENGINEERING COLLEGE,KARAAMADAI,COIMBATORE

DEPARTMENT OF CIVI ENGINEERING COACHING CLASS FOR FAILURE STUDENT

II YEAR CIVIL

S.NO	NAME	NM	CTP	SOM II	AHE	CT	SM
1	SUDHAKAR S	09-06-2022(AN)					
2	NITHEES KAMBATTAND	09-06-2022(AN)			10-06.2022 (AN)		
3	PARTHIBAN J			13-06-2022(AN)			
4	SARAN KUMAR J			13-06-2022(AN)			
5	S SHARMILA			13-06-2022(AN)	10-06.2022 (AN)		
6	SENTHILKUMAR V						

III YEAR CIVIL

S.NO	NAME	DSSE	SA II	IE	HE	WWE
1	Akash A		06-06-2022			
2	Pranav S	19-06-22(FN)				
3	Jeyabalan R	19-06-22(FN)	06-06-2022			
4	Aravind K K	19-06-22(FN)			22-06-2022	15-06-22(FN)
5	Mohammed salman R	19-06-22(FN)				

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SREE SAKTHI ENGINEERING COLLEGE,
KARAAMADAI,COIMBATORE

DEPARTMENT OF CIVIL ENGINEERING

COACHING CLASS FOR FAILURE STUDENT ATTENDANCE

S.No	Name of the Student	Class	Subject & Date			
			09.06.22	10.06.22	13.06.23	
			NM	AHE	SOM I	
1	SUDHAKAR S	II CIVIL	P			
2	NITHEES KAMBATTAN D		P		P	
3	PARTHIBAN J			P		
4	SARAN KUMAR J			P		
5	S SHARMILA			P	P	
6	SENTHILKUMAR V					

S.No	Name of the Student	Class	Subject & Date			
			19.6.22	6.6.22	22.06.232	15.06.22
			DSSE	SA II	HE	WWE
1	Akash A	III CIVIL		P		
2	Pranav S		P			
3	Jeyabalan R		P	P		
4	Aravind K K		P		P	P
5	Mohammed salman R		P			

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HOD

ASSIGNMENT-II

Name : S. Sharmila

Reg. No : 713620103311

Subject : Applied Hydraulic Engineering

Sub. Code : CE 8403

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1. Write the Case Study Gradually varied flow Classification:-

Abstract

The first major irrigation project was created during Egypt's first dynamic close to 3100 BC this consist of channels that direction the flood water. The channel make possible to transport water from main source such as a natural river of a reservior to the field where the Crops are located making possible the irrigation and growth of Crops that feed our nation. Therefore it is very important for the agriculturist to know the water level at different section on the irrigation Channel for this the agriculture had to know So knowledge to hydrodynamics, therefore is important to develop a protection tool that Can be used by Compare to the ones obtained by the flow across hydraulics structure. after performing the flow two Case of study on the proposed algorithms and a Commercial programs, the results demonstrations that the proposed algorithms is more accurate. determine the flow depth which the Commercial

tested. Therefore the Simultaneous solution algorithms accomplish the requirements of being an easy tool to use for user. Also for a simple irrigation system the simultaneous solution algorithms is recommended to use instead of the commercial programs.

Keywords:-

Irrigation, channel, weir, Algorithms.

Introduction

The first major irrigation project was created during Egypt's first Dynasty close to 3100 BC. this consist of channels that directed the flood water from the nine rivers into a lake, the channel made possible to transport water from a main source such as a natural river or a reservior at different section on the discharge of water that a specific point will provide water level at an open channel. Therefore it is important to develop a paracterial tool that can be used any person with basic knowledge on a computer which can determine the gradually varied flow on open channel.

Theoritical Background:-

Gradually varied flow

In real like project channel c/s and bottom slopes are not constant distance in natural channels and these are varied in Construction channels to suit the existing topographical condition for economic reasons therefore gradually varied flow will exist gradually varied flow occurs when small Since the analysis of GVF usually for long channels. The gradually varied flow equation of a prismatic channel having no lateral.

1. The slope of the channel bottom is small. This slope maybe assumed small if less than 5°. Therefore flow depth measured vertically or normally to the bottom are approximately the same.

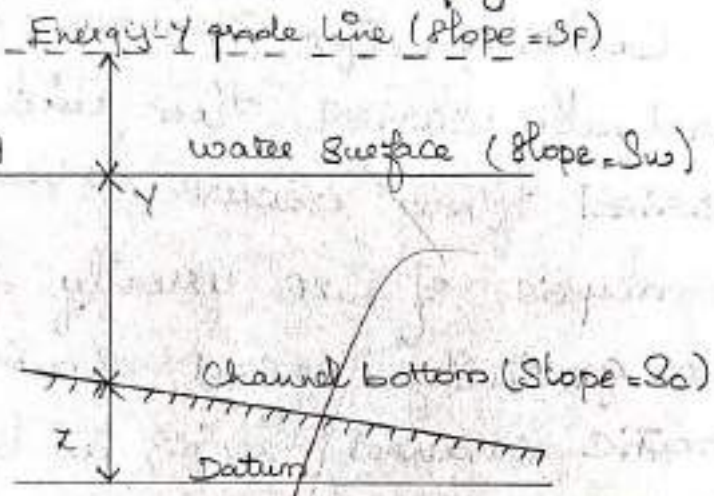
2. The channel prismatic channel and there is no lateral in flow. A prismatic channel to a channel that its occurs cross section and bottom slope does not changes with distance. If the channel has different c/s or bottom slope maybe divided into piecewise prismatic channel.

3. The pressure distribution is hydrostatic at all channel section this because straight, parallel.

4. The head loss maybe determined by using the equation for head losses in uniform flow.

5. If we use a define scratch to derive equation for GVF we will obtains the total head at a channel section.

$$H = z + Y + \alpha v^2/2g$$



After performing the differentiation a both sides with respect to the distance (x) and rearranging the terms produces the following equation. which respresents the variation of the flow depth with repect to the distance along the channel.

$$\frac{dy}{dx} = \frac{S_o - S_f}{y - \frac{\alpha T Q^2}{g A^3}}$$

Direct Step Method :-

The direct step method can be expressed into forms, depending the variable that you want to determine. This method can determined the distance b/w two selection flow depends are being at the upstream section and the other this method is only suitable for prismatic channels. because the same a/s geometric relationship are used for all these section the depth flow (or) and the specific energy (E_0) at the downstream section will be known, therefore section and also the distance b/w two selected flow depth. where $\bar{S}e$ is know as the average of the energy slope b/w two section and its expressed on the eqn.

$$\Delta L = H - \frac{1}{2}\left[(S_{f_1} + S_{f_2})(y_2 - y_1)\right]$$

$$Se = n^2 V^2 / QR^{4/3}$$

$$H_2 = H_1 - \frac{1}{2}\left[\frac{\alpha_2 Q_2}{2g A_2^2} + \frac{1}{2} S_{f_2}(y_2 - y_1)\right]$$

$$+ Z_2 - H_1 + \frac{1}{2} S_{f_1}(y_2 - y_1) = 0$$

$$\frac{df}{dy_2} = 1 - \frac{\alpha_2 Q_2}{g A_2^3}\frac{dA_2}{dy_2} + \frac{1}{2}(y_2 - y_1)\frac{d}{dy_2}\left(\frac{Q^2 n^2}{C_2^2 A_2^2 R_2^{1/3}}\right)$$

Results and analysis:-

The results for the first Case of Study are presented on the following table. The table #3 shows the resulting obtained by the Simulated Solution algorithms where the reach #1 represent the first section of that channel. For the flow depth at each on both channels, to the at each reach program for the to determine the distance is 100m and for sum of all the distance is the reaches, where the theoritical distance is 1000m.

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CIRCULAR

Department of Civil Engineering

All students are requested to meet their corresponding mentor counselor on 27/07/2021 by 4.40 pm.

