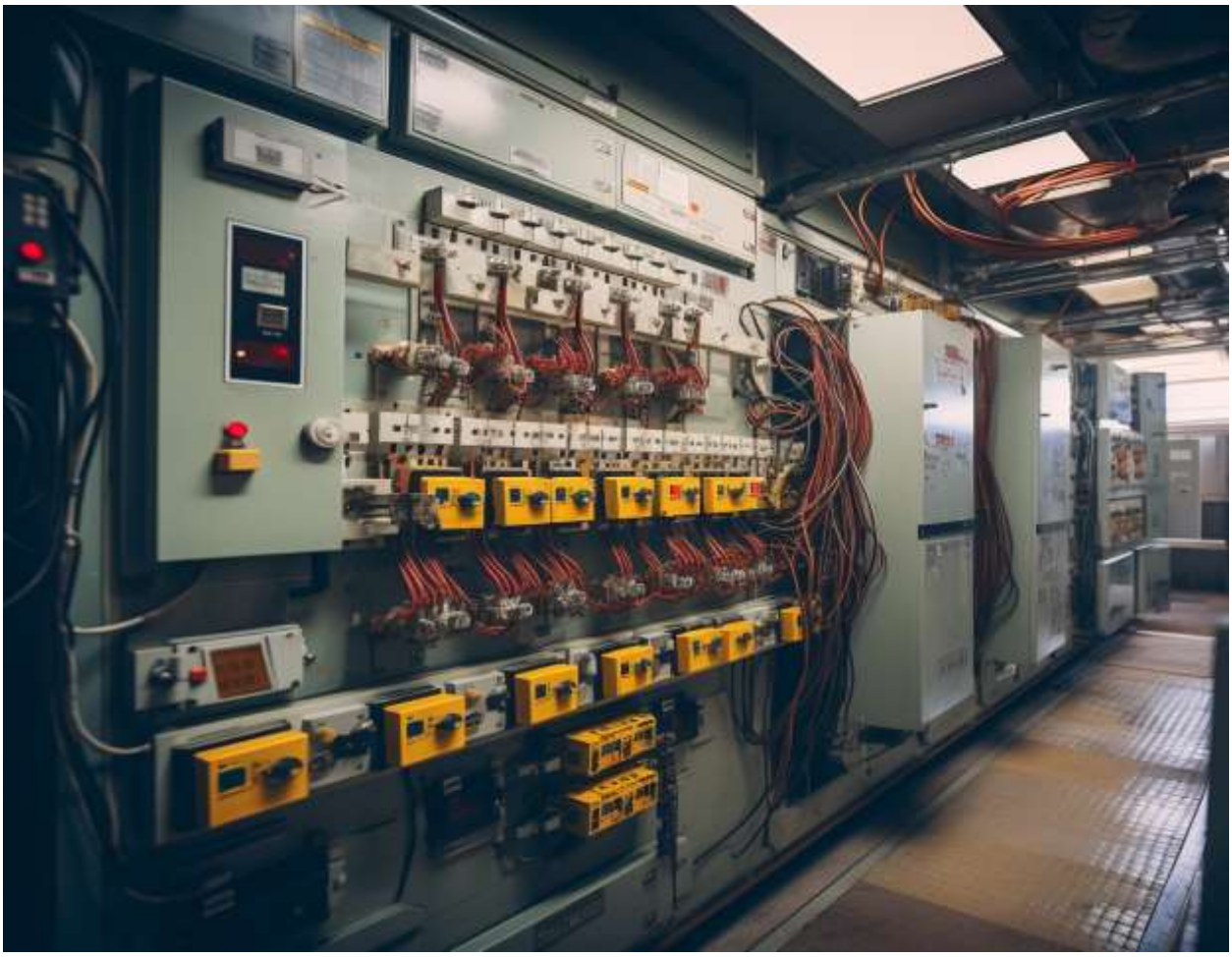
POWER PROJECTS
powering the future



TECHNO COMMERCIAL OFFER – TRAINING ON ETAP

Office of Issue:

Power Projects
#4/499/5 Vinoba Nagar,
Velliyampalayam,
Koduvai – 638660,
Phone: +91 –8220426952 / 7200987393,
GSTIN: 33AMLPN4684L1ZG
Email: ajith@powerprojectsindia.com / bd@powerprojectsindia.com

PP/707522012024/Rev - 0 **22.01.2024**

Dear Sir,

Sub: Techno-commercial offer – Training on ETAP

Thank you very much for your enquiry. We are pleased to submit our Techno-commercial offer for your kind consideration.

We hope our offer is in line with your expectations. Should you need any clarifications or information, please feel free to contact us. In case of any queries, we shall be pleased to address the same.

Thanking You

Yours Truly

For **Power Projects**

Ajithkumar G
Bids & Proposal Manager

REVISION HISTORY

Rev. No	Date	Description	Prepared By	Reviewed By	Approved By	Remarks
0	22.01.2024	Original issue	KI	TS	AK	

TABLE OF CONTENT

1. ABOUT US

POWER PROJECTS, established in the year of 2006. Being Quality organisation that provides quality Electrical and Consultancy services to Power Plant, Process & Manufacturing industries and Commercial Buildings. “We have strong domain knowledge to meet the customer requirements by optimizing the cost without compromising the quality”. Our commitment is to exceed the expectations of our clients by providing innovative solutions, outstanding services and value addition. Our skills include every aspect of engineering, design, detail engineering and we provide continuous technical support. Technical expertise coupled with experience and team work makes POWER PROJECTS an ideal choice for your engineering needs.

2. ASSUMPTIONS & BASIS OF OFFER

We have prepared this offer based on RFQ 21.01.2024.

3. SCOPE, METHODOLOGY & TIME FRAME

3.1. SCOPE

The scope of Training includes the followings,

S. No	Training Modules	Days	Hours/day	Total Hours
1	ETAP	5	6	30

3.1.1.METHODOLOGY

GENERAL

- Number of participants limited to 32

4. EXCLUSION

- Software

5. COMMERCIAL TERMS AND CONDITIONS

S. No	Software	Training Mode	Number of days	Total Price (INR)
1	ETAP	Offline	**5**	**40,000 /- + GST (Forty Thousand + GST)**

5.1. PAYMENT TERM

- 50% Advance along with purchase order and balance 50% upon completion
- Payment shall be within 28 days from date of Invoice

5.2. TAXES AND DUTIES

Price indicated is exclusive of Taxes and duties. Taxes and duties will be applicable as per norms.

5.3. VALIDITY

Our offer is valid for 30 days from the date of offer and is subject to our confirmation thereafter.

5.4. ORDER MODIFICATION

All Changes / Variations occurring in the scope of work during the execution of the project would be raised as a Change Notification (Variation Order) and the same would be billed extra.

5.5. FORCE MAJEURE

Our offer is subject to standard force majeure conditions.

KAMARAJ
COLLEGE OF ENGINEERING & TECHNOLOGY

(An Autonomous Institution - Affiliated to Anna University, Chennai)
S.P.G. Chidambara Nadar - C. Nagammal Campus
S.P.G.C. Nagar, K.Vellakulam - 625 701 (Near VIRUDHUNAGAR)

APPROVAL BOOK

Book No. EEE Date 22-01-2024.

