



Indra Ganesan

COLLEGE OF ENGINEERING

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai
Accredited by NAAC with 'B+' Grade, 2(f) & 12B Status Institution by UGC

IG Valley, Madurai Main Road, Manikandam, Tiruchirappalli - 620012

NAAC DOCUMENTS

QUALITY INDICATOR FRAME WORK

CRITERION – 1

CURRICULAR ASPECTS

SUBMITTED BY

IQAC

INTERNAL QUALITY ASSURANCE CELL

INDRA GANESAN COLLEGE OF ENGINEERING





DEPARTMENT OF ELECTRICAL AND ELECTRONIC ENGINEERING

ACADEMIC YEAR 2021-2022 / ODD SEMESTER

1.2 Academic Flexibility (30)

1.2.1 Number of Certificate/Value added courses offered and online courses of MOOCs, SWAYAM, NPTEL etc. (where the students of the institution have enrolled and successfully completed during the last five years)

AND

1.2.2 Percentage of students enrolled in Certificate/ Value added courses and also completed online courses of MOOCs, SWAYAM, NPTEL etc. as against the total number of students during the last five years

VAC Title:	ELECTROCHEMICAL ENERGY STORAGE				
Resource Person:	Mr.R.Durai Raj, Trainer, Startus Electric, Trichy.				
Date of conduct from:	07.03.2022	To:	11.03.2022	Duration:	30 Hours
Organized Department:	ELECTRICAL AND ELECTRONIC ENGINEERING				
Participant Year:	EEE- IV, III, II	Semester:	ODD	No. of Students Registered:	38
Venue:	EEE III Year Class Room.				

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Department of Electrical and Electronics Engineering

Academic Year 2021-2022 –Odd Semester

03.03.2022

DEPARTMENT CIRCULAR

Department of Electrical and Electronics Engineering and IQAC of IGCE in association with Startus Electric is going to organize Value Added Course for all Second, Third and Final year students on “ELECTROCHEMICAL ENERGY STORAGE” from 07.03.22 to 11.03.2022. Certificates will be issued to the eligible participants at the end of the Course. This training is to be provided in our campus.

Resource Person Detail	1. Mr.R.Durai Raj, Trainer, Startus Electric, Trichy.
Venue	EEE III Year Class Room

G. Ma lathu

HOD/EEE

[Signature]
PRINCIPAL

Cc:

- Principal Office
- IQAC Co-Ordinator
- Class In charges - II, III & IV-Year
- II, III & IV-Year EEE Students
- Office File
- Notice Board

[Signature]
Dr. G. Balakrishnan, M.E., Ph.D.,
Principal

Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandam, Trichy-620 012.



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Value Added Course

“ELECTROCHEMICAL ENERGY STORAGE”

SYLLABUS

S.NO	TOPIC COVERED	DURATION (in hours)	DATE
1	Introduction to electrochemical energy storage and conversion	3	07.03.2022
2	Definitions and measuring methods	3	07.03.2022
3	Lithium batteries	3	08.03.2022
4	Basic components in Lithium – ion batteries: Electrodes, Electrolytes, and collectors	3	08.03.2022
5	Characteristics of commercial lithium ion cells	3	09.03.2022
6	Sodium ion rechargeable cell	3	09.03.2022
7	Introduction to battery pack design	3	10.03.2022
8	Advanced materials and technologies for super capacitors	3	10.03.2022
9	Li – Air batteries Li – Sulphur batteries	3	11.03.2022
10	Li resources and recycling of Li ion batteries, Other types of batteries	3	11.03.2022
11	Exam	1	11.03.2022
Total Hours(Excluding Exam)		30	-


VAC Coordinator


Dr. G. Balakrishnan, M.E., Ph.D.,
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HOD/EEE



Value Added Course

Dr. G. Balakrishnan, M.E., Ph.D.,

Principal

Indra Ganesan College of Engineering

IG Valley, Madurai Main Road

Manikandam, Trichy-620 012.

"ELECTROCHEMICAL ENERGY STORAGE"

STUDENTS PARTICIPATION LIST

S.NO	REGISTER NUMBER	NAME	DEPARTMENT
1	811218105001	ARUN PRAVEEN RAJ A	IV/EEE
2	811218105002	HARIHARAN M	IV/EEE
3	811218105003	INBARAJ A	IV/EEE
4	811218105004	JEYA STEPHEN S	IV/EEE
5	811218105005	MANIKANDAN N	IV/EEE
6	811218105006	PADMANABAN A	IV/EEE
7	811218105007	SASIKUMAR R	IV/EEE
8	811218105008	SIVAKUMAR P	IV/EEE
9	811218105009	VEERA RAGAVAN A	IV/EEE
10	811218105010	YUVARAJ S	IV/EEE
11	811219105002	M.BARATH	III/EEE
12	811219105003	A.MANIKANDAN	III/EEE
13	811219105005	C.PONNALAGU	III/EEE
14	811219105006	A.SALAMON	III/EEE
15	811219105007	M.SARAVANAKUMAR	III/EEE
16	811219105008	K.SOLAIMATHI	III/EEE
17	813919105001	P.DHEVENTHIRAN	III/EEE
18	811219105301	A. VENKATRAMAN	III/EEE
19	811220105001	ABINESH T	II/EEE
20	811220105002	ALEX IMMANVEL S	II/EEE
21	811220105006	BALAMURUGAN A	II/EEE