S.No	Batch	Reg No	Tutor name	Sign
1	2018-2021	713618103001-713618103002	**Ms K Deepika**	
	2019-2022	713619103001-713619103003		
	2020-2023	713620103001-713620103004		
2	2018-2021	713618103003-713618103004	**Mrs D Santhini**	
	2019-2022	713619103004-713619103006		
	2020-2023	713620103303-713620103306		
3	2018-2021	713618103005-713618103006	**Mr G Aravind**	
	2019-2022	713619103007-713619103009		
	2020-2023	713620103307-713620103309		
4	2018-2021	713618103008-713618103010	**Mr D Santhoshkumar**	
	2019-2022	713619103301-713619103303		
	2020-2023	713620103302		
5	2018-2021	713618103302-713618103303	**Kirubha**	
	2019-2022	713619103304-713619103701		
	2020-2023	713620103310-713620103311		

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COACHING CLASS FOR FAILURE STUDENT

II YEAR CSE

S.NO	NAME	IOS	TOC	AI & ML	DBMS	ALGORITHM
1	GOKUL A.R	09-06-2023(AN)				
2	LINGESWAR M.S	09-06-2023(AN)				
3	KARTHI S		13-06-2023(AN)			
4	VARUN M		13-06-2023(AN)			
5	VENKATESH P		13-06-2023(AN)			
6	VARUN M					
7	KARTHI S					

III YEAR CSE

S.NO	NAME	IP	AI	MC	CD	DS
1	ABIVARNAN M		06-06-2023			
2	ASHOK KUMAR K	19-06-23(FN)				
3	BAVADHARUN M	19-06-23(FN)	06-06-2023			
4	DEVENDARAN S	19-06-23(FN)			22-06-2023	15-06-23(FN)
5	PRAVEENTHAN S	19-06-23(FN)				
6	SANTHOSH KUMAR A	19-06-23(FN)				
7	SHIJU S	19-06-23(FN)	06-06-2023			
8	SURIYA R	19-06-23(FN)	06-06-2023		22-06-2023	
9	NAVEEN KANNAN S	19-06-23(FN)	06-06-2023			
10	VASANTH G		06-06-2023			
11	SUJITHA M		06-06-2023			
12	RAMALAKSHMI M		06-06-2023			

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COACHING CLASS FOR FAILURE STUDENT ATTENDANCE

S.No	Name of the Student	Class	Subject & Date			
			05.06.23	09.06.23	13.06.23	
			DBMS	IOS	TOC	
1	GOKUL A.R	II CSE	P	P	P	
2	LINGESWAR M.S		P	P	P	
3	KARTHI S		P	AB	P	
4	VARUN M		P	P	P	
5	VENKATESH P		P	P	P	

S.No	Name of the Student	Class	Subject & Date			
			06.06.23	15.06.23	19.06.23	22.06.23
			AI	DS	IP	CD
1	ABIVARNAN M	III CSE	P	P	P	P
2	ASHOK KUMAR K		P	P	P	P
3	BAVADHARUN M		P	P	P	P
4	DEVENDARAN S		P	AB	P	P
5	PRAVEENTHAN S		P	P	P	P
6	SANTHOSH KUMAR A		P	P	P	P
7	SHIJU S		P	P	P	P
8	SURIYA R		P	P	P	P
9	NAVEEN KANNAN S		P	P	P	P
10	VASANTH G		P	P	AB	P
11	SUJITHA M		P	P	P	P
12	RAMALAKSHMI M		P	P	P	P

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ASSIGNMENT-1

Name : Suriya R.

Reg NO : 713620104029 .

Sub : Artificial Intelligence

Subcode : CS8691.

Part-A

Define Relational Agent?

- A system is rational if it does the right things given its knowledge.
- the agent's prior knowledge of the environment
- the performance measure that defines the criterion of success.

List down the Characteristics of Intelligent Agents.

- Learning / Reasoning
- Reactivity
- Autonomy.
- Goal - oriented.
- Co-operation.

State the concept of Rationality.

Rationality means that an AI agent is assumed to take account of available information and knowledge potential risk and benefits, and to act rationally in choosing the action.

What are the functionality of the function?

An agent function is a map from the percept sequence to action.

Eg. Agent, a software agent has keep state content received network package which act as screen and dis on the screen.

---

5 Define basic agent program?

An agent is an independent program or entity that interact with its environment by its surrounding via mean acting through actuators or effectors.

Part-B:

1) Define the task environment and their characteristic to the following problem.

i) Travelling salesman problem
ii) 8-purple problem.
iii) tower of Hanoi
iv) chess

8-puzzle Problem.

7	2	4
5		6
8	3	1

1	2	3
4	5	6
7	8	

State: A state description specifies the location of each element.

Initial state: Any state can be designated as the state.

Part - A

1. Define Rational Agent ?

→ A System is rational if it does the right thing, Given its knows.
→ the Agent is knowledge of the Environment
→ the Performance measure that define the criterion of success.
→ the Actions that the Agent can Perform.

2. List down the characteristics of Intelligent Agents ?

→ Learning / Reasoning
→ Penticity
→ Autonomy
→ Goal - oriented
→ Corperation

3. State the Concept of Rationality ?

→ Rationality means that an AI agent is assumed to take account of available information and the remained Potential cost and benefits, and to act consistently in Chasing the best action.

4. What are the functionality of the Agent function ?

→ An agent function is a map from the Percept Sequence in an action.

SREE SAKTHI ENGINEERING COLLEGE, KARAMADAI – 641104

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REF: SSEC/CSE/MENTOR CIR/1/2021-2022/ODD JULY 26, 2021

CIRCULAR

Department of Computer Science and Engineering

All students are requested to meet their corresponding mentor counselor on 26/07/2021 by 4.40 pm.

S.No	Batch	Reg No	Tutor name	Sign
1	2018-2021	713618104001-713618104023	**M. RAMAKRISHNAN**	
2	2018-2021	713618104024-713618104028	**R.DEEPIKA**	
	2019-2022	713619104024-713619104306		
3	2019-2022	713619104001-713619104023	**L.SRINIVASAN**	
4	2020-2023	713620104001-713620104029	**M.MADAVAKRISHNAN**	
5	2020-2023	713620104030-713620104054	**S.YUVALATHA**	

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SPECIAL COACHING CLASS CIRCULAR

Department of Mechanical Engineering

09.09.2021

Below mentioned students are asked to attend the special coaching class as per below time table from SEPT 2021 onwards by 4.40pm to 5.40pm.

Time Table

Month Sept 2021 & Oct 2021(Every week)

YEAR	MON	TUES	WED	THU	FRI	SAT
II YEAR/MECH	ME8391 ETD	CE8394 FMM	ME8351 MFT I	MA8353 TPDE	EE8353 EDC	-
II YEAR/MECH	ME8593-DME	ME854 DOM	ME8595 TE II	ME851 M&M	ORO551 RES	-
III YEAR/MECH	ME8791 MTS	ME872 PPE	ME8793 PPCE	ME803 UCMP	OML751 TOM	ME8099 ROB

Students Name list

II YEAR	IIIYEAR	IV YEAR
B.PRAVEEN	R.AKASH	P.AKASH
R.YUVARAJ	M.GOPINATH	P.BALA
A.DHANUSH	S.KARTHIKEYAN	DIANEL CHRISTOBAR
I.KAVIN KUMAR	P.SACRATES	C.KAMALEESWARAN
P.VELRAJ	B.SANJAY	B.MANIKANDAN
S.BALAVIGNESH	M.SATHISHPANDI	G.SRIRAM
S.BHARATH	R.SURYA	S.TAMILARASAN
G.PRASANNA	M.SURYAKANTH	THASARATHARAJAN
G.VICKY	S.G.SENTHILBALAJI	R.VALLARASU
C.SANTHOSH	P.JAYARAJ	S.VIJAYARAJ
	S.G.SENTHILBALAJI	

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SREE SAKTHI ENGINEERING COLLEGE, COIMBATORE -641 104

BRANCH: MECHANICAL ENGINEERING

ACADEMIC YEAR: 2021-2022 (ODD)

YEAR/SEMESTER: III / VI

SECTION: A

BATCH: 2020 - 2024

SUBJECT CODE/NAME: CE 8391 - EMM

SPECIAL COACHING CLASS ATTENDANCE SHEET

S.NO	ROLL NO 7136210	NAME	MONTH	9	9	10	10	10	10
			DATE	20	27	4	11	18	25
1	008	B. Praveen		/	/	/	/	/	/
2	12	K. Yuvaraj		/	/	/	/	/	/
3	326	S. Balavignesh		/	/	/	/	/	/
4	329	S. Bharath		/	/	/	/	/	/
5	338	A. Dhanush		/	/	/	/	/	/
6	329	I. kavin kumar		/	A	/	/	/	/
7	347	G. Prasanna		/	/	A	/	/	/
8	357	C. Santhosh		/	/	/	/	/	/
9	363	P. Velraj		/	/	/	/	A	/
10	365	G. Vikky		/	/	/	/	/	A
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25									

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PRINCIPAL

Dr R. PRABHU

PRINCIPAL,

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BRANCH: MECHANICAL ENGINEERING

ACADEMIC YEAR: 2021-2022 (ODD)

YEAR/ SEMESTER: III / V | SECTION: A | BATCH: 2019-2023

SUBJECT CODE / NAME: ME8593 - DME

SPECIAL COACHING CLASS ATTENDANCE SHEET

S.NO	ROLL NO	NAME	MONTH	SEP	SEP	SEP	OCT	OCT	OCT
			DATE	13	20	27	4	11	18
1	19MEE	Akash. R		/	/	a	/	/	/
2	005	Gopinath. M		/	/	/	/	a	/
3	010	Karthikeyan. S		/	/	/	a	/	/
4	016	Socrates. P		/	a	/	/	/	/
5	018	Sanjay. B		/	/	/	a	a	a
6	022	Sathish Pandi. M		/	/	a	a	a	a
7	025	Surya. R		/	/	/	a	a	a
8	026	Surya kanth. M		/	/	/	/	/	/
9	301	Jayaraj. P		/	/	/	/	a	/
10	304	Prasanth kumar P		/	a	/	/	/	/
11	305	Senthil Balaji. M		/	/	/	/	a	/
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Dr R. PRABHU