SL.No. 5

Requisition to conduct Value added course (2023-24 - even sem) on ETAP software by Power Projects, chennai. This course will make the students to do consultancy / project work in Industries. (Accommodation and food required for resource person at free of cost).

Details:

Batch strength : 32 (II year)
Duration : 5 days (12-02-2024 to 16-02-2024)
course fee / student : 1250 (Proposal enclosed)
Total amount in Rs. : 1250 X 32 = 40,000
GST (18 %) = 7,200
Total amount in Rs. (inclusive GST) = 47,200

22/01/24
Signature of Staff
[S. JEGAN]

HoD

PRINCIPAL 22/1/24

OFFICE USE

1) Account Head : Value Added Course
2) Budget allotted : Last year Rate Rs. 1,250/-
3) Amount committed / Spent sofar :
4) Balance available :

Administrative Officer

Secretary

POWER PROJECTS

TAX INVOICE

POWER PROJECTS

PROJECTS
5, VELLIYAMPALAYAM
AI
-638660
N: 33AMLPN4684L1ZG
me : Tamil Nadu, Code : 33

College of Engineering and Technology
ndambara Nadar, C Nagammal Campus,
Nagar, K.Vellakulam-625 701,
PO),
dhunagar
N: 33AAATK1431B1ZH
me : Tamil Nadu, Code : 33

(other than consignee)
College of Engineering and Technology
ndambara Nadar, C Nagammal Campus,
Nagar, K.Vellakulam-625 701,
N: 33AAATK1431B1ZH
me : Tamil Nadu, Code : 33

Invoice No. **PP/23-24/314**	Dated **16/02/2024**
Delivery Note	Mode/Terms of Payment
Supplier's Ref.	Other Reference(s) **100**
Buyer's Order No.	Dated 22.01.2024
G.R. No. & Date	Delivery Note Date
Despatched through	Destination

Bank Account Details
AC Name: PowerProjects
AC No: 1056102000002356
Bank: IDBI Bank, Kangeyam
IFSC Code: IBKL0001056
SwIFT CODE: IBKLINBB113

Description of Service	HSN/SAC	Quantity	Rate	per	Disc. %	Amount
s Training	998346	1.00	40000.00			40000.00
TOTAL						40000.00
CGST			*9.00%*			3600.00
SGST			*9.00%*			3600.00
Rounded Off						0.00
Total						**₹ 47,200.00**

E. & O.E

mount Chargeable (in words)
Forty Seven Thousand Two Hundred Only

HSN/SAC	Taxable Value	CGST		SGST		Total Tax Amount
		Rate	Amount	Rate	Amount	
	40000.00	9.00%	3600.00	9.00%	3600.00	
Total	**40000.00**		**3600.00**		**3600.00**	

Tax Amount (in words) :

PAN :
AMLPN4684L

for POWER PROJECTS

Authorised Signatory

Declaration
We declare that this invoice shows the actual price of the goods described and that all particulars are true and correct.

This is a Computer Generated Invoice

KAMARAJ
COLLEGE OF ENGINEERING & TECHNOLOGY
(An Autonomous Institution - AFFILIATED TO ANNA UNIVERSITY, CHENNAI)
S.P.G.Chidambara Nadar - C.Nagammal Campus
S.P.G.C. Nagar, K.Vellakulam – 625 701 (Near VIRUDHUNAGAR).

08-02-2024

CIRCULAR

The Department of Electrical and Electronics Engineering of Kamaraj College of Engineering and Technology organizes 5 days Value added course for II EEE from 12-02-2024 to 16-02-2024. The detail of the course is given below.

Name of Value added course	Conducted by	Venue
ETAP software	Power Projects, Koduvai, Tiruppur	PSS Lab, D Block IV floor

HoD / EEE

Copy to:

1. To be read in II EEE class room
2. Circulated to all the EEE teaching faculty members through their email ID.
3. HoD / EEE
4. File

KAMARAJ
COLLEGE OF ENGINEERING & TECHNOLOGY
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S.P.G.Chidambara Nadar - C.Nagammal Campus
S.P.G.C. Nagar, K.Vellakulam – 625 701 (Near VIRUDHUNAGAR).

Date: 07.02.2024

Department of Electrical and Electronics Engineering

(Accredited by NBA, New Delhi)

Submitted to the Principal through Dean (Academic Courses)

Sub: Requesting permission to nominate the three member committee for **Value added course** – 2022 – 2026 Batch II year UG candidates in 2023 – 2024 EVEN Semester – Reg.

As per the current needs in industry, we need to provide the **Value added course for** 2022 – 2026 Batch II year UG candidates in 2023 – 2024 EVEN Semester. In connection with this clause, three members committee has been constituted to scrutinize the **Value added course** evaluation.

Members List

S. No.	Members	Category
1	Dr. D. Prince Winston, Head & Prof./EEE	Head of the Department
2	Dr.B.Gurukarthik babu, AP / EEE	PG chairperson
3	Mr.R.Ganesan, AP / EEE	UG course coordinator

We hereby request you to provide permission to nominate the above said three members committee to review the **Value added course**.

HoD/EEE **Dean (Academic Courses)** **Principal**

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S.P.G.C. Nagar, K.Vellakulam – 625 701 (Near VIRUDHUNAGAR).

Department of Electrical and Electronics Engineering

(Accredited by NBA, New Delhi)

Submitted to the Principal through Dean (Academic Courses)

Sub: Requisition to recommend "**ETAP software**" for 2022 – 2026 Batch II year UG candidates in 2023 – 2024 EVEN semester.

As per the current needs in industry, we need to provide the **Value added course for** 2022 – 2026 Batch II year UG candidates in 2023 – 2024 EVEN Semester. In connection with this clause, three members committee has been constituted to scrutinize the **Value added course** evaluation, meeting has been convened on 08-02-2024 **(01.30 PM to 02.30 PM)** at PG14, Academic Block – D, EEE Department, Kamaraj College of Engineering and Technology, Virudhunagar.

Members List

S. No.	Members	Category	Signature
1	Dr. D. Prince Winston, Head & Prof./EEE	Head of the Department	
2	Dr.B.Gurukarthik babu, AP / EEE	PG chairperson	
3	Mr.R.Ganesan, AP / EEE	UG course coordinator	

The three member committee has recommended the Value added course **"ETAP software"** (2023 – 2024 EVEN semester) for 2022 – 2026 Batch.