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S.NO	REGISTER NUMBER	NAME	DEPARTMENT
22	811220105011	DIVYA B	II/EEE
23	811220105013	GAYATHRI M	II/EEE
24	811220105017	KARTHIK D	II/EEE
25	811220105019	LATCHIYA K	II/EEE
26	811220105022	MANIKANDAN K	II/EEE
27	811220105023	MOHANDOSS S	II/EEE
28	811220105024	NAVEEN R	II/EEE
29	811220105031	SANDURU K	II/EEE
30	811220105032	SANTHIYA A	II/EEE
31	811220105035	SHANMUGAM S	II/EEE
32	811220105037	SNEKA T	II/EEE
33	811220105038	SOPHIYA K	II/EEE
34	811220105301	AARTHI S	II/EEE
35	811220105303	THIRUNAVUKARASU M	II/EEE
36	811220105305	VENKATESHWARAN.A	II/EEE
37	811220105306	DIVYA BHARATHI	II/EEE
38	811220105307	SATHEESH KUMAR	II/EEE


VAC Coordinator


HOD/EEE


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Manikandam, Trichy-620 012.



Department of Electrical and Electronics Engineering

Academic Year 2021-2022 – Odd Semester

STUDENTS ATTENDANCE LIST

Value Added Course

“ELECTROCHEMICAL ENERGY STORAGE”

Dr. G. Balakrishnan, M.E., Ph.D.,
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 Indra Ganesan College of Engineering
 IG Valley, Madurai Main Road
 Manikandam, Trichy-620 012.

S.NO	Register Number	Name	YEAR/ BRANCH	07.03.2022		08.03.2022		09.03.2022		10.03.2022		11.03.2022		NO OF SESSIONS ATTENDED	SIGNATURE OF THE STUDENT
				FN	AN	FN	AN	FN	AN	FN	AN	FN	AN		
1	811218105001	ARUN PRAVEEN RAJ A	IV/EEE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	A Arun Raj
2	811218105002	HARIHARAN M	IV/EEE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	M. Hariharan
3	811218105003	INBARAJ A	IV/EEE	✓	✓	a	✓	✓	✓	✓	✓	✓	✓	9	Inbaraj
4	811218105004	JEYA STEPHEN S	IV/EEE	✓	✓	✓	✓	✓	a	✓	✓	✓	✓	9	S. Jeya Stephen
5	811218105005	MANIKANDAN N	IV/EEE	✓	✓	✓	✓	✓	✓	✓	a	✓	✓	9	N. Manikandan
6	811218105006	PADMANABAN A	IV/EEE	a	✓	✓	✓	✓	✓	✓	✓	✓	✓	9	A. Padmanaban
7	811218105007	SASIKUMAR R	IV/EEE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	R. Sasikumar
8	811218105008	SIVAKUMAR P	IV/EEE	✓	a	✓	✓	✓	✓	✓	✓	✓	✓	9	P. Sivakumar
9	811218105009	VEERA RAGAVAN A	IV/EEE	✓	✓	✓	a	✓	✓	✓	✓	✓	✓	9	A. Veeragan
10	811218105010	YUVARAJ S	IV/EEE	✓	✓	✓	✓	a	✓	✓	✓	✓	✓	9	S. Yuvaraj
11	811219105002	M.BARATH	III/EEE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	M. Barath
12	811219105003	A.MANIKANDAN	III/EEE	✓	✓	a	✓	✓	✓	✓	✓	✓	✓	9	A. Manikandan
13	811219105005	C.PONNALAGU	III/EEE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	C. Ponnalagu
14	811219105006	A.SALAMON	III/EEE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	A. Salamon