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SREE SAKTHI ENGINEERING COLLEGE, COIMBATORE -641 104

BRANCH: MECHANICAL ENGINEERING

ACADEMIC YEAR: 2021-2022 (ODD)

YEAR/ SEMESTER: IV/VII | SECTION: A | BATCH: 2018-2023

SUBJECT CODE/ NAME: ME8793 - PPCE

SPECIAL COACHING CLASS ATTENDANCE SHEET

S.NO	ROLL NO	NAME	MONTH	sept	sept	sept	oct	oct	oct
			DATE	13	20	27	04	11	18
1	8ME002	Akash. P		/	/	/	/	/	/
2	007	Bala. P		/	/	/	A	A	/
3	010	Dianel Christober		/	/	A	/	/	/
4	015	Kamaleeswaran. C		/	A	A	/	/	/
5	017	Manikandan. R		/	/	/	/	/	/
6	038	SRIRAM. G		/	/	/	/	A	A
7	042	Tamilarasan. J		/	/	/	/	/	/
8	043	Thaiyarkharajan		/	A	A	/	/	/
9	045	Vallarasu. R		/	A	A	/	/	/
10	048	Vijayaraj. J		/	/	/	A	A	/
11									
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STAFF INCHARGE

PRINCIPAL

Dr R. PRABHU

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SREE SAKTHI ENGINEERING COLLEGE
TNEA Admission Code 2073
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Web : www.sreesakthi.edu.in
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ASSIGNMENT

Subject Code & Title :	ME 8593- DESIGN OF MACHINE ELEMENTS		
Branch :	Mechanical Engineering	Semester :	V
Assignment Date:	13.09.2021	Max Marks:	50

PART A (Answer all the Questions)

1.	What is spring index?
2.	How does the function of flywheel differ from that of governor?
3.	List out the stresses induced in flywheel rims?
4.	What is turning moment diagram?
5.	What are the forces acting on connecting rod?

PART B (Answer all the following)

1.	Design a leaf spring for the following specifications for a truck. Assume FOS = 2. Maximum load on springs = 100 Kn No .of springs = 4 Material of springs = Cr Va steel (σ_u = 1380 MPa and E = 206 x 10^3 MPa) Span of spring = 1000 mm Width of central band = 150 mm Permissible deflection = 100 mm Assume 2 full length leaves and 6 graduated leaves.
2.	Design a CI flywheel for a four stroke engine developing 150 Kw at 200 r.p.m.Calculate the mean diameter of the flywheel if the hoop stress not to exceed 4 Mpa.Total fluctuation of speed is to be 4% of the mean speed.Workdone during the power stroke may be assumed to be 1.5 times the average work done during the cycle. Density of the cast iron is 7200 Kg/m^3.
3.	Design a closed coil helical spring subjected to a tensile load of magnitude varying from 2500 N to 3000 N and the axial deflection of spring for this range of load is 6.5 mm.Design the spring,taking the spring index as 6 and safe shear stress for material equal to 465 MPa.

FACULTY I/C

HOD

Assignment

Name - R. Akash

Register no - 713621114002

Sub - Design & Manufacturing Automation

Sub code - ME8792

PART-A

3. What is Spring index?

The ratio of mean (or) Pitch diameter of wire for the the Spring is Called Spring index.

4. How does the function of flywheel differ from that of governor?

A governor regulates the mean speed of an engine when there are variations in the mean loads. It automatically controls the supply of working fluid to engine with the varying load condition and keeps the mean speed within the limits.

5. List out the of stresses Induced in flywheel rims?

* Tensile Stress due to Centrifugal force
* Bending Stress due to torque.
* Stress due to bolt tension

4. What are the external forces acting on a Connecting rod?

The combined effect of a) load on the piston due to the gas pressure and due to inertia of the reciprocating parts, and b) The friction of piston rings, Piston rod and Cross head.

1. Inertia of the Connecting rod.
2. The friction force in the gudgeon and Crank pin bearings

5. What is turning moment diagram?

It is the graphical representation of the turning moment (or) Crank effort for various position of the Crank.

PART- B

Design a leaf spring for the following specifications.

Total load = 140kN ; No of springs supporting the load = 4

Maximum no of leaves = 10, Span of the spring = 1000mm ;

Permissible deflection = 80mm. Take young's modulus, E = 200kN/mm² and allowable stress in spring material as 600 MPa.

GIVEN DATA:

Total load = 140kN

No of springs = 4

n = 10

2L = 1000mm ⇒ L = 500mm

δ = 80mm

E = 200 kN/mm² = 200 × 10³ N/mm

σ = 600 MPa = 600 N/mm²

TO FIND:

Design a leaf spring.

SOLUTION:

$$\text{Load } W = \frac{\text{Total load}}{\text{No of Spring}} = \frac{140}{4} = 35\,kN$$

$$W = 35/2 = 17.5\,kN = 17500\,N$$

Bending Stress (σ)

$$600 = \frac{6.W.L}{n.b.t^2} = \frac{6 \times 17\,500 \times 500}{n.b.t^2} = \frac{52.5 \times 10^6}{n.b.t^2}$$

$$n.b.t^2 = 52.5 \times 10^6 / 600 = 87.5 \times 10^3$$

Deflection of the Spring (σ)

$$80 = \frac{6\,W.L^3}{n.E.b.t^3} = \frac{6 \times 17.500\,(500)^3}{n \times 200 \times 10^3 \times b \times t^3} = \frac{65.6 \times 10^6}{n.b.t^3}$$

$$n.b.t^3 = 65.6 \times 10^6 / 80 = 0.82 \times 10^6$$

Dividing (ii) and (i)

$$\frac{n.b.t^3}{n.b.t^2} = \frac{0.82 \times 10^6}{87.5 \times 10^3} = t \; ; = 9.37 = 10\,mm$$

ξ(i) $b = \frac{87.5 \times 10^3}{n.t^2} = \frac{87.5 \times 10^3}{10(10)^2} = 87.5\,mm$

ξ(ii) $b = \frac{0.82 \times 10^6}{n.t^3} = \frac{0.82 \times 10^6}{10(10)^3} = 82\,mm.$

Taking the larger no of values

$b = 87.5$ (or) $90\,mm$

Design a helical Compression Spring to sustain an axial load of 3KN. The deflection is 60mm. Spring index is 6. The Shear stress is not to exceed 300 MPa Rigidity modulus for material is 81 GPa.

GIVEN DATA:

Axial load $P = 3KN = 3\times10^3 N$

Deflection $y = 60mm$

Spring index $C = 6$

Shear Stress $\tau = 300MPa = 300N/mm^2$

Rigidity Modulus $G = 81GPa = 81\times10^3 N/mm^2$

TO FIND:

DESIGN a helical Compression Spring.

SOLUTION:

$$T = \pi/16 \times \tau \times d^3$$

$$C = \frac{D}{d} \qquad D = C\times d = 6\times d$$

$$R = \frac{D}{2}$$

$$\pi/16 \times \tau \times d^3 = W \times R$$

$$\pi/16 \times 300 \times d^3 = (3\times10^3)\times 6\times \frac{d}{2}$$

$$58.90 \times d^3 = (3\times10^3)\times 3\times d$$

$$58.90\times d^2 = 9000$$

$$d^2 = \frac{9000}{58.90}$$

$d = 12.36mm$

STEP 1: CALCULATION OF DIAMETER

$d = 12.36mm$

Outside diameter $D_o = D + d$; $D_o = 74.16 + 12.36$

$D_o = 86.52mm$ $\quad D = 6 \times d$; $6 \times 12.36 = 74.16$

Inside diameter $D_i = D - d = 74.16 - 12.36$

$D_i = 61.8mm$

STEP 2: Total no of turn's (n')

$$y = \frac{8 \times P \times C^3 \times n'}{G \times d} \quad ; \quad 60 = \frac{8 \times (3 \times 10^3) \times 6^3 \times n'}{(81 \times 10^3) \times 12.36}$$

$$n' = \frac{(81 \times 10^3) \times 12.36 \times 60}{8 \times (3 \times 10^3) \times 6^3} \quad ; \quad n' = 11.98 \ (or) \ 12$$

ASSUME SQUARE AND GROUND CONDITION:

$n = n' + 2$

$n = 12 + 2$

$n = 14$

Step 3: Free length

$$L.F = [(n' \times d) + y_{max} + (0.15 \times y_{max})]$$
$$= [(12) \times 12.36 + 60 + 0.15(60)]$$

$$\boxed{L.F = 217.32 mm}$$

Step 4: Pitch.

$$P = \frac{LF}{n-1} = \frac{217.32}{14-1} \Rightarrow \boxed{P = 16.71}$$

5. Design of helical Compression spring with Variable loading: A helical Compression Spring is made of oil tempered Carbon Steel is Subjected to a load varies from 400 N to 1000 N. The Spring index is 6. The design factor of Safety is 1.25 if the yield Stress in Shear is 350 MPa. Determine i) Size of the Spring wire
ii) Diameter of the Spring
iii) No of turns of the Spring
iv) Free length.