HoD/EEE

Dean (Academic Courses)

Principal

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COLLEGE OF ENGINEERING & TECHNOLOGY

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Department of Electrical and Electronics Engineering

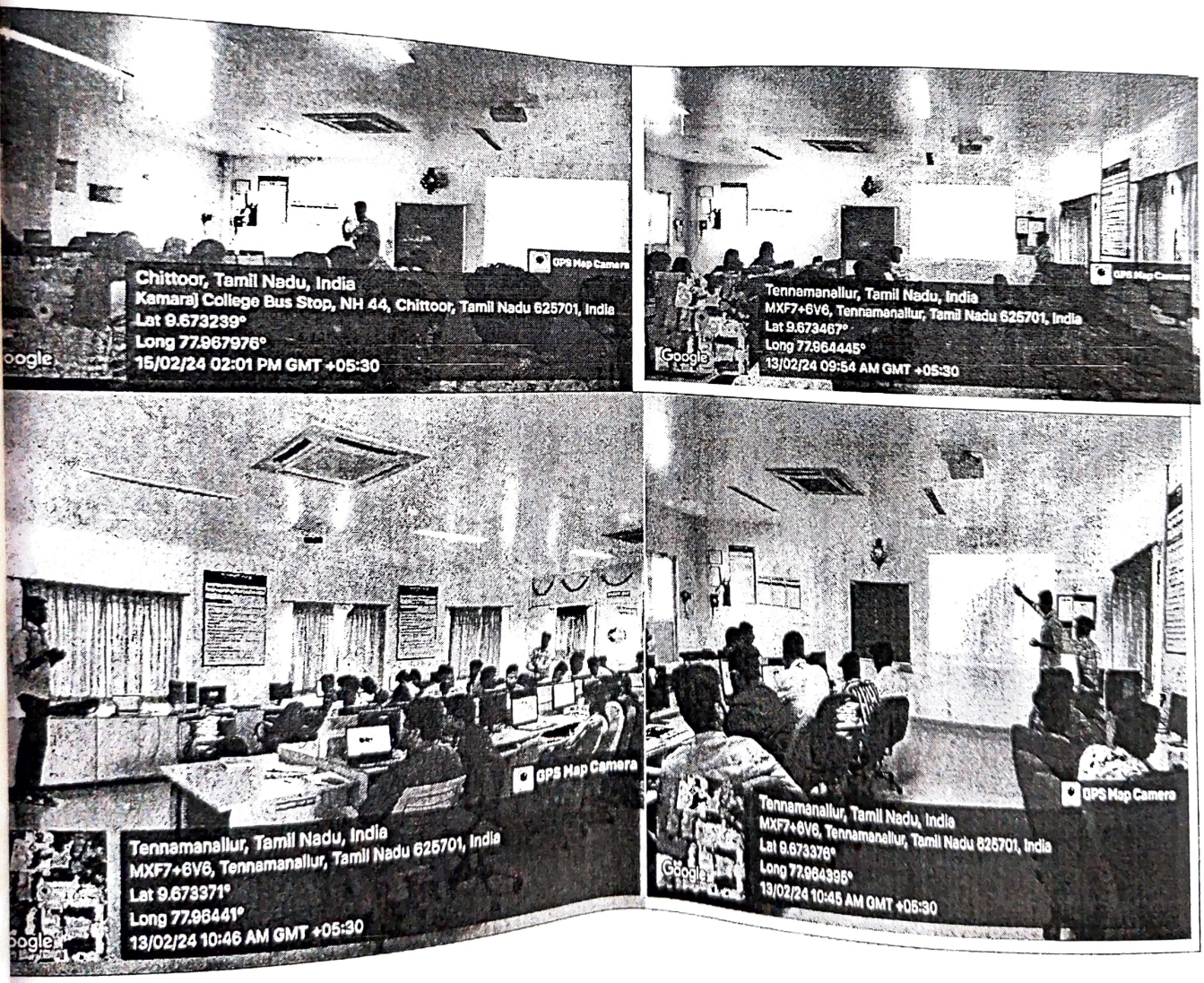
(Accredited by NBA, New Delhi)

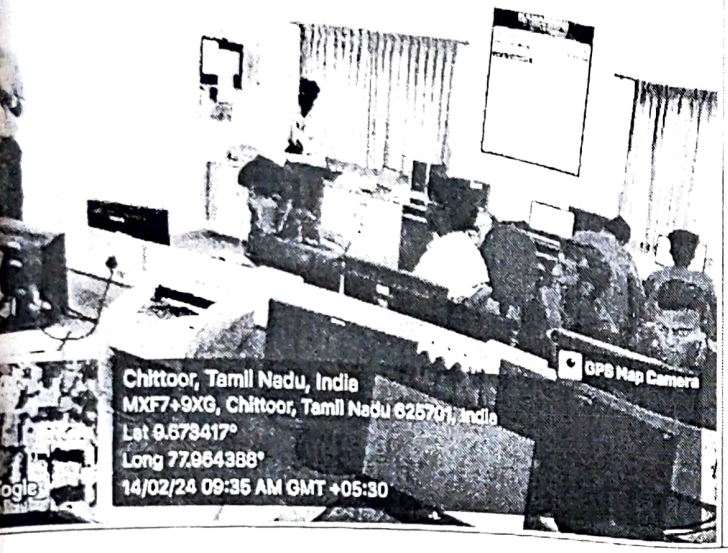
In association with Power Projects, Koduvai, Tiruppur.

Value Added Course on "ETAP software"

2023-24 EVEN Semester (February 2024)

Class: II EEE (2022-2026) Batch





Staff Incharge

S. Jegan

HoD / EEE

Overall feedback Analysis for Value added course on ETAP Software.