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S.NO	Register Number	Name	YEAR/ BRANCH	07.03.2022		08.03.2022		09.03.2022		10.03.2022		11.03.2022		NO OF SESSIONS ATTENDED	SIGNATURE OF THE STUDENT
				FN	AN	FN	AN	FN	AN	FN	AN	FN	AN		
15	811219105007	M.SARAVANAKUMAR	III/EEE	✓	✓	✓	a	✓	✓	✓	✓	✓	✓	9	Saravanan
16	811219105008	K.SOLAIMATHI	III/EEE	✓	✓	✓	✓	a	a	✓	✓	✓	✓	8	Solaimathi
17	813919105001	P.DHEVENTHIRAN	III/EEE	✓	✓	a	a	✓	✓	✓	✓	✓	✓	8	Dheventhiran
18	811219105301	A. VENKATRAMAN	III/EEE	✓	a	✓	✓	✓	✓	✓	✓	✓	✓	9	Venkatraman
19	811220105001	ABINESH T	II/EEE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	Abinash
20	811220105002	ALEX IMMANVEL S	II/EEE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	Alex Immanuel
21	811220105006	BALAMURUGAN A	II/EEE	✓	✓	✓	✓	✓	✓	✓	a	✓	✓	9	Balamurugan
22	811220105011	DIVYA B	II/EEE	a	✓	✓	✓	✓	✓	✓	a	a	✓	8	Divya
23	811220105013	GAYATHRI M	II/EEE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	9	Gayathri
24	811220105017	KARTHIK D	II/EEE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	Karthik
25	811220105019	LATCHIYA K	II/EEE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	Latchiya
26	811220105022	MANIKANDAN K	II/EEE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	Manikandan
27	811220105023	MOHANDOSS S	II/EEE	✓	a	✓	✓	✓	✓	✓	✓	✓	✓	10	Mohandoss
28	811220105024	NAVEEN R	II/EEE	✓	✓	✓	a	✓	✓	✓	✓	✓	✓	9	Naveen
29	811220105031	SANDURU K	II/EEE	✓	✓	✓	✓	✓	a	✓	✓	✓	✓	9	Sanduru
30	811220105032	SANTHIYA A	II/EEE	✓	✓	✓	✓	✓	✓	✓	a	✓	✓	9	Santhiya
31	811220105035	SHANMUGAM S	II/EEE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	Shanmugam
32	811220105037	SNEKA T	II/EEE	✓	✓	✓	✓	a	✓	✓	✓	✓	✓	9	Sneka
33	811220105038	SOPHIYA K	II/EEE	a	a	✓	✓	✓	✓	✓	✓	✓	✓	8	Sophiya
34	811220105301	AARTHI S	II/EEE	✓	✓	✓	✓	✓	✓	a	✓	✓	✓	9	Aarthi



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				FN	AN	FN	AN	FN	AN	FN	AN	FN	AN		
35	811220105303	THIRUNAVUKARASU M	II/EEE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	M. Thirunavukarasu
36	811220105305	VENKATESHWARAN.A	II/EEE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	9	A Venkateshwaran
37	811220105306	DIVYA BHARATHI	II/EEE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	Divya Bharathi
38	811220105307	SATHEESH KUMAR	II/EEE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	Satheesh Kumar


VAC Coordinator


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HoD/EEE



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Name of the Student:

Year/Sem:

AU Register Number:

Value Added Course

“ELECTROCHEMICAL ENERGY STORAGE”

MULTIPLE CHOICE QUESTIONS (25X1 = 25 Marks)

1. The current flow through electrolyte is due to the movement of

- (A) Ions (B) holes (C) electrons (D) none of the above

2. If a lead-acid cell is discharged below 1.8 V the following will happen.

- (A) Capacity of cell will reduce (C) Internal resistance will increase
(B) Sulphation of plates will occur (D) All above will occur

3. Each cell has a vent cap

- (A) to allow gases out when the cell is on charge (C) to check the level of electrolyte
(B) to add water to the cell if needed (D) to do all above functions

4. Following will occur if level of electrolyte falls below plates

- (A) Capacity of the cell is reduced (C) open plates are converted to lead sulphate
(B) life of the cell is reduced (D) all above

5. Which of the following battery is used for air-craft?


- (A) Lead-acid battery (C) Dry cell battery
(B) Nickel-iron battery (D) Silver oxide battery

6. Cells are connected in parallel to

- (A) Increase the efficiency (C) increase the voltage output
(B) increase the current capacity (D) increase the internal resistance


7. In a battery cover is placed over the element and sealed to the top of the battery container. This is done

- (A) to reduce evaporation of water from electrolyte
(B) to exclude dirt and foreign matter from the electrolyte
(C) to discharge both of the above functions
(D) to discharge none of the above functions


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8. Level of electrolyte in a cell should be _____ the level of plates
(A) Below (B) equal to (C) above (D) none of the above
9. Under normal charging rate, the charging current should be
(A) 10% of capacity (B) 20% of capacity (C) 30% of capacity (D) 40% of capacity
10. Satellite power requirement is provided through
(A) Solar cells (B) dry cells (C) nickel-cadmium cells (D) lead-acid batteries
11. A constant-voltage generator has
(A) Minimum efficiency (C) low internal resistance
(B) minimum current capacity (D) high internal resistance
12. 48 ampere-hour capacity would deliver a current of
(A) 48 amperes for 1 hour (C) 8 amperes for 6 hours
(B) 24 amperes for 2 hours (D) 6 amperes for 8 hours
13. Mercury cell has which of the following characteristics?
(A) Flat discharge current-voltage curve
(B) High power to weight ratio
(C) Comparatively longer shelf life under adverse conditions of high temperature and Humidity
(D) All of the above
14. Which of the following factors adversely affects the capacity of the lead acid battery?
(A) Temperature of surroundings (C) Rate of discharge
(B) Specific gravity of electrolyte (D) All of the above
15. Internal resistance of a cell is reduced by
(A) Using vent plug to permit gas formed during discharge
(B) increasing the plate area
(C) putting plates very close together (D) all above methods
16. Trickle charging of a storage battery helps to
(A) Maintain proper electrolyte level (C) prevent sulphation


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(B) increase its reserve capacity

(D) keep it fresh and fully charged

17. It is noticed that during charging

(A) There is a rise in voltage

(B) energy is absorbed by the cell.