If the Compression of the Spring at the max. load is 30 mm. The modulus of rigidity for the Spring material may be taken as 80 KN/mm².

GIVEN DATA:

Helical Compression Spring

Max load P_{max} = 1000 N

Mini load P_{min} = 400 N

Spring index C = 6

Factor of Safety n = 1.25

Yield Stress τ_y = 770 MPa = 770 N/mm²

Endurance Shear τ_{-1} = 350 MPa = 350 N/mm²

TO FIND:

Size of the Spring Wire (or) d

Mean Coil diameter (D), Inside diameter Di and and Outside (D_o)

No of turns (n)

Free length (L.F)

GIVEN:

deflection y = 30 mm

Modulus of rigidity G = 80 MPa = 80 N/mm²

SOLUTION:

FROM PSG DB PAGE NO : 7.102

Amplitude Shear stress

$$\tau_a = \frac{8 \times k_s \times P_a \times c}{\pi \times d^2}$$

Curvature factor $K_s = \frac{1+1}{2 \times c}$; $\frac{1+1}{2 \times 6} = 1.083$

Amplitude load

$$P_a = \frac{P_{max} - P_{min}}{2} = \frac{1000 - 400}{2} = 300\ N$$

$$\tau_a = \frac{8 \times 1.083 \times 300 \times 6}{\pi \times d^2}$$

$$\boxed{\tau_a = \frac{4.96 \times 10^3}{d^2}}$$

MEAN SHEAR STRESS (τ_m)

$$\tau_m = \frac{8 \times k_{sh} \times P_m \times c}{\pi \times d^2}$$

$$P_m = \frac{P_{max} + P_{min}}{2} = \frac{1000 + 400}{2}$$

$$P_m = 700\ N$$

Wahl Stress factor:

$$K_{sh} = \frac{4c-1}{4c-4} + \frac{0.615}{c}$$

$$= \frac{4(6)-1}{4(6)-4} + \frac{0.615}{6}$$

$$K_{sh} = 1.25$$

$$T_m = \frac{8 \times 1.25 \times 700 \times 6}{\pi \times d^2} = \frac{13.36 \times 10^3}{d^2}$$

Consider factor of Safety

$$\frac{1}{n} = \frac{T_m - T_a}{T_y} + \frac{2 T_a}{T - 1}$$

$$\frac{1}{1.25} = \frac{\frac{13.36 \times 10^3}{d^2} - \frac{4.96 \times 10^3}{d^2}}{770} + \frac{2 \times 4.96 \times 10^3}{\frac{d^2}{350}}$$

$$0.8 = \frac{10.90}{d^2} + \frac{28.34}{d^2}$$

$$0.8 = \frac{39.24}{d^2}$$

$$d = \sqrt{\frac{39.24}{0.8}} = 7 \text{ mm}$$

Diameter of the Spring wire $d = 7$ mm

Mean Coil diameter : (D)

$$C = \frac{D}{d} \; ; \quad 6 = \frac{D}{7} \; ; \quad D = 6 \times 7 \quad \boxed{D = 42 \text{ mm}}$$

Inside diameter

$$D_i = D - d = 42 - 7 = 35 \text{ mm}$$

Outer diameter

$$D_o = D + d = 42 + 7 = 49 \text{ mm}$$

Total no of turns

$$y = \frac{\delta \times p_{max} \times C^3 \times n'}{G \times d^4} = \frac{8 \times 700 \times 6^3 \times n'}{80 \times 10^3 \times 7^4}$$

$$n' = \frac{30 \times (80 \times 10^3) \times 7^4}{8 \times 700 \times 6^3}$$

$$\boxed{n' = 4.76} \Rightarrow 5.$$

ASSUME SQUARE AND GROUND CONDITION :

Total no of coils 'n'

$$n = n' + 2 \; ; \quad 5 + 2$$

$$n = 7$$

FREE LENGTH :

$L.F = (n' \times d + \delta_{max}) + 0.15\,(\delta_{max})$

$L.F = [(5 \times 7) + (30 + 0.15\,(30)]$

$L.F = 69.5mm$

PITCH :

$$P = \frac{L.F}{n-1} = \frac{69.5}{7.1} = 11.58mm$$

RESULT:

Diameter of spring wire $d = 7mm$

Mean Coil diameter $D = 42mm$

Inside diameter $Di = 35mm$

Outside diameter $Do = 49mm$

No of turns $n = 7$

Free length $L.F = 69.5mm$

Pitch $P = 11.58mm$.

B. SUDHARSAN

III RD YR ECE

DTSP

ASSIGNMENT-I

9/10

20/10/21

ASSIGNMENT-I

Discrete time Signal Processing (EC 8553)

P-A

1. Define DFT Pair

DFT is defined only for Consequences of finite length since $x(e^{jw})$ is Continuous and periodic, DFT is obtained by sampling one period of time fourier transform at a finite number of frequency points. DFT plays an important role in the implementation of many digital processing algorithm Apart from determining the frequency content of a signal. DFT is used to perform linear filtering operations in the frequency domain

2. What is middle factor ? What are its properties

Twiddle form

Let me define a terms

$$W_N = e^{-j2\pi/N} \quad -①$$

Which is Known as middle term

The Magnitude of middle factor W_N is eqn ①. is given

$$|W_n| = |e^{-j2\pi/N}| = |\cos\frac{2\pi}{N} - j\sin\frac{2\pi}{N}|$$

and phase angle

Properties

$W^k = W^{\gamma \pm \frac{N}{2}}$

This is known as symmetry property or middle term

$W^k = W^{\gamma \pm N} = W^{\gamma \pm 2N} = \ldots$

this is known as Periodicity property or middle factor

3. Distinguish between DFT and DTFT

S.No	DFT	DTFT
1.	obtained by performing sampling operation in both the time and frequency domain	sampling is performed only in time domain
2.	Discrete frequency spectrum	Continuous function of ω

Compute the D.F.T of $x(n) = \delta(n - n_0)$

Sol: $x(n) = \delta(n - n_0)$

$$x(k) = \sum_{n=0}^{n-1} x(n) e^{\frac{-j 2\pi nk}{N}}$$

$$= \sum_{n=0}^{n-1} \delta(n - n_0) e^{\frac{-j 2\pi \pi_2 k}{N}}$$

$$x(k) = e^{\frac{-j 2\pi n_0 k}{N}} \quad \text{for } 0 \leq k \leq N-1$$

What is Zero padding ? What are the uses

Zero padding

Let the Sequence $x(n)$ has a length L. If we want to find the N-point DFT ($N > L$) of the sequence $x(n)$, we have to add $(N-L)$ zero's is the sequence $x(n)$. This is known as Zero padding

The uses of padding a sequence $x(n)$ has a length L we can get "better display" of the frequency Spectrum

* With two Zero padding the DFT can be used in linear filtering

Define circulation Convolution.

Let $x_1(n)$ and $x_2(n)$ are finite duration sequences both of length N with DFT's $X_1(K)$ and $X_2(K)$

If $X_3(K) = X_1(K)\, X_2(K)$, then the frequency Sequence $x_3(n)$ can be obtained by circular Convolution, defined as,

$$x_3(n) = \sum_{m=0}^{N-1} x_1(m)\, x_2((n-m))_N$$

1. Calculate the number of multiplications needed in the calculation of DFT and FFT with 64-point Sequence

The number of Complex multiplications required using direct Combination

$$N^2 = 64^2 = 4096$$

The number of Complex multiplications required using FFT is

$$\frac{N}{2}\log_2 N = \frac{64}{2}\log_2 64$$

$$= 32 \times \frac{\log 64}{\log 2} = 32 \times \frac{1.806}{0.301}$$

$$= 32 \times 6$$

$$= 192$$

Speed improvement factor $= \frac{4096}{192} = 21.33$

8. What are the applications of FFT algorithm ?

The applications of FFT algorithm include

(i) linear filtering

(ii) Correlation

(iii) Spectrum Analysis

9. What are the properties of butter Worth filters ?

* The Magnitude response of the Butterworth filter decreases monotonically as the frequency Ω increases from 0 to ∞

* The Magnitude response of the Butterworth filter closely approximates the ideal response as the order N increases