ID	Start time	Completion time	Email	Name	About technical presentt	About the lab facility	About the course mater	Effectiveness of the cou	Any other points to improve the conduct of program like Value added Courses in fut
1	2/16/24 16:19:01	2/16/24 16:19:22	22uee001@kamarajeng	HARIKUMARAN.S	Very good	Satisfactory	Very good	Satisfactory	Nothing
2	2/19/24 9:27:42	2/19/24 9:30:32	22uee002@kamarajeng	ABDUL RAHMAN FAISAL.F	Very good	Very good	Very good	Very good	nothing because more value for added in section for me i like these section thank you
3	2/26/24 13:36:35	2/26/24 13:40:20	22uee003@kamarajeng	VISHAAL.S	Very good	Very good	Very good	Very good	We need advance courses
4	2/26/24 13:35:49	2/26/24 13:37:03	[illegible]	MANJULADEVI.P	Very good	Good	Good	Very good	Nothing
5	2/26/24 13:35:39	2/26/24 13:36:43	22uee005@kamarajeng	KANKESHRAJ.A	Very good	Very good	Very good	Very good	Want the advance version of it
6	2/19/24 9:25:49	2/19/24 9:26:42	22uee007@kamarajeng	MUKILAN.M	Satisfactory	Satisfactory	Very good	Very good	still more effective seriousness has to be taken and more value added course has to be conducted in the department
7	2/26/24 13:35:49	2/26/24 13:37:03	22uee008@kamarajeng	DEEPA VISHALI	Very good	Good	Good	Very good	Nothing
8	2/17/24 11:31:52	2/17/24 11:32:05	22uee009@kamarajeng	MADHUMITH.M	Good	Very good	Very good	Very good	Excellent
9	2/18/24 9:22:25	2/18/24 9:23:10	22uee010@kamarajeng	LAVANYA.M	Satisfactory	Very good	Very good	Very good	Installation of software in college computer systems
10	2/19/24 9:29:31	2/19/24 9:29:47	22uee011@kamarajeng	PAUL EBINESH.G	Good	Good	Good	Good	super
11	2/26/24 13:38:17	2/26/24 13:38:40	22uee012@kamarajeng	SUDHARSAN.V.K	Satisfactory	Satisfactory	Satisfactory	Satisfactory	No queries
12	2/17/24 11:31:35	2/17/24 11:32:52	22uee013@kamarajeng	KESAVAN.M	Very good	Very good	Very good	Very good	-
13	2/26/24 13:37:17	2/26/24 13:40:35	[illegible]	PARTHA SARATHY.S	Very good	Very good	Very good	Very good	We need advance course
14	2/16/24 19:08:21	2/16/24 19:10:53	22uee015@kamarajeng	RAM.V	Very good	Very good	Very good	Very good	I need advanced value added courses
15	2/26/24 13:37:17	2/26/24 13:40:35	22uee016@kamarajeng	VIGNESH.S	Very good	Very good	Very good	Very good	We need advance course
16	2/16/24 18:57:50	2/16/24 18:58:47	22uee017@kamarajeng	SANTHIYA.J	Very good	Good	Good	Very good	Need more concentration on Lab facility
17	2/16/24 19:06:23	2/16/24 19:07:10	22uee018@kamarajeng	KARUPPASAMY.S	Very good	Very good	Very good	Very good	Better future this course for me
18	2/19/24 9:28:56	2/19/24 9:30:41	22uee019@kamarajeng	HARIBASKARAN.A	Very good	Very good	Very good	Very good	Good friendly and, good teaching
19	2/17/24 11:32:27	2/17/24 11:32:42	22uee020@kamarajeng	AMUTHAN.N	Very good	Very good	Very good	Very good	Nice
20	2/26/24 13:36:07	2/26/24 13:36:54	[illegible]	CHARUPRIYA.G	Very good	Very good	Very good	Very good	Helpfull
21	2/26/24 13:40:30	2/26/24 13:40:55	22uee022@kamarajeng	THAMEESH AHAMED.M	Good	Good	Good	Good	No onw
22	2/26/24 13:36:41	2/26/24 13:38:01	22uee023@kamarajeng	SETHUPATTI.M	Good	Good	Good	Good	Incorporate more interactive elements such as case studies, group discussions, hands-on exercises, and simulations to engage participants actively and facilitate better learning outcomes.
23	2/26/24 13:36:07	2/26/24 13:36:54	22uee024@kamarajeng	HARISHKUMAR.K	Very good	Very good	Very good	Very good	Helpfull
24	2/16/24 18:57:50	2/16/24 18:58:47	[illegible]	POOJA K	Very good	Good	Good	Very good	Need more concentration on Lab facility
25	2/16/24 19:15:16	2/16/24 19:40:17	22uee026@kamarajeng	PREM.G	Good	Satisfactory	Very good	Very good	Nothing
26	2/26/24 13:37:13	2/26/24 13:37:49	22uee027@kamarajeng	YOGAN DHANUSH.M	Very good	Good	Very good	Very good	Useful to learn etap softtware
27	2/26/24 13:36:28	2/26/24 13:37:39	22uee028@kamarajeng	JOHN RAJ.S	Very good	Very good	Very good	Very good	Value added course is very useful for us and I learned etap software tools
28	2/16/24 17:44:15	2/16/24 17:44:56	22uee029@kamarajeng	MANI KANDAN.K	Very good	Very good	Very good	Very good	Very good
29	2/26/24 13:36:42	2/26/24 13:37:06	22uee030@kamarajeng	JIM ALLEN.D.J	Satisfactory	Satisfactory	Satisfactory	Satisfactory	What like this program more
30	2/26/24 13:41:49	2/26/24 13:42:15	22uee031@kamarajeng	JOSHUA RAJ.R	Good	Good	Good	Good	No
31	2/26/24 13:36:25	2/26/24 13:37:10	22uee032@kamarajeng	HARIKUMARAN.M	Very good	Good	Very good	Very good	Good teaching
32	2/16/24 16:22:07	2/16/24 16:23:20	22uee033@kamarajeng	HARISH KUMAR.V	Good	Good	Good	Very good	Project engineering

Staff Incharge

HoD/EEE

Department of Electrical and Electronics Engineering

(Accredited by NBA, New Delhi)

In association with Power Projects, Koduvai, Tiruppur.

Value Added Course on "ETAP software"

2023-24 EVEN Semester (February 2024) Class: II EEE (2022-2026) Batch

Each question carries TWO marks ***TOTAL: 50 marks***

1. What standard & frequency is used in ETAP?

2. What method is used as default for performing load flow in ETAP?

3. What are the different types of power system studies will come under steady state analysis?

4. What are the standards considered for load flow analysis?

5. Mention the different types of buses in power system?

6. How to copy and paste elements in ETAP workspace?

7. What is system dumpster used for?

8. What are the different classifications of transmission lines?

9. Define: Ferranti effect

10. What device is used for Ferranti effect mitigation?

11. What is transformer?

12. What are the parameters to be given in transformer when modelled in ETAP?

13. Define: Deration of transformer. What are the types of deration?

14. Define: Altitude deration with formula

15. Define: Temperature deration with formula

16. How to delete unnecessary elements in ETAP?

17. Write Actual MVA formula.

18. What are the different conditions for paralleling transformer?

19. What are the different types of load available in ETAP?

20. What are the k values for ZIP loads?

21. What are the four operating modes in Generator?

22. What is Short circuit?

23. What are the different types of faults?

24. What are the standards for Short circuit studies?

25. What are the limitations of IEC 60909?

1] Consider a grid connected two bus system [no load] with sending end voltage of 132 kV, 450 km long transmission line. In transmission line: Parameter tab, Select SULPHUR as phase conductor & select 37 No.7 as Ground wire. In Configuration tab, give height as 20 m. Spacing is AB = BC = 5m & CA = 10m. The number of ground wires is 1, CG length is 5m. Now perform load flow analysis and observe the effect in transmission line.

2] Consider a grid connected two bus system [no load] with sending end voltage of 400 kV, 380 km long transmission line. In transmission line: Parameter tab, Select XENON as phase conductor & select 37 No.5 as Ground wire. In Configuration tab, give height as 20 m. Spacing is AB = BC = 5m & CA = 10m. The number of ground wires is 1, CG length is 5m. Now perform load flow analysis and observe the effect in transmission line.

3] Consider a grid connected two bus system [no load] connected by transformer: 110/33 kV, 300 MVA, set impedance and X/R as typical data with Dyn1 vector group. Assume that the transformer is placed in 1500 m altitude from mean sea level and the transformer is derated. Find the derated MVA by manual calculation and verify the same using simulation.