(C) specific gravity of H_2SO_4 is increased

(D) all of the above

18. Which of the following cell has a reversible chemical reaction?

(A) Lead-acid

(B) Mercury oxide

(C) Carbon-zinc

(D) Silver-oxide

19. Batteries are charged by

(A) Rectifiers

(C) motor generator sets

(B) engine generator sets

(D) any one of the above methods

20. Cell short circuit results in

(A) low specific gravity electrolyte

(B) abnormal high temperature

(C) reduced gassing on charge

(D) all above

21. A battery is an arrangement of electrolytic cells.

A) True

B) False

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22. Which of the following is not a requirement for a useful battery?

A) It should be light and compact

B) It should have a reasonable life span

C) It should ideally have a constant voltage throughout its lifespan

D) It should supply Alternating Current(AC)

23. Which of the following statements is true regarding a primary cell?

A) The electrode reactions can be reversed

B) It can be recharged

C) An example of a primary cell is a mercury cell

D) An example of a primary cell is a nickel-cadmium storage cell

24. Which of the following is used as an anode in a dry cell?

A) Zinc

B) Graphite

C) Mercury (II) oxide

D) Nickel

25. Why do leak proof dry cells have an iron or steel sheet covering the zinc cylinder?

A) It increases the potential difference between the anode and cathode

B) It acts as a barrier around the zinc cylinder which can develop holes during use

C) It makes it waterproof

D) It prevents the leakage of current



Value Added Course

“ELECTROCHEMICAL ENERGY STORAGE”

ANSWER KEY

1	A	6	B	11	C	16	D	21	B
2	D	7	C	12	D	17	D	22	D
3	D	8	C	13	D	18	A	23	C
4	D	9	A	14	D	19	D	24	C
5	B	10	A	15	D	20	D	25	B


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VAC Coordinator



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Name of the Student: AARTH.S

Year/Sem: 3/5

AU Register Number: 811220105301

20
25

Value Added Course

“ELECTROCHEMICAL ENERGY STORAGE”

MULTIPLE CHOICE QUESTIONS (25X1 = 25 Marks)

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 (B) increase the current capacity (D) increase the internal resistance

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(D) to discharge none of the above functions


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9. Under normal charging rate, the charging current should be

- (A) 10% of capacity (B) 20% of capacity (C) 30% of capacity (D) 40% of capacity

10. Satellite power requirement is provided through

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(B) Specific gravity of electrolyte (D) All of the above

15. Internal resistance of a cell is reduced by

- (A) Using vent plug to permit gas formed during discharge
(B) increasing the plate area
(C) putting plates very close together (D) all above methods

16. Trickle charging of a storage battery helps to

- (A) Maintain proper electrolyte level (C) prevent sulphation
(B) increase its reserve capacity (D) keep it fresh and fully charged

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandam, Trichy-620 012.




Indra Ganesan

COLLEGE OF ENGINEERING

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17. It is noticed that during charging
- (A) There is a rise in voltage
(B) energy is absorbed by the cell
(C) specific gravity of H_2SO_4 is increased
(D) all of the above
18. Which of the following cell has a reversible chemical reaction?
- (A) Lead-acid
(B) Mercury oxide
(C) Carbon-zinc
(D) Silver-oxide
19. Batteries are charged by
- (A) Rectifiers
(B) engine generator sets
(C) motor generator sets
(D) any one of the above methods
20. Cell short circuit results in
- (A) low specific gravity electrolyte
(B) abnormal high temperature
(C) reduced gassing on charge
(D) all above
21. A battery is an arrangement of electrolytic cells.
- (A) True
(B) false
22. Which of the following is not a requirement for a useful battery?
- (A) It should be light and compact
(B) It should have a reasonable life span
(C) It should ideally have a constant voltage throughout its lifespan
(D) It should supply Alternating Current (AC)
23. Which of the following statements is true regarding a primary cell?
- (A) The electrode reactions can be reversed
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(C) An example of a primary cell is a mercury cell
(D) An example of a primary cell is a nickel-cadmium storage cell
24. Which of the following is used as an anode in a dry cell?
- (A) Zinc
(B) Graphite
(C) Mercury (II) oxide
(D) Nickel
25. Why do leak proof dry cells have an iron or steel sheet covering the zinc cylinder?
- (A) It increases the potential difference between the anode and cathode
(B) It acts as a barrier around the zinc cylinder which can develop holes during use
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Name of the Student: M. BARATH

Year/Sem: IV / VII

AU Register Number: 811219105002

21
25

Value Added Course

“ELECTROCHEMICAL ENERGY STORAGE”

MULTIPLE CHOICE QUESTIONS (25X1 = 25 Marks)