* The poles of the Butterworth filter lie on a circle

10. Give the equation for the order of N and cut - off frequency Ω_c of butterworth filter

The order of the filter

$$N = \frac{\log \sqrt{\frac{10^{0.1\alpha S} - 1}{10^{0.1\alpha P} - 1}}}{\log\left(\frac{\Omega S}{\Omega P}\right)}$$

where,

αS - Stop band attenuation at stop band frequency ΩS

αP - Pass band attenuation at pass band frequency ΩP

$$\Omega C = \frac{\Omega P}{(10^{0.1\alpha P} - 1)^{\frac{1}{2N}}}$$

P-8

Determine the 8-Point of the Sequence $x(n) = \{1, 1, 1, 1, 1, 1, 0, 0\}$

Sol:

gn. $x(n) = \{\underset{x(0)}{1}, \underset{x(1)}{1}, \underset{x(2)}{1}, \underset{x(3)}{1}, \underset{x(4)}{1}, \underset{x(5)}{1}, \underset{x(6)}{0}, \underset{x(7)}{0}\}$

We Know

DFT, $x(n) = \sum_{n=0}^{N-1} x(n)\, e^{-\frac{j2\pi nk}{N}}$, $k = 0, 1, \ldots N-1$

for $N = 8$

$$x(0) = \sum_{n=0}^{7} x(n)\, e^{0} = \sum_{n=0}^{7} x(n)$$

$$x(0) = x(0) + x(1) + x(2) + x(3) + x(4) + x(5) + x(6) + x(7)$$

$$= 1+1+1+1+1+1+0+0$$

$$x(0) = 6$$

When $k = 1$, $x(1) = \sum_{n=0}^{7} x(n)\, e^{-j\pi n/4}$

$$= x(0) + x(1) + x(2) + x(3) + x(4) + x(5) + x(6) + x$$

$$= x(0) + x(1)e^{-j\pi/4} + x(2)e^{-j\pi/2} + x(3)e^{-j3\pi/4} + x(4)e^{-j\pi}$$

$$+ x(5)e^{-j5\pi/4} + x(6)e^{-j3\pi/2} + x(7)e^{-j7\pi/4}$$

$$= 1 + e^{-j\pi/2} + e^{-j\pi} + e^{-j3\pi/2} + 1e^{-j2\pi} + 1e^{-j5\pi/2} + 0 + 0$$

$$= 1 - j - 1 + j + 1 - j$$

$$X(2) = 1 - j$$

When $k = 3$

$$X(3) = \sum_{n=0}^{7} x(n)\, e^{-j2n\pi/4}$$

$$= x(0) + x(1)e^{-j3\pi/4} + x(2)e^{-j3\pi/2} + x(3)e^{-j9\pi/4}$$

$$+ x(4)e^{-j3\pi} + x(5)e^{-j15\pi/4} + x(6)e^{-j9\pi/2} + x(7)e^{-j21\pi/4}$$

$$= 1 + 1e^{-j3\pi/4} + 1e^{-j3\pi/2} + 1e^{-j9\pi/4} + 1e^{-j3\pi} + 0 + 0 + 0$$

$$= 1 - 0.707 - j0.707 - j + 0.707 - j0.707$$

$$= 1 - 0.707 - j0.707$$

$$X(3) = 0.707 + j0.293$$

When $k = 4$

$$X(4) = \sum_{n=0}^{7} x(n)\, e^{-j4n\pi/4}$$

$$= x(0) + x(1)e^{-j\pi} + x(2)e^{-j2\pi} + x(3)e^{-j3\pi} + x(4)e^{-j4\pi}$$

$$+ x(5)e^{-j5\pi} + x(6)e^{-j6\pi} + x(7)e^{-j7\pi}$$

$$= 1 + 1e^{-j\pi} + 1e^{-j2\pi} + 1e^{-j3\pi} + 1e^{-j4\pi} + 1e^{-j5\pi} + 0 + 0$$

$$= 1 - 1 + 1 - 1 + 1 - 1 = 0$$

$$X(4) = 0$$

When $k=5$

$$X(5) = \sum_{n=0}^{7} e^{-j5\pi n/4}$$

$$= x(0) + x(1)e^{-j5\pi/4} + x(2)e^{-j5\pi/4} + x(3)e^{-j5\pi/4} + x(4)e^{-j5\pi} + x(5)e^{-j25\pi/4} + x(6)e^{-j15\pi/2} + x(7)e^{-j35\pi/4}$$

$$= 1 + 1e^{-j5\pi/4} + 1e^{-j5\pi/2} + 1e^{-j5\pi/4} + 1e^{-j5\pi} + 1e^{-j25\pi/4} + 0 + 0$$

$$= 1 - 0.707 + j0.707 - j + 0.707 + j0.707 - 1 + 0.707 - j0.707$$

$$X(5) = 0.707 - j0.293$$

When $k=6$

$$X(6) = \sum_{n=0}^{7} x(n)e^{-j3\pi n/4}$$

$$= x(0) + x(1)e^{-j3\pi/4} + x(2)e^{-j3\pi} + x(3)e^{-j4\pi/2} + x(4)e^{-j6\pi} + x(5)e^{-j15\pi/2} + x(6)e^{-j9\pi} + x(7)e^{-j12\pi/2}$$

$$= 1 + j - 1 - j + 1 + j$$

$$X(6) = 1 + j$$

When $k=7$

$$X(7) = \sum_{n=0}^{7} x(n)e^{-j7\pi n/4}$$

$$= x(0) + x(1)e^{-j7\pi/4} + x(2)e^{-j7\pi/2} + x(3)e^{-j21\pi/4} + x(4)e^{-j7\pi} + x(5)e^{-j35\pi/2} + x(6)e^{-j21\pi/2} + x(7)e^{-j49\pi/4}$$

$$= 1 + 1e^{-j7\pi/4} + 1e^{-j7\pi/2} + 1e^{-j21\pi/4} + 0 + 0 + 0 + 1e^{-j35\pi/4}$$

$$= 1 + 0.707 + j0.707 + j - 0.707 + j0.707 - 1 - 0.707 - j0.707$$

$$X(7) = -0.707 + j1.707$$

$$X[k] = \{6, -0.707 - j1.707, 1-j, 0.707 + j0.293, 0, 0.707 - j0.293, 1+j, -0.707 + j1.707\}$$

Perform linear convolution of finite duration sequences

$h(n) = \{1, 1, 2, 1\}$ and $x(n) = \{1, -1, 1, 2, 1, 0, 1, -4, 3, 2, 1, 0, 1, 1\}$

by (a) over lap add method (b) over lap save method

Sol:

Gn.

$h(n) = \{1, 1, 2, 1\}$ $M = 4$

$x(n) = \{1, -1, 1, 2, 1, 0, 1, -4, 3, 2, -1, 0, 1, 1\}$ $L = 14$

(a) over lap add method

$x(n) = \{1, -1, 1, 2, 1, 0, 1, -4, 3, 2, 1, 0, 1, 1\}$

$x_1(n) = \{1, -1, 1, 0, 0, 0\}$

$x_2(n) = \{2, -1, 0, 0, 0, 0\}$

$x_3(n) = \{1, -4, 3, 0, 0, 0\}$

$x_4(n) = \{2, 1, 0, 0, 0, 0\}$

$x_5(n) = \{1, 1, 0, 0, 0, 0\}$

$h(n) = \{1, 1, 2, 1, 0, 0\}$

$y_1(n) = x_1(n) \textcircled{N} h(n)$

$$\begin{bmatrix} 1 & 0 & 0 & 1 & 2 & 1 \\ 1 & 1 & 0 & 0 & 1 & 2 \\ 2 & 1 & 1 & 0 & 0 & 1 \\ 1 & 2 & 1 & 1 & 0 & 0 \\ 0 & 1 & 2 & 1 & 1 & 0 \\ 0 & 0 & 1 & 2 & 1 & 1 \end{bmatrix} \begin{bmatrix} 1 \\ -1 \\ 1 \\ 0 \\ 0 \\ 0 \end{bmatrix} = \begin{bmatrix} 1 \\ 0 \\ 2 \\ 0 \\ 1 \\ 1 \end{bmatrix}$$

$h(n)$ $x_1(n)$ $y_1(n)$

$y_2(n) = x_2(n) \textcircled{N} h(n)$

$h(n)$ $\quad x_2(n)$ $\quad y_2(n)$

$$\begin{bmatrix} 1 & 0 & 0 & 1 & 2 & 1 \\ 1 & 1 & 0 & 0 & 1 & 2 \\ 2 & 1 & 1 & 0 & 0 & 1 \\ 1 & 2 & 1 & 1 & 0 & 0 \\ 0 & 1 & 2 & 1 & 1 & 0 \\ 0 & 0 & 1 & 2 & 1 & 1 \end{bmatrix} \begin{bmatrix} 2 \\ 1 \\ 0 \\ 0 \\ 0 \\ 0 \end{bmatrix} = \begin{bmatrix} 2 \\ 3 \\ 5 \\ 4 \\ 1 \\ 0 \end{bmatrix}$$