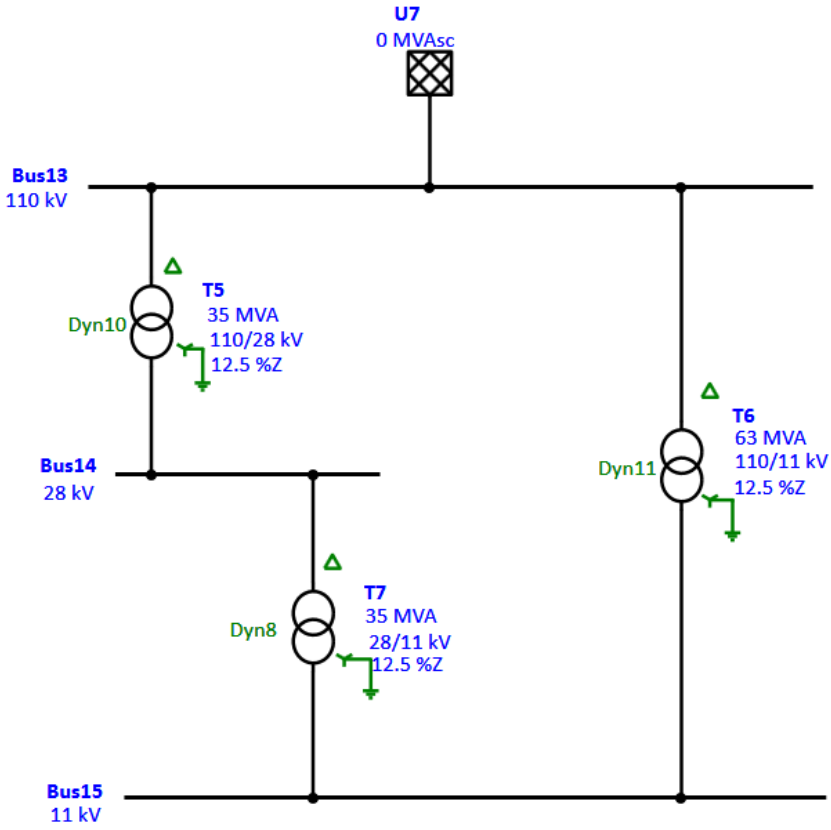
4] Consider a grid connected two bus system [no load] connected by transformer: 110/11 kV, 400 MVA, set impedance and X/R as typical data with Dyn0 vector group. Assume that the transformer is placed in 1800 m altitude from mean sea level and the transformer is derated. Find the derated MVA by manual calculation and verify the same using simulation.

5] Consider a grid connected two bus system [no load] connected by transformer: 110/11 kV, 500 MVA, set impedance and X/R as typical data with Dyn11 vector group. Assume that the transformer is operating in 35 deg from the normal ambient temperature and the transformer is derated. Find the derated MVA by manual calculation and verify the same using simulation.

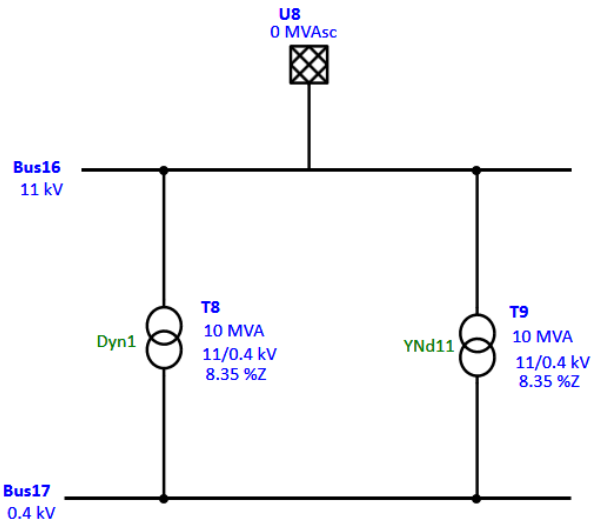
6] Consider a grid connected two bus system [no load] connected by transformer: 110/22 kV, 600 MVA, set impedance and X/R as typical data with Dyn1 vector group. Assume that the transformer is operating in 38 deg from the normal ambient temperature and the transformer is derated. Find the derated MVA by manual calculation and verify the same using simulation.

7] Model the system given below. Check for transformer paralleling condition. If this system is not properly paralleled then do the changes for transformer paralleling.

Note:: do not alter the T6 parameters.



8] Model the system given below. Check for transformer paralleling condition. If this system is not properly paralleled then do the changes for transformer paralleling. After simulating LF without load, connect a lumped load in BUS 17 with parameters of lumped load:
15 MVA, constant power load, 85% power factor. Observe the load sharing.



COLLEGE OF ENGINEERING & TECHNOLOGY

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Department of Electrical and Electronics Engineering

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In association with Power Projects, Koduvai, Tiruppur.

Value Added Course on "ETAP software"

2023-24 EVEN Semester (February 2024)

Class: II EEE (2022-2026) Batch

S.No.	Roll No.	Name	12-02-2024		13-02-2024		14-02-2024		15-02-2024		16-02-2024	
			FN	AN	FN	AN	FN	AN	FN	AN	FN	AN
1	22UEE001	HARI KUMARAN S										
2	22UEE002	ABDUL RAHMAN FAISAL F										
3	22UEE003	VISHAAL S										
4	22UEE004	MANJULADEVI P										
5	22UEE005	KANKESHRAJ A										
6	22UEE007	MUKILAN M			OD	OD						
7	22UEE008	DEEPAVISHALI S										
8	22UEE009	MADHUMITHA M										
9	22UEE010	M LAVANYA										
10	22UEE011	PAUL EBINESH G										
11	22UEE012	V K SUDHARSAN										
12	22UEE013	KESAVAN M										
13	22UEE014	S PARTHA SARATHY			OD	OD						
14	22UEE015	RAM V										
15	22UEE016	VIGNESH S										

S.No.	Roll No.	Name	12-02-2024 FN	AN	FN	AN	FN	AN	FN	AN	FN	AN
16	22UEE017	SANTHIYA J										
17	22UEE018	KARUPPASAMY S										
18	22UEE019	HARIBASKARAN A										
19	22UEE020	AMUTHAN N										
20	22UEE021	CHARUPRIYA G										
21	22UEE022	THAMEESH AHAMED M										
22	22UEE023	SETHU PATHI M										
23	22UEE024	HARISH KUMAR K										
24	22UEE025	POOJA K										
25	22UEE026	PREM G										
26	22UEE027	YOGAN DHANUSH M										
27	22UEE028	JOHN RAJ S										
28	22UEE029	MANI KANDAN K										
29	22UEE030	JIM ALLEN D J										
30	22UEE031	JOSHUA RAJ R										
31	22UEE032	HARIKUMARAN M										
32	22UEE033	HARISH KUMAR V										

16/02

STAFF INCHARGE

S. Jegan

HoD / EEE

S. Harikumaran
22UEE001

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powering the future

KAMARAJ COLLEGE OF ENGINEERING & TECHNOLOGY
An Autonomous Institution
S.P.G. Chidambara Nadar - G. Nagammal Campus
S.P.G.C. Nagar, K. Vellakulam - 625 701 (Near VIRUDHUNAGAR)

40/60

18+22/50

Department of Electrical and Electronics Engineering

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In association with Power Projects, Koduvai, Tiruppur.