1. The current flow through electrolyte is due to the movement of

- (A) ions (B) holes (C) electrons (D) none of the above

2. If a lead-acid cell is discharged below 1.8 V the following will happen.

- (A) Capacity of cell will reduce (C) Internal resistance will increase
(B) Sulphation of plates will occur (D) All above will occur

3. Each cell has a vent cap

- (A) to allow gases out when the cell is on charge (C) to check the level of electrolyte
(B) to add water to the cell if needed (D) to do all above functions

4. Following will occur if level of electrolyte falls below plates

- (A) Capacity of the cell is reduced (C) open plates are converted to lead sulphate
(B) life of the cell is reduced (D) all above

5. Which of the following battery is used for air-craft?

- (A) Lead-acid battery (C) Dry cell battery
(B) Nickel-iron battery (D) Silver oxide battery

6. Cells are connected in parallel to

- (A) Increase the efficiency (C) increase the voltage output
 (B) increase the current capacity (D) increase the internal resistance

7. In a battery cover is placed over the element and sealed to the top of the battery container. This is done

- (A) to reduce evaporation of water from electrolyte
 (B) to exclude dirt and foreign matter from the electrolyte
 (C) to discharge both of the above functions
(D) to discharge none of the above functions

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8. Level of electrolyte in a cell should be _____ the level of plates

- (A) Below (B) equal to (C) above (D) none of the above

9. Under normal charging rate, the charging current should be

- (A) 10% of capacity (B) 20% of capacity (C) 30% of capacity (D) 40% of capacity

10. Satellite power requirement is provided through

- (A) Solar cells (B) dry cells (C) nickel-cadmium cells (D) lead-acid batteries

11. A constant-voltage generator has

- (A) Minimum efficiency (B) minimum current capacity (C) low internal resistance (D) high internal resistance

12. 48 ampere-hour capacity would deliver a current of

- (A) 48 amperes for 1 hour (B) 24 amperes for 2 hours (C) 8 amperes for 6 hours (D) 6 amperes for 8 hours

13. Mercury cell has which of the following characteristics?

- (A) Flat discharge current-voltage curve
(B) High power to weight ratio
(C) Comparatively longer shelf life under adverse conditions of high temperature and Humidity
(D) All of the above

14. Which of the following factors adversely affects the capacity of the lead acid battery?

- (A) Temperature of surroundings (B) Specific gravity of electrolyte (C) Rate of discharge (D) All of the above

15. Internal resistance of a cell is reduced by

- (A) Using vent plug to permit gas formed during discharge
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Name of the Student:

Naveen. R

Year/Sem:

III / V

AU Register Number:

811220105024

19
25

Value Added Course

“ELECTROCHEMICAL ENERGY STORAGE”

MULTIPLE CHOICE QUESTIONS (25X1 = 25 Marks)

1. The current flow through electrolyte is due to the movement of

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Manikandam, Trichy-620 012.

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Department of Electrical and Electronics Engineering

Academic Year 2021-2022 Odd Semester

VALUE ADDED COURSE ASSESMENT SHEET

“ELECTROCHEMICAL ENERGY STORAGE”

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal

Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandam, Trichy-620 012.

S.NO	Register Number	NAME	YEAR/ BRANCH	Attendance Details		VAC-MCQ TEST		OVERALL MARK (100)
				No. of Hours Attended	Attendance Mark(100) (A)	No of Correct Answers	MCQ Mark(100) (B)	(50% of A + 50% of B)
1	811218105001	ARUN PRAVEEN RAJ A	IV/EEE	30	100	20	80	90
2	811218105002	HARIHARAN M	IV/EEE	30	100	19	76	88
3	811218105003	INBARAJ A	IV/EEE	27	90	19	76	83
4	811218105004	JEYA STEPHEN S	IV/EEE	27	90	21	84	87
5	811218105005	MANIKANDAN N	IV/EEE	27	90	20	80	85
6	811218105006	PADMANABAN A	IV/EEE	27	90	19	76	83
7	811218105007	SASIKUMAR R	IV/EEE	30	100	20	80	90
8	811218105008	SIVAKUMAR P	IV/EEE	27	90	20	80	85
9	811218105009	VEERA RAGAVAN A	IV/EEE	27	90	19	76	83
10	811218105010	YUVARAJ S	IV/EEE	27	90	19	76	83
11	811219105002	M.BARATH	III/EEE	30	100	21	84	92
12	811219105003	A.MANIKANDAN	III/EEE	27	90	20	80	85
13	811219105005	C.PONNALAGU	III/EEE	30	100	21	84	92