$y_3(n) = x_3(n) \textcircled{N} h(n)$

$h(n)$ $\quad x_3(n)$ $\quad y_3(n)$

$$\begin{bmatrix} 1 & 0 & 0 & 1 & 2 & 1 \\ 1 & 1 & 0 & 0 & 1 & 2 \\ 2 & 1 & 1 & 0 & 0 & 1 \\ 1 & 2 & 1 & 1 & 0 & 0 \\ 0 & 1 & 2 & 1 & 1 & 0 \\ 0 & 0 & 1 & 2 & 1 & 1 \end{bmatrix} \begin{bmatrix} 2 \\ 1 \\ 0 \\ 0 \\ 0 \\ 0 \end{bmatrix} \begin{bmatrix} 2 \\ 3 \\ 5 \\ 4 \\ 1 \\ 0 \end{bmatrix}$$

$y_4(n) = x_4(n) \textcircled{N} h(n)$

$h(n)$ $\quad x_4(n)$ $\quad y_4(n)$

$$\begin{bmatrix} 1 & 0 & 0 & 1 & 2 & 1 \\ 1 & 1 & 0 & 0 & 1 & 2 \\ 2 & 1 & 1 & 0 & 0 & 1 \\ 1 & 2 & 1 & 1 & 0 & 0 \\ 0 & 1 & 2 & 1 & 1 & 0 \\ 0 & 0 & 1 & 2 & 1 & 1 \end{bmatrix} \begin{bmatrix} 1 \\ 1 \\ 0 \\ 0 \\ 0 \\ 0 \end{bmatrix} \begin{bmatrix} 1 \\ 2 \\ 3 \\ 3 \\ 1 \\ 0 \end{bmatrix}$$

$y(n) = 1 \quad 0 \quad 2 \quad 0 \quad 1 \quad 1$

$2 \quad 3 \quad 5 \quad 4 \quad 1 \quad 0$

$1 \quad -3 \quad 1 \quad -4 \quad 12 \quad 3$

$2 \quad 3 \quad 5 \quad 4$

12

$1 \quad 0 \quad 2 \quad 2 \quad 4 \quad 6 \quad 5 \quad -2 \quad 1 \quad -2 \quad 5 \quad 8 \quad 5 \quad 3 \quad 3$

$y(n) = \{1, 0, 2, 2, 4, 6, 5, -2, 1, -2, 5, 6, 5, 3, 3\}$

$l = 15$

$N = L + M - 1$

$N = 15 + 4 - 1$

$N = 19 - 1$

$N = 18$

b) over lap add method

$x(n) = \{1, -1, 1, 2, 1, 0, 1, -4, 3, 2, 1, 0, 1, 1\}$

$h(n) = \{1, 1, 2, 1\}$ $N = 4$

$x_1(n) = \{0, 0, 0, 1, -1, 1\}$

$x_2(n) = \{1, -1, 1, 2, 1, 0\}$

$x_3(n) = \{2, 1, 0, 1, -4, 3\}$

$x_4(n) = \{1, -4, 3, 2, 1, 0\}$

$x_5(n) = \{2, 1, 0, 1, 1, 0\}$

$h(n) = \{1, 1, 2, 1, 0, 0\}$

$y_1(n) = x_1(n) \textcircled{N} h_1(n)$

$h(n)$ $\quad x_1(n)$ $\quad y_1(n)$

$$\begin{bmatrix} 1 & 0 & 0 & 1 & 2 & 1 \\ 1 & 1 & 0 & 0 & 1 & 2 \\ 2 & 1 & 1 & 0 & 0 & 1 \\ 1 & 2 & 1 & 1 & 0 & 0 \\ 0 & 1 & 2 & 1 & 1 & 0 \\ 0 & 0 & 1 & 2 & 1 & 1 \end{bmatrix} \quad \begin{bmatrix} 0 \\ 0 \\ 0 \\ 1 \\ -1 \\ 1 \end{bmatrix} \quad \begin{bmatrix} 0 \\ 1 \\ 1 \\ 1 \\ 0 \\ 2 \end{bmatrix}$$

$y_2(n) = x_2(n) \textcircled{N} h(n)$

$h(n)$ $\quad x_2(n)$ $\quad y_2(n)$

$$\begin{bmatrix} 1 & 0 & 0 & 1 & 2 & 1 \\ 1 & 1 & 0 & 0 & 1 & 2 \\ 2 & 1 & 1 & 0 & 0 & 1 \\ 1 & 2 & 1 & 1 & 0 & 0 \\ 0 & 1 & 2 & 1 & 1 & 0 \\ 0 & 0 & 1 & 2 & 1 & 1 \end{bmatrix} \quad \begin{bmatrix} 1 \\ -1 \\ 1 \\ 2 \\ 1 \\ 0 \end{bmatrix} \quad \begin{bmatrix} 5 \\ 1 \\ 2 \\ 2 \\ 4 \\ 6 \end{bmatrix}$$

$y_3(n) = x_3(n) \textcircled{N} h(n)$

$$\begin{bmatrix} 1 & 0 & 0 & 1 & 2 & 1 \\ 1 & 1 & 0 & 0 & 1 & 2 \\ 2 & 1 & 1 & 0 & 0 & 1 \\ 1 & 2 & 1 & 1 & 0 & 0 \\ 0 & 1 & 2 & 1 & 1 & 0 \\ 0 & 0 & 1 & 2 & 1 & 1 \end{bmatrix} \quad \begin{bmatrix} 1 \\ -1 \\ 1 \\ 2 \\ 1 \\ 0 \end{bmatrix} \quad \begin{bmatrix} 5 \\ 1 \\ 2 \\ 2 \\ 4 \\ 6 \end{bmatrix}$$

$y_4(n) = x_4(n) \textcircled{N} h(n)$

$h(n)$ $\quad x_4(n)$ $\quad y_4(n)$

$$\begin{bmatrix} 1 & 0 & 0 & 1 & 2 & 1 \\ 1 & 1 & 0 & 0 & 1 & 2 \\ 2 & 1 & 1 & 0 & 0 & 1 \\ 1 & 2 & 1 & 1 & 0 & 0 \\ 0 & 1 & 2 & 1 & 1 & 0 \\ 0 & 0 & 1 & 2 & 1 & 1 \end{bmatrix} \quad \begin{bmatrix} 1 \\ -1 \\ 3 \\ 2 \\ 1 \\ 0 \end{bmatrix} \quad \begin{bmatrix} 5 \\ -2 \\ 1 \\ -2 \\ 5 \\ 2 \end{bmatrix}$$

$y_5(n) = x_5(n) \textcircled{N} h(n)$

$h(n)$

$$\begin{bmatrix} 1 & 0 & 0 & 1 & 2 & 1 \\ 1 & 1 & 0 & 0 & 1 & 2 \\ 2 & 1 & 1 & 0 & 0 & 1 \\ 1 & 2 & 1 & 1 & 0 & 0 \\ 0 & 1 & 2 & 1 & 1 & 0 \\ 0 & 0 & 1 & 2 & 1 & 1 \end{bmatrix} \quad \begin{bmatrix} 2 \\ 1 \\ 0 \\ 1 \\ 1 \\ 0 \end{bmatrix} \quad \begin{bmatrix} 5 \\ 4 \\ 5 \\ 5 \\ 3 \\ 3 \end{bmatrix}$$