Value Added Course on "ETAP software"

2023-24 EVEN Semester (February 2024) Class: II EEE (2022-2026) Batch

Each question carries TWO marks ***TOTAL: 50 marks*** +V-10m

1. What standard & frequency is used in ETAP?

Ans The ETAP software are been used for the various standard like (IEE, ICE) and the frequency of ETAP has obtain to the 50 Hz to 60 Hz ✓

2. What method is used as default for performing load flow in ETAP?

Ans The Newton ~~Dest~~ - Raphon is used as default for the programming for the load flow in ETAP. ✓

3. What are the different types of power system studies will come under steady state analysis?

Ans The different types of power system studies which come under the steady state analysis are ~~Three~~ Bus types which are been known to be (PQ Bus, load Bus, PV Bus)

4. What are the standards considered for load flow analysis?

The standards are IEEE Std 15-2023, IEC 60371-2020, and IEEE 604, ICE 60909 where are the standards are consider for load flow analysis. ✓

5. Mention the different types of buses in power system?

Ans There are three types of Buses in power system that are PQ Buses, load Buses, and also the PV Buses ✓

6. How to copy and paste elements in ETAP workspace?

Ans First we want to select the Element and use the Ctr - C to Copy the Element and then use the Shift + Ctr + V to past the Element from not store in the Room

7. What is system dumpster used for?

It is used for the store the Comã Element and used to the Reuse the Stord Element ✓

8. What are the different classifications of transmission lines?

Ans The classification of the transmission line also ~~High~~ low Voltage line Middle Voltage Line and the High Voltage line ✓

9. Define: Ferranti effect

Ans It occurs when there AC source of the starting point has the High Voltage at the same time the the End point has the same High Voltage ✓

10. What device is used for Ferranti effect mitigation?

Ans The Bus device are been used for the Ferranti effect ~~mitig~~ Mitigation in the ETAP ✓

11. What is transformer?

Ans It is a device used to Convert the High Voltage into low Voltage and also also to Convert the low Voltage into High Voltage ✓

12. What are the parameters to be given in transformer when modelled in ETAP?

Ans The parameter to be given as the Value of MVA Voltage and low End of the Voltage and also the Impedance Value

13. Define: Deration of transformer. What are the types of deration?

The types of the Doration are the Percentage Value and other Power factor Value will be known as

14. Define: Altitude deration with formula

1 The 0.98 a Relation $a = \text{Relation}_{MVA}\left(\frac{\text{Voltage} \times \text{Doration \%}}{1000}\right)$ 2

15. Define: Temperature deration with formula

1 The 0.99 b Temperature deration 2

16. How to delete unnecessary elements in ETAP?

2 By using the Shift + Delete option to delete the

17. Write Actual MVA formula.

2 Actual MVA = Rated MVA $\left(\frac{\text{Rated MVA} \times \text{Doration \%}}{1000}\right)$

18. What are the different conditions for paralleling transformer?

Where can the Flowrate Value of the at the Exposes of Rated value are Been use 2

19. What are the different types of load available in ETAP?

Constant PQ, Z and the Motor loads, the Lightening load there are the different stages of load 2

20. What are the k values for ZIP loads?

The K Value P in Constant is 0 the K value when VI is Constant is 1 and the K is 2 at PVI/2 is Constant

21. What are the four operating modes in Generator?

Short, Middle, Middel Large, And Large are here 1

22. What is Short circuit?

It is an Electrical circuit when Unintentupath has been Creat When the High flow 2

23. What are the different types of faults?

2 Series fault
Shunt fault ✓

24. What are the standards for Short circuit studies?

2 IEC 60909 - 206
IEE 300.2 - 2015 ✓

25. What are the limitations of IEC 60909?

F. Abdul Rahman Faisal 22UEE002

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Value Added Course on "ETAP software"

2023-24 EVEN Semester (February 2024) Class: II EEE (2022-2026) Batch

36 + 10
46/60

Each question carries TWO marks ***TOTAL: 50 marks*** +V-10m

1. What standard & frequency is used in ETAP?
Calculates and Plots the magnitudes & phase angles of the driving point Impedance over a frequency range specified by the user

2. What method is used as default for performing load flow in ETAP?
An method is used as default for performing load flow in Etap is bus voltage, branch power factory, system Losses &

3. What are the different types of power system studies will come under steady state analysis? Short circuit study, Harmonic analysis, Arc flash analysis Coordination study

4. What are the standards considered for load flow analysis?
Newton raphson method is widly used method for Load flow analysis because of its good convergence. Compares to other method

5. Mention the different types of buses in power system?
Based on there variables : Slack, generation, load buses

6. How to copy and paste elements in ETAP workspace?
Ctrl + Shift + V

7. What is system dumpster used for?
The main purpose of dumpster is to store garbage until it is emptied by a garbage truck for disposal

8. What are the different classifications of transmission lines?
Overhead transmission lines Substransmission lines. underground Transmission line

9. Define: Ferranti effect
Voltage increase in the receiving end of an electrical transmission line when it is operated in a no-Load or low-Load condition

10. What device is used for Ferranti effect mitigation?
Thyristor Controlled Reactor (TCR) & fixed Inductor to reduce the ferranti effect

11. What is transformer?
A device that transfers electric energy from one alternating current circuit to one or more other circuits, either increasing or reducing the voltage

12. What are the parameters to be given in transformer when modelled in ETAP?

Value of the primary KV, Secondary KV, Primary winding rating in KVA or MVA, and the max transformer rating

13. Define: Deration of transformer. What are the types of deration?

(IEEE C57.110) provides types are : Power transformer, Pulse transformer, IF transformer, RF transformer

14. Define: Altitude deration with formula

Altitude deration $= 0.98^a$

a : (actual altitude - nominal altitude) / 100

15. Define: Temperature deration with formula

Temperature deration $= 0.99^b$

b : (actual T - ambient)

16. How to delete unnecessary elements in ETAP?

Shift + delete

17. Write Actual MVA formula.

MVA = V - A

18. What are the different conditions for paralleling transformer?

% Impedance should be same, Ratios of (X/R) should be same

19. What are the different types of load available in ETAP?

~~Induction motor~~, Lumped Load, Static Load,

20. What are the k values for ZIP loads?

Constant Impedance, constant-current & constant power load

21. What are the four operating modes in Generator?

Stand-alone, island & parallel with the utility

22. What is Short circuit?

Occurs when the current finds a way to bypass appliance on a path has little or no resistance

23. What are the different types of faults?

normal, reverse, Strike-Slip & Oblique

24. What are the standards for Short circuit studies?

an analysis of an electrical system that determines the magnitude of the currents that flow during an electrical fault

25. What are the limitations of IEC 60909?

The max Instantaneous Value of the Short-circuit current

ETAP

Consider a grid Connected two bus System (no load) With Sending end Voltage of 400kV. 380 km long Transmission line : Parameters tab, Select XENON as Phase Conductor & Select 37 No: 5 as Ground wire in Configuration Tab. given Height as 20 m Spacing is AB = BC = 5m & CA = 10 M. the number of ground wires is 1. CG length is 5m Now perform load flow Analysis & observe the effect in Transmission line.

Ferranti Effect :

Ferranti effect is a phenomenon that describes the increase in voltage that happens at the receiving end of a long transmission line compared with the voltage

Equipments :

power grid
Bus
Transmission line

To reduce :

It can be reduced by placing shunt reactor at the receiving end of line

Causes :

Transmission line Capacitance
Load at the receiving end
Supply frequency

Rating :

Real power : 0.746 MW

Reactive power : -202.7 Mvar

Advantages

Power factor improvement, voltage Regulation

Disadvantages

Over voltage
Efficiency

JoB Opportunity

- Electrical Design Engineer
- Power System Engineer
- ETAP Trainer

Packages
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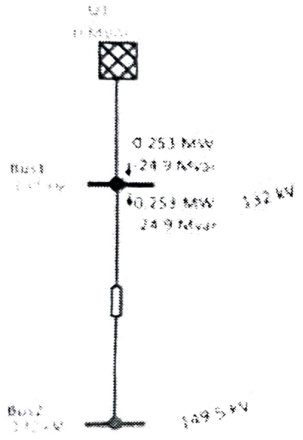
etap Software

Ferranti effect :

Problem Identification :

Consider a grid connected two bus system [no load] with sending end voltage of 132 k
150 km long transmission line. In transmission line : Parameters tab, select SULPHUR as pha
conductor & Select 37 No. 7 as ground wire. In Configuration tab, given heights as 20m.
spacing is AB = BC = 6m & CA = 10m. The number of ground wires is 1, CG length is 5m. Now perform
load flow analysis and observe the effect in transmission line.