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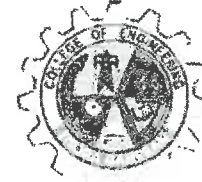
S.NO	Register Number	NAME	YEAR/ BRANCH	Attendance Details		VAC-MCQ TEST		OVERALL MARK (100)
				No. of Hours Attended	Attendance Mark(100) (A)	No of Correct Answers	MCQ Mark(100) (B)	(50% of A + 50% of B)
14	811219105006	A.SALAMON	III/EEE	30	100	22	88	94
15	811219105007	M.SARAVANAKUMAR	III/EEE	27	90	19	76	83
16	811219105008	K.SOLAIMATHI	III/EEE	24	80	20	80	80
17	813919105001	P.DHEVENTHIRAN	III/EEE	24	80	21	84	82
18	811219105301	A. VENKATRAMAN	III/EEE	27	90	22	88	89
19	811220105001	ABINESH T	II/EEE	30	100	20	80	90
20	811220105002	ALEX IMMANVEL S	II/EEE	27	90	21	84	87
21	811220105006	BALAMURUGAN A	II/EEE	24	80	20	80	80
22	811220105011	DIVYA B	II/EEE	27	90	21	84	87
23	811220105013	GAYATHRI M	II/EEE	30	100	20	80	90
24	811220105017	KARTHIK D	II/EEE	30	100	19	76	88
25	811220105019	LATCHIYA K	II/EEE	30	100	22	88	94
26	811220105022	MANIKANDAN K	II/EEE	30	100	21	84	92
27	811220105023	MOHANDOSS S	II/EEE	27	90	20	80	85
28	811220105024	NAVEEN R	II/EEE	27	90	19	76	83
29	811220105031	SANDURU K	II/EEE	27	90	19	76	83
30	811220105032	SANTHIYA A	II/EEE	27	90	21	84	87
31	811220105035	SHANMUGAM S	II/EEE	30	100	20	80	90
32	811220105037	SNEKA T	II/EEE	27	90	19	76	83
33	811220105038	SOPHIYA K	II/EEE	24	80	21	84	82



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S.NO	Register Number	NAME	YEAR/ BRANCH	Attendance Details		VAC-MCQ TEST		OVERALL MARK (100)
				No. of Hours Attended	Attendance Mark(100) (A)	No of Correct Answers	MCQ Mark(100) (B)	(50% of A + 50% of B)
34	811220105301	AARTHI S	II/EEE	27	90	20	80	85
35	811220105303	THIRUNAVUKARASU M	II/EEE	30	100	21	84	92
36	811220105305	VENKATESHWARAN.A	II/EEE	27	90	23	92	91
37	811220105306	DIVYA BHARATHI	II/EEE	30	100	19	76	88
38	811220105307	SATHEESH KUMAR	II/EEE	30	100	20	80	90

VAC Coordinator


Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
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Manikandam, Trichy-620 012.


Ge. Ma Lathi
HOD/EEE



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REPORT ON VALUE ADDED COURSE

Title: "ELECTROCHEMICAL ENERGY STORAGE"

Resource
Persons: Mr.R.Durai Raj,
Trainer,
Startus Electric,
Trichy

Date of conduct from : 07.03.2022 To: 11.03.2022 Duration: 30 Hours

Organized
Department : Electrical and Electronics Engineering

Participant Year: 2,3,4

No. of Students
Registered : 38

Venue: III Year Class Room

Outcome of Value Added Course (VAC): At the end of the Course, Students can able to

- Learn the thermodynamics in electrolyte solutions.
- Learn the concept of the electrochemical cell.
- Learn the most common electrochemical reactions measurement techniques.
- estimate the energy and conversion efficiencies of the energy conversion system
- Understand the need and potential of electrochemical energy storage.

Assessment Process

- Students, who are securing more than 70% on total score and secured more than 75% in attendance is eligible to receive the certificate for the VAC course conducted
- Total Score = $(0.5 * \text{Attendance in VAC out of 100 percentage} + 0.5 * \text{Test mark in VAC out of 100 marks})$

VAC Coordinator

G. Ma Lathu
HOD/EEE

Principal

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal

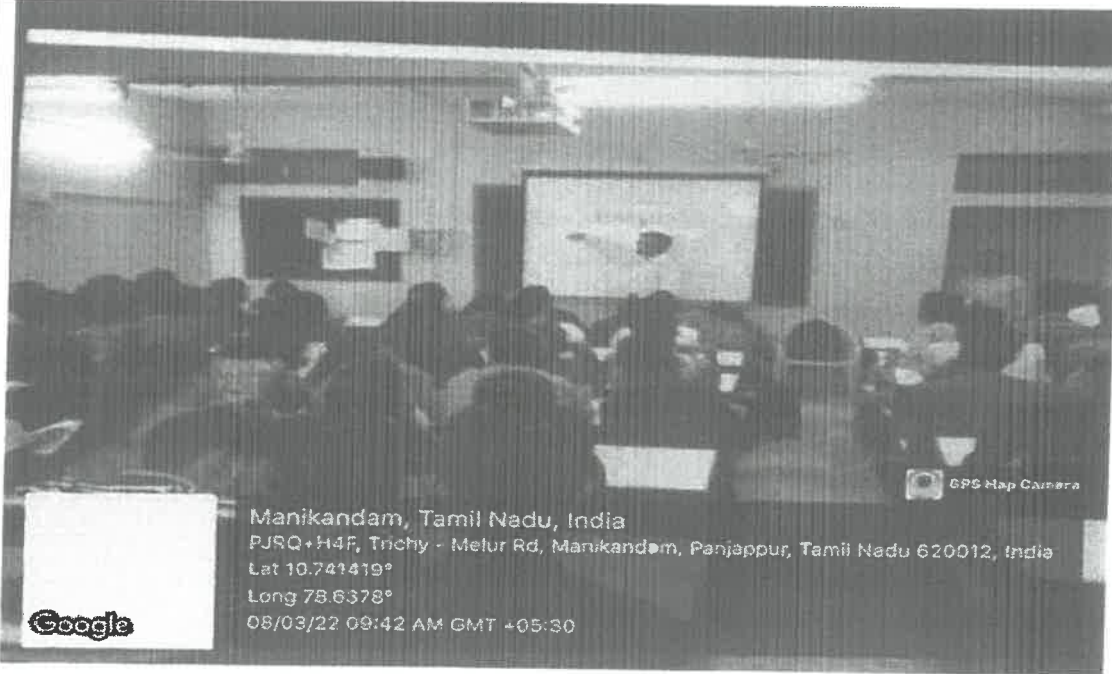
Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
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SAMPLE PHOTO OF VALUE ADDED COURSE