$y_1(n) = [1 \quad 0 \quad 1 \quad 1 \quad 0 \quad 2]$

$y_2(n) = [5 \quad 1 \quad 2 \quad 2 \quad 4 \quad 6]$

$y_3(n) = [2 \quad 5 \quad 8 \quad 5 \quad -2 \quad 1]$

$y_4(n) = [5 \quad -2 \quad 1 \quad -2 \quad 5 \quad 8]$

$y_5(n) = [5 \quad 4 \quad 5 \quad 5 \quad 3 \quad 3]$

(m-1) discard

$y(n) = \{1, 0, 2, 2, 4, 6, 5, -2, 1, -2, 5, 8, 5, 8, 3\}$ $\quad N = 15$

$N = L + M - 1$

$= 15 + 4 - 1$

$= 19 - 1$

$N = 18$

3. Find the 8-Point DFT of {2, 1, 2, 1} using DIT-FFT. Draw the signal flow graph for N = 8 with intermediate values.

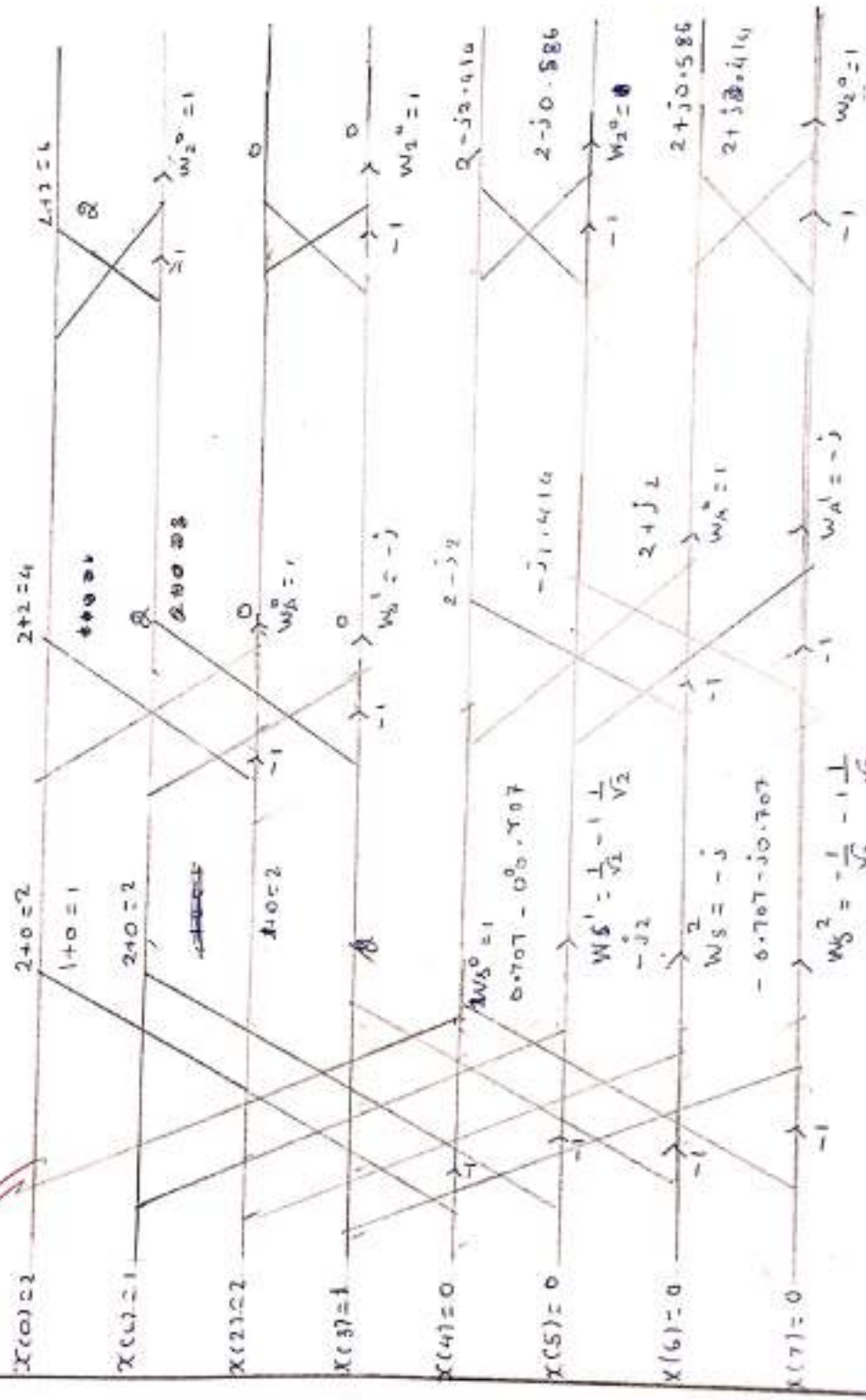
Note: appropriate zero's

Sol: $x(n) = \{2, 1, 2, 1\}$

$x(n) = \{x(0), x(1), x(2), x(3), 0, x(5), 0, 0, x(7)\}$

$= \{2, 1, 2, 1, 0, 0, 0, 0\}$

$N = 8 = 2^M \Rightarrow \boxed{M = 3}$ M → No. of stages

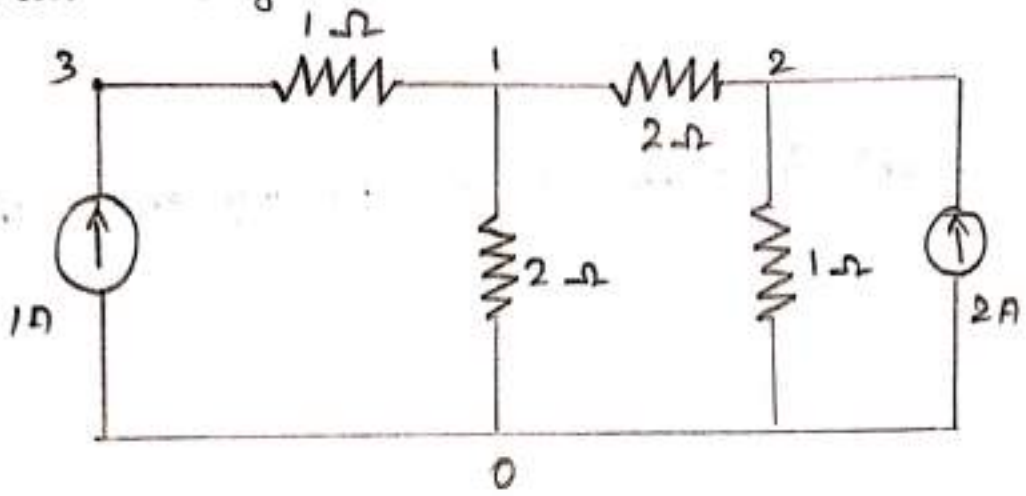


$X(K) = \{6, 2 - j3.414, 0, 2 + j0.586, 2, 2 - j0.586, 0, 2 + j3.414\}$

20/10/21

Assignment - 1

Determine the voltages 1 and 2 of the network by nodal analysis.



write the conductance matrix for the network, with nodes numbered as 1, 2, 4 as shown.

$g_{11} = 1 + 0.5 + 0.5 = 2$ mho $g_{33} = 1$ mho, $g_{12} = 0.5$ mho,

$g_{22} = 1 + 0.5 = 1.5$ mho, $g_{23} = 0$, $g_{13} = 1$ mho

$$\Delta = \begin{vmatrix} 2 & -0.5 & -1 \\ -0.5 & 1.5 & 0 \\ -1 & 0 & 1.0 \end{vmatrix} = 1.25$$

$$\Delta_1 = \begin{vmatrix} 0 & -0.5 & -1 \\ 2 & 1.5 & 0 \\ 1 & 0 & 1 \end{vmatrix} = 2.5$$

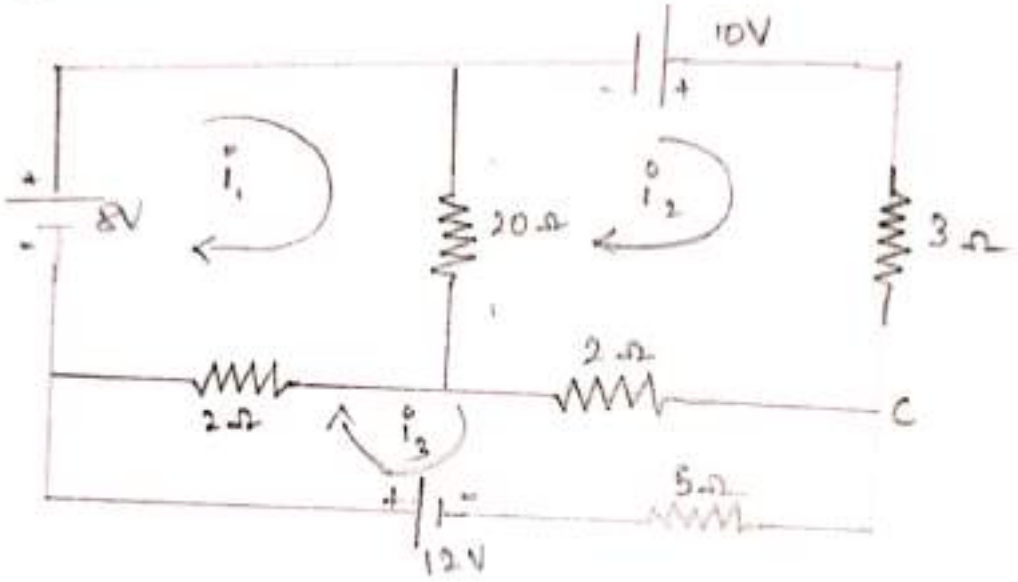
$$\Delta_2 = \begin{vmatrix} 2 & 0 & -1 \\ -0.5 & 2 & 0 \\ -1 & 1 & 1.0 \end{vmatrix} = 2.5$$

This gives $V_1 = \Delta_1/\Delta = 2.50/1.25 = 2$ Volts

And $V_2 = \Delta_2/\Delta = 2.50/1.25 = 2$ volts

It means that the 2-ohm resistor between nodes 1 and 2 does not carry current.