One-Line Diagram - OLV1 (Load Flow Analysis)



Features of ETAP

- Load flow Analysis
- Harmonic Analysis
- Motor Acceleration Studies
- voltage Stability Analysis
- Switching Transient
- Graphical user Interface (GUI)
- Reporting and Documentation
- Short circuit Analysis

Job OPPORTUNITIES

- Power System Engineer
- Consulting Engineer
- Renewable Energy Analyst
- Electrical Design Engineer
- Transmission and distribution Engineer
- Research And Development

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ABB

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Program summary

Day 1

ETAP- Electrical Transient and Analysis Program

It is the most comprehensive analysis platform for the design, simulation, operation, and automation of generation, distribution, and industrial power systems.It is developed under an established quality assurance program and is used worldwide as a high impact software.

Power System Analysis:

- Steady State Analysis
- Transient State Analysis

Steady State Analysis:

1. LFA(Load Flow Analysis)
2. SCA(Short Circuit Analysis)
3. MA(Motor Acceleration)
4. RC(Relay Coordination/Protection Coordination)
5. TA(Transient Analysis)
6. HA(Harmonic Analysis)
7. AF(Arc Flash)

Equipment of sub-station are wave trap, lightning arrestor, CVT, CT&PT, Circuit breaker, transformer.

Classification of transmission line

1. Based on distance:
    - Short transmission line
    - Medium transmission line
    - Long transmission line
2. Based on voltage:

- Extra super voltage cables (Beyond 132 kV)
- Extra high-tension (E.H.T.) cables (From 33 kV to 66 kV)
- Super-tension (S.T.) cables (From 22 kV to 33 kV)
- High-tension (H.T.) cables (From 1kV to 11kV)
- Low-tension (L.T.) cables (Up to 1kV)

Some examples of the uses of load flow studies are to determine the following:

- Component or circuit loadings
- Steady-state bus voltages
- Reactive power flows
- Transformer tap settings
- System losses
- Generator exciter/regulator voltage set points
- Performance under emergency conditions

The bus data describes each bus and the load and shunts connected to that bus. The data includes the following:

- Bus number
- Bus name
- Bus type
- Load
- Shunt
- Per unit voltage and angle
- Bus base kV

Day 2

Ferranti Effect:

The effect in which the voltage at the receiving end of the transmission line is more than the sending voltage is known as the Ferranti effect. Such type of effect mainly occurs because of light load or open circuit at the receiving end.

In ETAP we use a static load and change the values of MVA,Mvar from loading bar to overcome Ferranti effect,

Standards for Load Flow Analysis:

1.IEEE 399-1997 – IEEE Recommended Practice for Industrial and Commercial Power Systems Analysis

2.IEEE 3002.2-2018 – IEEE Recommended Practice for Conducting Load-Flow Studies and Analysis of Industrial and Commercial Power Systems

Transformer:

It is an electrostatic and constant power device that transfer electrical energy from one circuit to another circuit with constant frequency it works on principle of Faraday's law of electromagnetic induction and mutual induction. Additional data is required for transformers. This can either be entered as part of the branch data or as a separate data category depending on the particular load flow program being used.

This additional data usually includes the following:

- Tap setting in per unit
- Tap angle in degrees
- Maximum tap position
- Minimum tap position
- Scheduled voltage range with tap step size or a fixed scheduled voltage using a continuous tap approximation

Generator data:

Generator data is entered for each generator in the system including the system swing generator. The data defines the generator power output and how voltage is controlled by the generator. The data items normally entered are as follows:

- Real power output in MW
- Maximum reactive power output in Mvar (i.e., machine maximum reactive limit)
- Minimum reactive power output in Mvar (i.e., machine minimum reactive limit)
- Scheduled voltage in per unit
- Generator in-service/out-of-service code

STANDARDS :

- IEC 60076-16:2018(E), IEC/IEEE International Standard - Power transformers - Part 16: Transformers for wind turbine applications
- IEC 60076-57-1202:2016(E), IEC/IEEE International Standard - Power transformers - Part 57-1202: Liquid immersed phase-shifting transformers
- IEC 60076-57-129:2017(E), IEC/IEEE International Standard - Power transformers--Part 57-129: Transformers for HVDC applications

Derating Factor:

The equipment is rated for some specific due to environment condition the rated value will decrease or degraded to the value less than the rated value.

Uprating Factor:

The equipment is rated for some specific for environmental conditions the rated value uprated to the value higher than the rated value.

Actual MVA = Rated MVA-(Rated MVA*Derated%)/100

Day 3

Lumped load: It has both the parameter of static and rotating load.

Static Load: It is a non rotating load.

Transformer Paralleling: It refers to the connection of multiple Transformer in a parallel configuration to supply a common load this type of correction is used when the load demand exceeds the capacity of a single transformer.

Need For Paralleling Transformer:

When a transformer is designed to supply few loads after few years if the new load exceeds the Transformer rating than parallel of transformer is done to meet the new load.

Condition for Paralleling Transformer are:

- Vector Group Analysis
- Transformer Impedance Analysis
- Voltage Rating
- Tap Ratio
- X/R Ratio
- MVA Rating

$$(S/Si) = (V/Vi)^k$$

Where,

S- Power at voltage V

Si- Initial power at voltage Vi

k= 0 for constant power load

k= 1 for constant current load

k= 2 for constant impedance load

Real Power:

$$P = Pi[C(V/Vi)^2+B(V/Vi)+A]$$

Reactive Power:

$$Q = Qi[F(V/Vi)^2+E(V/Vi)+D]$$

Day 4

What is short circuit?

Accidental or intentional conductive path between two or more conductive parts forcing the electric potential difference between these conducting parts to be equal or close to zero.

Why short circuit?

- It is not a commercial viable to construct a power system which is 100% free from faults.
- Short circuit occur even in a well design power system cause large decaying transient current generally much above load current result electro dynamic and thermal stress.