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Organized Department :	Electrical and Electronics Engineering				
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Venue:	EEE III Year Class Room				

SAMPLE PHOTO




VAC Coordinator

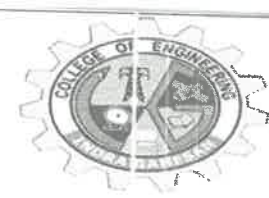

G. Ma Lathi
HOD/EEE


Principal

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CERTIFICATE OF PARTICIPATION

This is to certify that Mr. SASIKUMAR R, IV Year, EEE has successfully completed the Value Added Course on “ELECTROCHEMICAL ENERGY STORAGE” organized by Department of Electrical & Electronics Engineering and IQAC of our Institution in Association with Startus Electric from 7th March 2022 to 11th March 2022 (5days) during the Academic year 2021-2022.

Startus Electric
Mr.C.Premkumar
Chief Executive Officer.

Principal
IGCE

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
Indra Ganesan College of Engineering
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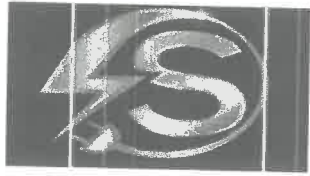
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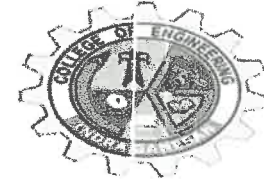


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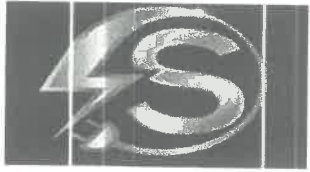
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This is to certify that Mr. A.SALAMON, III Year, EEE has successfully completed the Value Added Course on “ELECTROCHEMICAL ENERGY STORAGE” organized by Department of Electrical & Electronics Engineering and IQAC of our Institution in Association with Startus Electric from 7th March 2022 to 11th March 2022 (5days) during the Academic year 2021-2022.

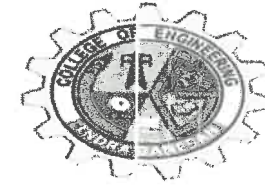
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This is to certify that Ms. K.SOLAIMATHI, III Year, EEE has successfully completed the Value Added Course on “ELECTROCHEMICAL ENERGY STORAGE” organized by Department of Electrical & Electronics Engineering and IQAC of our Institution in Association with Startus Electric from 7th March 2022 to 11th March 2022 (5days) during the Academic year 2021-2022.

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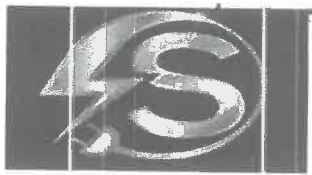
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This is to certify that Mr. P.DHEVENTHIRAN, III Year, EEE has successfully completed the Value Added Course on “ELECTROCHEMICAL ENERGY STORAGE” organized by Department of Electrical & Electronics Engineering and IQAC of our Institution in Association with Startus Electric from 7th March 2022 to 11th March 2022 (5days) during the Academic year 2021-2022.

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This is to certify that Mr. A. VENKATRAMAN, III Year, EEE has successfully completed the Value Added Course on “ELECTROCHEMICAL ENERGY STORAGE” organized by Department of Electrical & Electronics Engineering and IQAC of our Institution in Association with Startus Electric from 7th March 2022 to 11th March 2022 (5days) during the Academic year 2021-2022.

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This is to certify that Mr. ABINESH T, II Year, EEE has successfully completed the Value Added Course on “ELECTROCHEMICAL ENERGY STORAGE” organized by Department of Electrical & Electronics Engineering and IQAC of our Institution in Association with Startus Electric from 7th March 2022 to 11th March 2022 (5days) during the Academic year 2021-2022.