Determine current in 5 ohm resistor by any one method



$R_{11} = 3$, $R_{22} = 6$, $R_{33} = 9$, $R_{12} = 1$, $R_{23} = 2$, $R_{13} = 2$

Voltage source will be column matrix with entries serially as:

+8 volts, +10 volts, +12 Volts.

$$\Delta = \begin{vmatrix} 3 & -1 & -2 \\ -1 & 6 & -2 \\ -2 & -2 & 9 \end{vmatrix}$$

$= 3 \times (54-4) + 1(-9-4) - 2(2+12)$

$= 109$

$$\Delta_3 = \begin{vmatrix} 3 & -1 & 8 \\ -1 & 6 & 10 \\ -2 & -2 & 12 \end{vmatrix} = 396$$

$i_3 = \Delta_3 / \Delta$

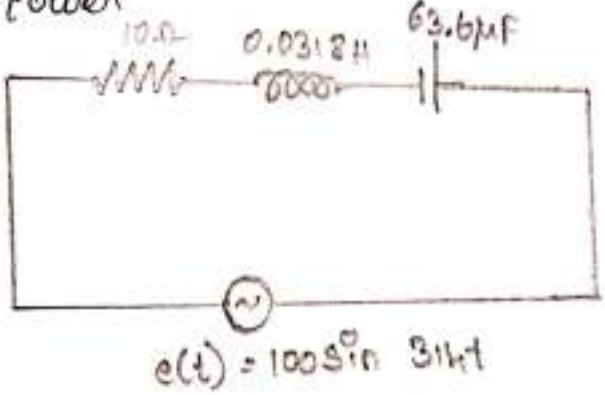
$= 396 / 109$

$= 3.633$ amp.

B). Alternatively, Thevenin's can be applied.

for this, detach the 5-ohm resistor from its position, Evaluate V_{TH} at the terminals x-y and de-activating the source, calculate the value of R_{TH}.

A voltage $e(t) = 100 \sin 314t$ is applied to a series circuit consisting of resistance of 10Ω inductance of 0.0318H and a capacitance of 63.6 μF. calculate, (i) expression for $i(t)$ ii). phase angle between voltage and current (iii) Power-factor iv). Active Power



Solution

$e(t) = E_m \sin \omega t$

$e(t) = 100 \sin 314t$

So, $E_m = 100V$ and $\omega = 314$

$$E_{rms} = \frac{E_m}{\sqrt{2}} = 70.71\ V$$

$$X_L = 2\pi f L = \omega L = (314 \times 0.0318) = 9.985\ \Omega$$

$$X_C = \frac{1}{2\pi f C} = \frac{1}{\omega C} = \frac{1}{(314 \times 63.6 \times 10^{-6})} = 50.07\ \Omega$$

Reactance, $X = X_L - X_C$

$= 40.085\ \Omega$

$$Z = \sqrt{R^2 + X^2}$$

$$= \sqrt{10^2 + 40.085^2}$$

$$= 41.31\ \Omega$$

$$I = I_{rms} = \frac{E_{rms}}{Z} = \frac{70.71}{41.31} = 1.711\ A$$

$$I_m = \sqrt{2}\ I_{rms} = \sqrt{2} \times 1.71 = 2.42\ A$$

$$\cos\phi = \frac{R}{Z} = \frac{10}{41.31} = 0.242$$

$$\phi \cos^{-1}(0.242) = 75.995^\circ$$

$$i(t) = I_m \sin(\omega t \pm \phi)$$

$$i(t) = I_m \sin(\omega t + \phi)$$

$$i(t) = 2.42 \sin(314t + 75.995^\circ)$$

Active power, $P = VI \cos\phi$

$$= V_{rms} I_{rms} \cos\phi$$

$$= (70.71) \times (1.711) \times (0.242)$$

Active Power, $P = 29.28\ W$

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ACADEMIC YEAR 2021-2022(EVEN SEMESTER)

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IIT MADRAS: https://nptel.ac.in/courses/117106108

UNIT -2

IIT KHARAGPUR: https://nptel.ac.in/courses/108105155

IIT DELHI: https://nptel.ac.in/courses/108102146

UNIT -3

IIT DELHI: https://nptel.ac.in/courses/108102095

IIT DELHI: https://nptel.ac.in/courses/108102112

IIT KHARAGPUR: https://nptel.ac.in/courses/108105158

UNIT -4

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IIT KHARAGPUR: https://nptel.ac.in/courses/108105153

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SLOW LEARNERS LIST

SI.NO	STUDENT NAME	SUBJECT CODE & NAME	STAFF INCHARGE
1	Ananth J	EC8553-Discrete Time Signal Processing EC8501-Digital Communication	S.Sasikala R.Anuradha
2	Gokulakrishnan C	EC8553-Discrete Time Signal Processing EC8501-Digital Communication EC8551-Communication Networks	S.Sasikala R.Anuradha Ramakrishnan
3.	Karthickshanakar S	EC8551-Communication Networks EC8552- Computer Architecture and Organization	Ramakrishnan Deepa
4.	Keerthana K	EC8553-Discrete Time Signal Processing EC8552- Computer Architecture and Organization	S.Sasikala Deepa
5.	Kiruthika B	EC8551-Communication Networks EC8501-Digital Communication	Ramakrishnan R.Anuradha
6.	Ramkumar M	EC8553-Discrete Time Signal Processing EC8552- Computer Architecture and Organization	S.Sasikala Deepa
7.	Roshanapriya S	EC8553-Discrete Time Signal Processing EC8501-Digital Communication EC8551-Communication Networks	S.Sasikala R.Anuradha Ramakrishnan

HOD

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REF: SSEC/CSE/CIR/01/2021-2022/ODD **Nov 13, 2021**

CIRCULAR

This is to inform the III Year remedial classes for the odd semester of 2021-2022 is to be held as per the schedule given below. Students are requested to utilize these classes.

S. NO	Date	Time	Subject / Code	Year / Sem
1	15-11-2021	4:00 PM-5:00 PM	EC8551-Communication Networks	III/V
2	16-11-2021	4:00 PM-5:00 PM	EC8501-Digital Communication	III/V
3	17-11-2021	4:00 PM-5:00 PM	EC8703-Medical Electronics	III/V
4	18-11-2021	4:00 PM-5:00 PM	OTL552-Digital Audio Engineering	III/V
5	19-11-2021	4:00 PM-5:00 PM	EC8552- Computer Architecture and Organization	III/V
6	20-11-2021	4:00 PM-5:00 PM	EC8553-Discrete Time Signal Processing	III/V

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Student Name: ANANTH J Tutor Name: P.Rangasamy Register Number: 713619106003

S.No	Date of Counseling	Reason for Counseling	Points Put forth by Students	Counseling given to Students	Student Sign	Tutor Sign	Remarks by HOD
1	17-11-2021	Low marks in internal	Family issue	To concentrate in studies			
2	25-01-2022	Lack of concentration in the class	Family issue	To concentrate in studies			

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DEPARTMENT OF CIVIL ENGINEERING

ADVANCED LEARNERS NPTEL COURSE LIST:

S.NO	CLASS	NAME OF THE STUDENT	COURSE NAME	URL
1	II CIVIL	P ANITHA	FLUID MECHANICS	https://www.youtube.com/watch?v=AdhWBb7j55c&list=PLwdnzlV3ogoV-ATGY2ptuLS9mwLFOJoDw&index=2
2.	III CIVIL	E SAKTHIVEL	STRUCTURAL ANALYSIS I	https://www.youtube.com/watch?v=oa5ojjGEUSw&list=PLUogGZJOiMtNOus85Tq1zNvg9EU3aJ8VO
3.		YADUKRISHNAN MI		
4.	IV CIVIL	ANJU R	RAILWAYS, AIRPORTS, DOCKS AND HARBOUR ENGINEERING	https://www.youtube.com/watch?v=o4OvDr4Ayb0&list=PLiEKlwwpk5F3B6JjpDQPA38DtOjynPe6l
5.		MARGARET SONA M		

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ONLINE NPTEL COURSE LINK:

S.NO	COURSE NAME	COURSE URL
1.	Fluid Mechanics	https://onlinecourses.nptel.ac.in/noc23_ce65/preview
2.	Principles Of Construction Management	https://onlinecourses.nptel.ac.in/noc23_ce62/preview
3.	Design Of Reinforced Concrete Structures	https://onlinecourses.nptel.ac.in/noc23_ce78/preview

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ACADEMIC YEAR-(2021-2022) EVEN SEMESTER

ADVANCED LEARNERS
NPTEL VIDEOS LINK

SUBJECT NAME: CONTROL SYSTEMS

IIT Bombay:

https://nptel.ac.in/courses/108/101/108101037/

IITDelhi:

https://nptel.ac.in/courses/108/102/108102043/

https://nptel.ac.in/courses/108/102/108102044/

IITMadras:

https://nptel.ac.in/courses/108/106/108106098/

ELECTRONICS DEVICES AND CIRCUITS

1) IIT Delhi:

https://nptel.ac.in/courses/115/102/115102103/

https://nptel.ac.in/courses/117/102/117102061/

2) IIT Madras:

https://nptel.ac.in/courses/117/106/117106091/

PROTECTION AND SWITCHGEAR

IIT Kharagpur:

https://nptel.ac.in/courses/108/105/108105167/

IITRoorkee:

https://nptel.ac.in/courses/108/107/108107167

IITBombay:

https://nptel.ac.in/courses/108/101/108101039/

POWER SYSTEM OPERATION AND CONTROL

3) IIT Kanpur:

https://nptel.ac.in/courses/108/104/108104052/

4) IIT Delhi :

https://nptel.ac.in/courses/108/102/108102047/

5) IIT Bombay:

https://nptel.ac.in/courses/108/101/108101040/

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