What are the causes of faults:

- Overhead Lines
  - Ageing
  - Over loading
  - Poor maintenance
  - Bird sitting on live conductor
  - Tree branches falls on live conductor
  - Fire and lighting surge
- Rotating Machines
  - Over speed
  - Moisture
  - Bearing Failure
  - Deterioration of insulation
- Transformers
    - Moisture
    - Deterioration of insulation
    - Lightning surges
    - Switching surges
    - Ageing

Day 5

2. IEEE 3002.2-2018 – IEEE Recommended Practice for Conducting Load-Flow Studies and Analysis of Industrial and Commercial Power Systems
3. IEC 60076-16:2018(E), IEC/IEEE International Standard - Power transformers - Part 16: Transformers for wind turbine applications
4. IEC 60076-57-1202:2016(E), IEC/IEEE International Standard - Power transformers - Part 57-1202: Liquid immersed phase-shifting transformers
5. IEC 60076-57-129:2017(E), IEC/IEEE International Standard - Power transformers--Part 57-129: Transformers for HVDC applications

Limitation of IEEE 60909:

- Not applicable for short circuit testing starters (deliberately created short circuits).
- Not applicable for ships and aero plane.
- Applicable up to 550 KV.
- Applicable for 50 Hz or 60 hertz system.
- Applicable for low voltage and high voltage 3 phase AC system.

Staff In-charge

HoD / EEE

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Regulation: R2021

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1	920422105005	22UEE001	HARI KUMARAN S	40
2	920422105001	22UEE002	ABDUL RAHMAN FAISAL F	46
3	920422105025	22UEE003	VISHAAL S	41
4	920422105013	22UEE004	MANJULADEVI P	45
5	920422105008	22UEE005	KANKESHRAJ A	55
6	920422105014	22UEE007	MUKILAN M	55
7	920422105004	22UEE008	DEEPAVISHALI S	47
8	920422105012	22UEE009	MADHUMITHA M	52
9	920422105011	22UEE010	M LAVANYA	47
10	920422105016	22UEE011	PAUL EBINESH G	47
11	920422105022	22UEE012	V K SUDHARSAN	54
12	920422105010	22UEE013	KESAVAN M	49
13	920422105015	22UEE014	S PARTHA SARATHY	53
14	920422105019	22UEE015	RAM V	41
15	920422105024	22UEE016	VIGNESH S	48
16	920422105020	22UEE017	SANTHIYA J	50

16/2/2024

Mr. R. Pradeep

Power Systems Engineer

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S.No.	Register Number	Roll Number	Name of the student	Assessment (60)
17	920422105009	22UEE018	KARUPPASAMY S	44
18	920422105006	22UEE019	HARIBASKARAN A	49
19	920422105002	22UEE020	AMUTHAN N	54
20	920422105003	22UEE021	CHARUPRIYA G	51
21	920422105023	22UEE022	THAMEESH AHAMED M	40
22	920422105021	22UEE023	SETHU PATHI M	43
23	920422105007	22UEE024	HARISH KUMAR K	41
24	920422105017	22UEE025	POOJA K	50
25	920422105018	22UEE026	PREM G	56
26	920422105307	22UEE027	YOGAN DHANUSH M	48
27	920422105304	22UEE028	JOHN RAJ S	43
28	920422105306	22UEE029	MANI KANDAN K	51
29	920422105303	22UEE030	JIM ALLEN D J	42
30	920422105305	22UEE031	JOSHUA RAJ R	49
31	920422105301	22UEE032	HARIKUMARAN M	42
32	920422105302	22UEE033	HARISH KUMAR V	48

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16/2/2024

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1	920422105005	22UEE001	HARI KUMARAN S	10	10	10	10	40
2	920422105001	22UEE002	ABDUL RAHMAN FAISAL F	10	10	10	10	40
3	920422105025	22UEE003	VISHAAL S	10	10	10	10	40
4	920422105013	22UEE004	MANJULADEVI P	10	10	10	10	40
5	920422105008	22UEE005	KANKESHRAJ A	10	10	10	10	40
6	920422105014	22UEE007	MUKILAN M	10	10	10	10	40
7	920422105004	22UEE008	DEEPAVISHALI S	10	10	10	10	40
8	920422105012	22UEE009	MADHUMITHA M	10	10	10	10	40
9	920422105011	22UEE010	M LAVANYA	10	10	10	10	40
10	920422105016	22UEE011	PAUL EBINESH G	10	10	10	10	40
11	920422105022	22UEE012	V K SUDHARSAN	10	10	10	10	40
12	920422105010	22UEE013	KESAVAN M	10	10	10	10	40
13	920422105015	22UEE014	S PARTHA SARATHY	10	10	10	10	40

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22	920422105021	22UEE023	SETHU PATHI M	10	10	10	10	40
23	920422105007	22UEE024	HARISH KUMAR K	10	10	10	10	40
24	920422105017	22UEE025	POOJA K	10	10	10	10	40
25	920422105018	22UEE026	PREM G	10	10	10	10	40
26	920422105307	22UEE027	YOGAN DHANUSH M	10	10	10	10	40
27	920422105304	22UEE028	JOHN RAJ S	10	10	10	10	40
28	920422105306	22UEE029	MANI KANDAN K	10	10	10	10	40
29	920422105303	22UEE030	JIM ALLEN D J	10	10	10	10	40
30	920422105305	22UEE031	JOSHUA RAJ R	10	10	10	10	40
31	920422105301	22UEE032	HARIKUMARAN M	10	10	10	10	40
32	920422105302	22UEE033	HARISH KUMAR V	10	10	10	10	40

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1	920422105005	22UEE001	HARI KUMARAN S	40	40	80
2	920422105001	22UEE002	ABDUL RAHMAN FAISAL F	46	40	86
3	920422105025	22UEE003	VISHAAL S	41	40	81
4	920422105013	22UEE004	MANJULADEVI P	45	40	85
5	920422105008	22UEE005	KANKESHRAJ A	55	40	95
6	920422105014	22UEE007	MUKILAN M	55	40	95
7	920422105004	22UEE008	DEEPAVISHALI S	47	40	87
8	920422105012	22UEE009	MADHUMITHA M	52	40	92
9	920422105011	22UEE010	M LAVANYA	47	40	87
10	920422105016	22UEE011	PAUL EBINESH G	47	40	87
11	920422105022	22UEE012	V K SUDHARSAN	54	40	94

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12	920422105010	22UEE013	KESAVAN M	49	40	89
13	920422105015	22UEE014	S PARTHA SARATHY	53	40	93
14	920422105019	22UEE015	RAM V	41	40	81
15	920422105024	22UEE016	VIGNESH S	48	40	88
16	920422105020	22UEE017	SANTHIYA J	50	40	90
17	920422105009	22UEE018	KARUPPASAMY S	44	40	84
18	920422105006	22UEE019	HARIBASKARAN A	49	40	89
19	920422105002	22UEE020	AMUTHAN N	54	40	94
20	920422105003	22UEE021	CHARUPRIYA G	51	40	91
21	920422105023	22UEE022	THAMEESH AHAMED M	40	40	80
22	920422105021	22UEE023	SETHU PATHI M	43	40	83
23	920422105007	22UEE024	HARISH KUMAR K	41	40	81
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26	920422105307	22UEE027	YOGAN DHANUSH M	48	40	88
27	920422105304	22UEE028	JOHN RAJ S	43	40	83
28	920422105306	22UEE029	MANI KANDAN K	51	40	91
29	920422105303	22UEE030	JIM ALLEN D J	42	40	82

Register Number	Roll Number	Name of the student	Assessment (60)	Internal (40)	Total (100)
920422105305	22UEE031	JOSHUA RAJ R	49	40	89
920422105301	22UEE032	HARIKUMARAN M	42	40	82
920422105302	22UEE033	HARISH KUMAR V	48	40	88

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