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This is to certify that Ms. SNEKA T, II Year, EEE has successfully completed the Value Added Course on “ELECTROCHEMICAL ENERGY STORAGE” organized by Department of Electrical & Electronics Engineering and IQAC of our Institution in Association with Startus Electric from 7th March 2022 to 11th March 2022 (5days) during the Academic year 2021-2022.

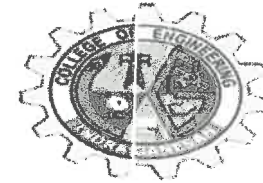
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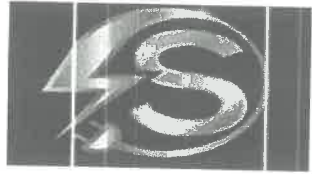
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This is to certify that Mr. BALAMURUGAN A, II Year, EEE has successfully completed the Value Added Course on “ELECTROCHEMICAL ENERGY STORAGE” organized by Department of Electrical & Electronics Engineering and IQAC of our Institution in Association with Startus Electric from 7th March 2022 to 11th March 2022 (5days) during the Academic year 2021-2022.

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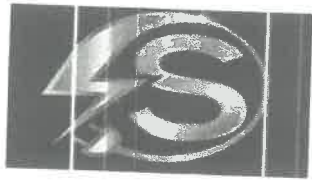
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This is to certify that Ms. GAYATHRI M, II Year, EEE has successfully completed the Value Added Course on “ELECTROCHEMICAL ENERGY STORAGE” organized by Department of Electrical & Electronics Engineering and IQAC of our Institution in Association with Startus Electric from 7th March 2022 to 11th March 2022 (5days) during the Academic year 2021-2022.

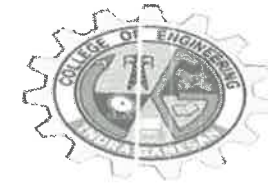
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This is to certify that Mr. MOHANDOSS S, II Year, EEE has successfully completed the Value Added Course on “ELECTROCHEMICAL ENERGY STORAGE” organized by Department of Electrical & Electronics Engineering and IQAC of our Institution in Association with Startus Electric from 7th March 2022 to 11th March 2022 (5days) during the Academic year 2021-2022.

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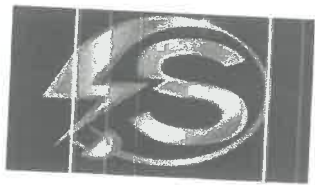
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This is to certify that Ms. AARTHI S, II Year, EEE has successfully completed the Value Added Course on “ELECTROCHEMICAL ENERGY STORAGE” organized by Department of Electrical & Electronics Engineering and IQAC of our Institution in Association with Startus Electric from 7th March 2022 to 11th March 2022 (5days) during the Academic year 2021-2022.

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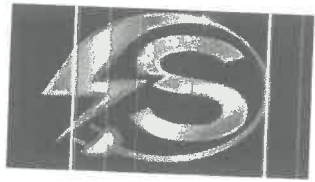
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This is to certify that Mr. PADMANABAN A, IV Year, EEE has successfully completed the Value Added Course on “ELECTROCHEMICAL ENERGY STORAGE” organized by Department of Electrical & Electronics Engineering and IQAC of our Institution in Association with Startus Electric from 7th March 2022 to 11th March 2022 (5days) during the Academic year 2021-2022.

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This is to certify that Mr. MANIKANDAN N, IV Year, EEE has successfully completed the Value Added Course on “ELECTROCHEMICAL ENERGY STORAGE” organized by Department of Electrical & Electronics Engineering and IQAC of our Institution in Association with Startus Electric from 7th March 2022 to 11th March 2022 (5days) during the Academic year 2021-2022.

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This is to certify that Mr. HARIHARAN M, IV Year, EEE has successfully completed the Value Added Course on “ELECTROCHEMICAL ENERGY STORAGE” organized by Department of Electrical & Electronics Engineering and IQAC of our Institution in Association with Startus Electric from 7th March 2022 to 11th March 2022 (5days) during the Academic year 2021-2022.

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This is to certify that Mr. ARUN PRAVEEN RAJ A, IV Year, EEE has successfully completed the Value Added Course on “ELECTROCHEMICAL ENERGY STORAGE” organized by Department of Electrical & Electronics Engineering and IQAC of our Institution in Association with Startus Electric from 7th March 2022 to 11th March 2022 (5days) during the Academic year 2021-2022.

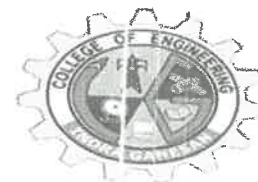
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This is to certify that Mr. INBARAJ A, IV Year, EEE has successfully completed the Value Added Course on “ELECTROCHEMICAL ENERGY STORAGE” organized by Department of Electrical & Electronics Engineering and IQAC of our Institution in Association with Startus Electric from 7th March 2022 to 11th March 2022 (5days) during the Academic year 2021-2022.

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